B.Sc. Fire & Industrial Safety 4-year course

PPR (Programme Project Report)

<table>
<tr><td colspan="2">Name of Programme:- B.Sc. in Fire & Industrial Safety (4 year Course)</td></tr>
<tr><td>Year</td><td>2025-2026</td></tr>
<tr><td>Date of Approval of PPR</td><td>28/03/2025</td></tr>
<tr><td>Upload of PPR</td><td></td></tr>
<tr><td>Upload Approval of PPR</td><td></td></tr>
<tr><td>Expected outcome</td><td></td></tr>
<tr><td>Whether Programme Project Report (PPR) prepared for the Programme and approved as per Regulation 13 and Annexure V of UGC (ODL Programmes and Online Programmes) Regulations, 2020 (Attached PPR)</td><td></td></tr>
<tr><td colspan="2">Whether HEI compliance to following provision for the Programme Project Report (PPR) as per Annexure V of UGC (ODL Programmes and Online Programmes) Regulations, 2020:</td></tr>
<tr><td>Programme’s mission & objectives</td><td>(See clause (i) of sub-regulation (2) of Regulation 11 of the University Grants
Commission (Open and Distance Learning) Regulations, 2017 dated 23rd June,
2017)
This document shall begin with definition of the mission statement and objectives
for the program to be launched. It shall reflect the strategic direction and the
academic goals of the YCMOU. Those shall be aligned with industrial or learners’
demand, and shall be defined in such a manner that they are appropriate to be
achieved.

Mission Statement:

The mission of the B.Sc. Fire and Safety program is to equip students with comprehensive knowledge, practical skills, and professional ethics required for fire prevention, risk assessment, emergency response, and industrial safety. The program aims to develop competent safety professionals who can effectively manage fire hazards, ensure workplace safety, and contribute to community resilience in emergencies.

Program Objectives:

The key objectives of the program are:</td></tr>
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	1. **Fundamental Knowledge** – Provide a strong foundation in fire science, safety engineering, and risk management principles. 2. **Fire Prevention & Control** – Train students in fire prevention strategies, firefighting techniques, and emergency response protocols. 3. **Industrial & Occupational Safety** – Educate students on workplace safety regulations, hazard analysis, and safety management systems in industries. 4. **Disaster Management** – Prepare students to handle emergency situations such as natural disasters, explosions, and hazardous material incidents. 5. **Regulatory Compliance** – Familiarize students with national and international fire and safety standards, laws, and best practices. 6. **Practical Training** – Enhance hands-on skills through live demonstrations, simulations, and internships in firefighting and safety management. 7. **Leadership & Communication** – Develop leadership, teamwork, and communication skills necessary for coordinating safety operations effectively. 8. **Research & Innovation** – Encourage research in fire safety technologies, risk assessment methodologies, and sustainable safety practices.
Relevance of the program with HEI's Mission and Goals	*(See clause (ii) of sub-regulation (2) of Regulation 11 of the University Grants* *Commission (Open and Distance Learning) Regulations, 2017 dated 23rd June,* *2017)* *The YCMOU shall plan for such a program to be offered through the Open and* *Distance Learning mode that is relevant to the YCMOU's mission and goals.* *Therefore, it is very much important that the program to be offered through Open* *and Distance Learning should be aligned with YCMOU's mission and goal and will* *prove as major contributing factor in its achievement.* Objects of the YCMOU (as per the YCMOU Act) which would be fulfilled by implementing the proposed program **To provide flexible and open learning opportunities** • The program allows working professionals and aspiring students from various backgrounds to access specialized education in fire and safety through flexible modes. **To make higher education available to large segments of the population** • The course caters to students in rural, semi-urban, and underserved regions, promoting inclusive and accessible education in a critical field. **To promote vocational and professional education** • Being a skill-based program, it directly supports YCMOU's goal of offering professional and job-oriented education in

	high-demand sectors like industrial safety and disaster management. **To relate higher education to the needs of the economy** • The program addresses the growing need for trained safety professionals in industrial sectors, aligning education with national economic and infrastructure development goals. **To promote the development of skilled manpower** • The course builds competencies in fire safety, risk assessment, emergency response, and safety auditing, contributing to a skilled and safety-conscious workforce. **To provide continuing education and training** • The program supports lifelong learning for professionals already working in fire safety or related fields, aiding in upskilling and career advancement. **To contribute to the cause of national development** • By creating safety professionals capable of minimizing industrial accidents and disasters, the program supports broader national goals of sustainable and safe development. **To enhance research in emerging fields** • The course promotes applied research in fire dynamics, safety technology, and disaster risk reduction, aligning with the university's mission to foster innovation. **To promote self-employment and entrepreneurship** • Graduates may start their own safety consultancy services, fire protection equipment supply businesses, or training institutions, contributing to entrepreneurship. **To establish linkages with industries and professional bodies** • The program facilitates collaboration with safety councils, industries, fire departments, and government bodies, supporting YCMOU's objective of industry-academia integration.
Nature of prospective target group of learners	(See clause (iii) of sub-regulation (2) of Regulation 11 of the University Grants Commission (Open and Distance Learning) Regulations, 2017 dated 23rd June, 2017) The YCMOU shall identify the target group of learners. It is required to understand their learning needs and on its basis the curriculum should be aimed. The YCMOU should also consider diverse class of learners including a class having of low level of disposable income, rural dwellers, women, unskilled men, *minorities etc.* The target group for the program consists of the persons who have successfully completed 12 years of schooling (that is, 12th passed or equivalent). However, considering the mission of YCMOU to provide education with equity and access to disadvantaged classes of the society, the Preparative Program with an age of 21 years as per the UGC Notification for Distance Education 1984. The target group is keen to study the domain area. There is a provision of laboratory component which is tailor-made as per the industry requirements. They may be

<table>
<tr><td></td><td>willing to work at the industry.</td></tr>
<tr><td>Instructional Design</td><td>(See clause (i) of sub-regulation (2) of Regulation 11 of the University Grants
Commission (Open and Distance Learning) Regulations, 2017 dated 23rd June,
2017)
Instructional Design includes Curriculum design, detailed syllabi, duration of the program, faculty and support staff requirement, instructional delivery mechanisms, identification of media – print, audio or video, online, computer aided, and student support service systems. The YCMOU shall define the instructional design for each of the academic programs to be offered through the Open and Distance Learning mode and shall map the credit hours for each course
or module of the program.</td></tr>
<tr><td>Procedure for admissions, curriculum transaction and evaluation</td><td>(See clause (vi) of sub-regulation (2) of Regulation 11 of the University Grants
Commission (Open and Distance Learning) Regulations, 2017 dated 23rd June,
2017)
The YCMOU shall define the admission policy for the program with minimum
eligibility and fee structure. The information related to financial assistance, if
any, should be included in the policy. The YCMOU shall notify the policy of
program delivery along with the details of methods and web-based tools to be
adopted. The YCMOU shall notify the activity planner including all the academic
activities to be carried out by the YCMOU during the academic session. Further,
the YCMOU shall also notify policy for evaluation of learner progress along with
methods and tools.</td></tr>
<tr><td>Requirement of the laboratory support and Library Resources</td><td>(See clause (vii) of sub-regulation (2) of Regulation 11 of the University Grants
Commission (Open and Distance Learning) Regulations, 2017 dated 23rd June,
2017)
There may be programs having practical component in syllabus. The YCMOU shall
give clear guidelines about the laboratory support to the learners to perform the
practical prescribed in the program. There shall be provision of a practical’s book
for the learners. In case of online learning, the practical should be conducted and
performed by applying virtual reality methods.
<u>A. Trainees Tool Kit</u>
<table>
<tr><td>Name of Equipment</td><td>Specification</td><td>Quantity</td></tr>
<tr><td>Water CO_2 Type Fire Extinguisher</td><td>9 Liters</td><td>2 Nos.</td></tr>
<tr><td>Stored Pressure Type Fire Extinguisher</td><td>9 Liters</td><td>8 Nos.</td></tr>
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Chemical Foam Type Fire Extinguisher	9 Liters	2 Nos.
Mechanical Foam Type Fire Extinguisher	9 Liters	8 Nos.
CO_2 Type Fire Extinguisher	4.5 Kg	8 Nos.
BC Type Fire Extinguisher	5/10 Kg	2 Nos.
ABC Type Fire Extinguisher	5/10 Kg	8 Nos.
Extension Ladder	45/35 ft.	2 Nos.
All types of Branches or Nozzles		4 Nos.
Fire Hose	15m, 30m	12 + 5 Nos.

B. Shop Tools & Instruments

Name of Equipment	Specification	Quantity
First Aid Box	-	1 no.
Small Fire Gears (Axe, Crowbar, Torch, etc.)	-	1 no.
BA Set	Negative & Positive Pressure	2 No.
Gas Cylinders + Steel Back Plates + Face Masks	-	2 Each
Portable Fire Pump/TFP	-	2 No.
Fire Couplings (all types)	-	1 Set
Hydrant – Stand Pipe with Flange Type	-	2 No.
Fire Trays	-	2 No.
Manual Call Point	-	1 No.
Proximity/Entry Suit	-	2 No.
Hose Reel System	-	1 No.
Nitrogen Cylinder	-	1 No.
Hose Box	-	1 No.
Fire Fighting Point (complete set)	-	1 No.
Suction Hose + Wrench + Strainer	10 ft / 2 Nos. / 2 + 1 Nos.	See values
Sprinklers (Bulb & Fusible Link Types)	-	2 Nos.
Ropes + Lines	100 ft. Long	1 Each
Control Panel	Model-Pump	1 No

C. Personal Protective Equipment (PPE) - Safety Gear

Name of Equipment	Specification	Quantity
Helmet	Type A, B, C	3 Nos.
Laser Welding Safety Goggles	-	1 No.
Face Shield	-	1 No.
Welding Shield	-	1 No.
Ear Muff	-	1 No.
Ear Plug	-	1 No.
Canal Caps	-	1 No.
Safety Shoes	-	1 No.
Asbestos Gloves	-	1 No.

Electrical Hand Gloves	-	1 No.
Rubber Hand Gloves	-	1 No.
Dust Mask	-	1 No.

C. Personal Protective Equipment (PPE) - Safety Clothing

Name of Equipment	Specification	Quantity
Safety Shirt	-	1 No.
Safety Trouser	-	1 No.
Safety Jacket	-	1 No.
Cooling Vest	-	3 Nos.
Gum Boots	-	1 No.

D. Equipment & Advanced Tools

Name of Equipment	Specification	Quantity
Personal Fall Arrest System (PFAS)	-	2 Nos.
Tripod + Pulley + Suspended Scaffold	-	2 Each
Gas Detector	-	2 Nos.
Plastic Tunnel (Sewer Rescue Drill)	-	4 Nos.
Body Harness	-	1 No.
Breeching (Collecting + Dividing)	-	2 Each
Hydrant Flange	-	2 Nos.
Hydrant Key & Bar with Spindle	-	1 No.
Adaptor for Air Store Pressure	-	1 No.
Hydraulic Pressure Testing Machine	-	1 No.
Salvage Equipment Set	-	Each
Safety Belt	-	4 Nos.

E. ICT and Electronics

Name of Equipment	Specification	Quantity
Desktop Computers	-	8 Nos.
Computer Tables + Chairs	-	8 Each
White Board	-	1 No.
LCD Projector	-	1 No.
UPS	-	As Required
All types of Detectors	-	5 Nos.
Flux Meter	-	5 Nos.
Dosi Meter	-	1 No.
Fire Equipment Cut Models	-	2 Nos.

F. Vehicles and Robotic Fire Equipment

Name of Equipment	Specification	Quantity
Fire Suit	-	2 Nos.
Fire Tender (for institute)	-	1 No.
Rescue Van (for institute)	-	1 No.
Fire Extinguisher Ball	-	4 Nos.
Fire Extinguishing Robot	-	1 No.

Fire Extinguisher Drone	-	1 No.
Automatic Modular Fire Extinguisher	-	1 No.
Safety Harness	-	3 Nos.

G. Furniture and Fixtures

Name of Equipment	Specification	Quantity
Instructor's Table	-	1 No.
Instructor's Chair	-	2 Nos.
Metal Rack	100×150×45 cm	4 Nos.
Lockers (16 drawers)	Standard Size	2 Nos.
Steel Almirah	2.5×1.2×0.5 m	2 Nos.
Blackboard/Whiteboard	-	1 No.

LIABRARY

Chair 30
02 Reading Table 06
03 Book Case 05
04 Multimedia Educational CD's
05 Magazines International & Domestics 02 Each
06 Newspaper – Local & National
07 Computer with Internet Facility 04

TEACHING AIDS

Overhead Projectors 01
02. Color Television 01
03. D. V. D. Player 01
04. L.C. D. Player 01
05. Black Board Each Classroom

Cost estimate of the programme and the provisions	Total ₹ 6,12, 48500 for all 30 Courses at 08 Semesters. **As per the approved University Budget for resp financial years.**
Quality assurance mechanism and expected programme outcomes	*(See clause (ix) of sub-regulation (2) of Regulation 11 of the University Grants Commission (Open and Distance Learning) Regulations, 2017 dated 23rd June, 2017)* *The YCMOU shall define the review mechanism for program and continuously enhance the standards of curriculum, instructional design relevant to professional requirements of the area of study. There should be course benchmark statements.* *The YCMOU shall also devise the mechanism for monitoring effectiveness of the program.* The University will review the program based on four Key Result Areas (KRAs): i. Enrolment of student(to assess the achievement of program based on access and equity

	objects of the YCMOU) ii. Examination Results iii. Placements/satisfaction of passing out students iv. Academic and Administrative feedback from the stakeholders to evaluate the program **based on process and result criteria**
Appropriateness of programme to be conducted in Open and Distance Learning mode to acquire specific skills and competence	B.Sc. Fire & Industrial Safety programme use the Blended Mode of Education, that is, where theory component of teaching learning is offered in online / distance mode and practical activity component of teaching-learning is offered in full face-to face mode under guidance and supervision of qualified and experienced teacher at study centre. Hence, this programme is appropriate to conduct in Open and Distance Learning mode to acquire specified skills and competence. Students will be engaged throughout the entire safety management lifecycle—from hazard identification and risk assessment to prevention planning and emergency response—equipping them for employability in three primary sectors: education and training, safety and emergency services, and research & development in fire and industrial safety."

DEB-UGC application for Programme approval for AY 2025-26

School of Sciences, YCMOU Nashik
(Formerly School of Architecture, Science and Technology)

Programme Project Report (PPR)
4 Year B.Sc. (Honours) (Environmental Science)

A. **Programme Project Report (PPR)**

Name of Programme: B.Sc. (Honours) (Environmental Science)		
a	Programme's mission & objectives	**Mission**: The "Bachelor of Science (Honours)" is an innovative programme based on a number of core, elective and skill courses in Environmental Science. Upon graduation, the learners will be able to understand and appreciate the impact of "Environmental Science" in day-to-day life. Further, the learners will be exposed to the current trends in research about "Environmental Science". The mission is to forge a solid foundation in Environmental Science, empowering learners to confidently tackle and analyze complex scientific challenges with ease. This program aims to cultivate strong analytical skills to prepare learners to excel in the field of Environmental Science. The program provides a comprehensive education in both theoretical and experimental skills of Environmental Science. Learners will engage in hands-on laboratory activities and immersive field projects or internships, ensuring they acquire not only fundamental knowledge but also practical skills vital for success in the scientific community. **Objectives**: The main objectives for offering this programme, are • Interdisciplinary Competence: To provide students with a strong foundation in the courses Environmental Science, fostering interdisciplinary knowledge and skills. • Deep Understanding: To ensure that students gain a deep understanding of the fundamental principles and concepts in Environmental Science. • Problem-Solving Abilities: To equip students with problem-solving skills, enabling them to apply scientific methodologies to address complex issues that require expertise in both disciplines. • Laboratory Proficiency: To develop practical laboratory skills, enabling students to design experiments, collect data, and analyze results in both Environmental Science. • Research Aptitude: To nurture research aptitude by encouraging students to engage in interdisciplinary research projects at the undergraduate level. • Effective Communication: To enhance communication skills, allowing students to communicate scientific findings effectively, both in writing and orally. • Flexibility and Adaptability: To prepare students for diverse career opportunities, including academia, research, industry, and entrepreneurship, by offering a versatile skill set. The flexibility of learning through accessible and cost effective way will be provided through Open and Distance Learning (ODL). • Awareness of Contemporary Issues: To create awareness of contemporary scientific issues, including environmental sustainability, emerging technologies, and societal relevance.
b	Relevance of the Programme with HEI's Mission and Goals	Objects of the YCMOU (as per the YCMOU Act) which would be fulfilled by implementing the proposed program (a) To provide through instruction, teaching and training and other educational opportunities, access to larger and larger segment of population, and in particular to the disadvantaged groups such as those living in remote and rural areas including working people, housewives and other adults who

		wish to upgrade or acquire knowledge through studies in various fields; [1(a)] (b) To strengthen and diversify the degrees, diploma and certificate courses at various educational levels, to fulfill the knowledge, skills and development needs of the individuals, institutions and society in general, by relating, particularly, the courses, to the needs of the employment and economic development of the state on the basis of its natural and human resources; [1(b)] (c) To promote acquisition of knowledge in a rapidly developing and changing society and to continually offer opportunity of upgrading knowledge, training and skills in the context of innovations, research and discovery in all field of human endeavor by developing educational network with the use of modern communication media and technologies appropriate for a learning society; [1(c)] (d) To provide an innovative system of University level education, flexible and open, in regard to the methods and pace of learning, combination of courses, eligibility for enrollment, age of entry, conduct of examinations and operation of the program, with a review to promote learning and encourage excellence in all fields of knowledge; [1(d)] (e) To contribute to the improvement of the education system in the state by providing a non-formal channel complementary to the formal system and encouraging transfer of credits and exchange of teaching staff by making a wide use of text and other software developed by the University; [1(e)] (f) To develop innovative, need based Vocational courses and establish industry, institution linkage for developing the society; [1(f)] (g) To provide through incidental and non-formal means, for continuing and extension of education in various cultural forms, arts, crafts and skills of the country, raising their quality and improving their availability to the people; [1(g)] (h) To provide for the counseling and guidance to its learners; [1(j)] (i) To provide major part of its resources and direct efforts in designing, developing and offering need-based and relevant vocational courses. [1(l)]
c	Nature of prospective target group of learners	A candidate who has passed Standard 12th / (10+2)th / Level 4.0 examination conducted by Maharashtra State Board of Secondary and Higher Secondary Education/CBSE/ ISC/NIOS or equivalent examinations by any Other State or any other recognised Board with science subjects. OR A candidate who has passed (10+3) years or (12+2) years Diploma from Maharashtra State Technical Board / a statutory or recognized board/ university in India. OR A candidate who has passed Higher Secondary School Certificate (10+2) Examination with English and any of the following +2 Level HSC Vocational (MCVC) Group: Horticulture (KA, KB, KC) Crop Science (LA, LB, LC) Animal Husbandry and Dairy Technology (MA, MB, MC) Fisheries Technology (NA, NB, NC)

		Catering and Food Products Technology (SA, SB, SC) Child, Old Age and Health care services (QA, QB, QC) Although similar UG Programme are offered by conventional institutes, the conventional educational system offers very little freedom to learners as regards when, where, and how to learn. The proposed programme aims to provide this freedom to learners to the maximum possible extent.
d	Appropriateness of programme to be conducted in Open and Distance Learning mode to acquire specific skills and competence Specify the expected learning outcomes in terms of: 1. Knowledge Attainment: 2. Skills and Competencies: Compliances of academic, professional & occupational standards:	The proposed programme is designed in adherence to the principles of National Education Policy (NEP2020) to acquire knowledge and skills with valuable experiences through VSC, SEC, AEC, VEC, IKS, hands-on activities, projects, internships and much more. This aims to provide relevant skills as needed by the working professional to identify and solve challenging problems in Environmental Science, thus contributing to the ever-increasing demands of society and industry. The programme helps to develop scientific tempers and attitudes, which in turn can prove beneficial for society since scientific developments can make a nation or society grow at a rapid pace. After studying this programme, learners will be better equipped to learn and have a deep understanding of key concepts of Environmental Science with their principles and theories relevant to the field. It also helps to analyze prepare the leadership roles in governmental agencies, research institutions, and industries related to Environment protection. This programme uses the Open and Distance (ODL) mode of education in compliance with the objective 'reach the unreached' by offering: Theory, Practical, Term-work, Field Project/OJT, courses. The teaching-learning component is offered as face-to-face counseling along with full practical and project-work activities by qualified and experienced teacher/ mentors/experts at a recognized Learner Support Center (LSC), along with continuous assessment, and offline materials and resources in printed book format or soft copy format. The UGC recently introduced a 'virtual laboratory' approach for practical courses. This university is currently working on implementing this for the proposed laboratory activities in science courses. Additionally, this programme adheres all of the prevalent academic norms and standards of the UGC-DEB. Hence, this programme is appropriate to conduct in open and distance learning modes to provide an opportunity for those aspirants who cannot take traditional education but want to improve their existing science skills and/or to acquire specified skills and competencies.
e	Instructional Design **1.** Curriculum Design **(*Outcome of Expert Committee meeting; Program Structure: specify the theory, practical, fieldwork, project, etc components*):** **2.** Total Credit Points (*including course wise*): **3.** Detailed Syllabi: **4.** Duration of the program **(*Minimum & Maximum*):** **5.** Medium of	This B.Sc. (Honours) programme for undergraduates is well structured based on the NEP 2020 framework. The entire curriculum is well organized and thoughtfully designed, featuring an updated syllabus. The four-year B.Sc. (Honours) program consists of 176 credits distributed over eight semesters, with learners required to complete 22 credits in each semester. The modular structure of the curriculum allows for multiple entry and exit options. After successfully completion of 1 to 6 semesters, learners will be awarded a three-year Bachelor of Science (B.Sc.) degree with 132 credits. These credits will be distributed among Major Courses (DSC & DEC)), Minor courses, Open Electives (OEs), Ability Enhancement Courses (AEC), Skill Enhancement Courses (SEC), Value Education Courses (VEC), Indian Knowledge System (IKS), On Job Training (OJT), Field projects(FP), Co-curricular Courses (CC), Research Methodology (RM) etc. Among all offered courses, learners have to opt the courses as per NEP2020 guidelines. **Semester pattern:** This programme is of total 8 semesters. Distribution of the credits are as follows :

Instruction:

6. Type of Program (***General/Technical/ Professional***)**:**
7. Faculty and Support Staff:
8. Instructional Design & Delivery Mechanism (***Media to be used - print, audio, video, online, computer aided, web based, etc. (course wise)***)**:**

Student Support Service System (***Specify the provisions to be made at Head Quarter, Regional Centers, Learner Support Centers and Web based, etc***)**:**

Sem	Mandatory Courses (DSC)				Elective Courses (DSE) (4 CR)	Minor Courses (2CR)		Open Elective OE (2CR)	VSC, SEC (VSEC) (2 CR)		AEC, VEC, IKS (T)		OJT, FP, CEP, CC (2/4 CR)	Total Courses (CR)
	Theory (T)		Practical (P)											
	4 CR	2 CR	4 CR	2 CR		T	P	T	T	TW/P	2 CR	4 CR		
I	1	-	-	1	-	-	-	2	-	2	1	1	CC–1 (2CR)	9 (22 CR)
II	1	-	-	1	-	1	-	2	-	2	-	1	CC–1 (2CR)	9 (22 CR)
Cum Cr.	12				00	02		08	08		10		04	44
Exit option: Award of UG Certificate Environmental Science as Major with 44 credits and an additional 4 credits core NSQF course/ Internship OR Continue with Major and Minor														
III	1	1	-	1	-	1	1	1	-	1	1		FP (2 CR) CC-3 (2CR)	10 (22 CR)
IV	1	1	-	1	-	1	1	1	1	-	1		CEP (2 CR) CC–4 (2CR)	10 (22 CR)
Cum Cr.	28				00	10		12	12		14		12	88
Exit option: Award of UG Diploma in Environmental Science as Major and Minor in XXX with 88 credits and an additional 4 credits core NSQF course/ Internship OR Continue with Major and Minor														
V	1	1	1	-	1	1	1	-	-	1	-		FP/ CEP (2 CR)	8 (22 CR)
VI	1	1	1	-	1	1	1	-	-	-	-		OJT (4CR)	7 (22 CR)
Cum Cr.	48				08	18		12	14		14		18	132
Exit option: Award of UG Degree in Environmental Science as Major with 132 credits OR Continue with Major and Minor														
VII	2	1	1	-	1	1 (4 CR)		-	-		-		-	6 (22 CR)
VIII	2	1	1	-	1	-		-	-		-		OJT (4CR)	6 (22 CR)
Cum Cr.	76				16	22		12	14		14		22	176
Four Year UG Honours Degree in Major in Environmental Science and Minor in XXX with 176 credits														

Programme Structure:

SN	Course	Code	Name	CA	EE	TM	Type	CR	Min %
Semester I									
01	DSC	EVSC101	Ecology and Ecosystem	30	70	100	T	4	40%
02	DSC	EVSC102	Lab Activities on EVSC101	25	25	50	P	2	40%
03	OE	OE101	Select from other faculty OE courses List	15	35	50	T	2	40%
04	OE	OE102	Select from other faculty OE courses List	15	35	50	T	2	40%
05	VSC	EVSV101	Environmental Microbiology	25	25	50	TW	2	40%
06	SEC	SECS101	Basic Instrumentation Skills	25	25	50	TW	2	40%
07	VEC	VECD101	Environmental Education	30	70	100	T	4	40%
08	IKS	IKSK101	Generic IKS	15	35	50	T	2	40%

09	CC	CCRX101	Select from List	25	25	50	TW	2	40%
Semester II									
10	DSC	EVSC103	Environmental Chemistry & Physics	30	70	100	T	4	40%
11	DSC	EVSC104	Lab Activities on EVSC103	25	25	50	P	2	40%
12	Minor	Minor	To be selected from Minor Courses List other than Major (DSC)	15	35	50	T	2	40%
13	OE	OE103	Select from other faculty OE courses List	15	35	50	T	2	40%
14	OE	OE104	Select from other faculty OE courses List	15	35	50	T	2	40%
15	VSC	EVSV102	Introduction to Environmental Audit	25	25	50	TW	2	40%
16	SEC	SECS102	MS Excel with AI	25	25	50	TW	2	40%
17	AEC	AECL101	English Communication	30	70	100	T	4	40%
18	CC	CCRX102	Yoga	25	25	50	TW	2	40%
Exit option: Award of UG Certificate in ENVIRONMENTAL SCIENCE as Major with 44 credits and an additional 4 credits core NSQF course/Internship OR Continue with Major and Minor									
Semester III									
19	DSC	EVSC201	Biodiversity Conservation	30	70	100	T	4	40%
20	DSC	EVSC202	Environment: Indian Culture & Traditions	15	35	50	T	2	40%
21	DSC	EVSC203	Lab Activities on EVSC201	25	25	50	P	2	40%
22	Minor	Minor	To be selected from Minor Courses List other than Major (DSC)	15	35	50	T	2	40%
23	Minor	Minor	To be selected from Minor Courses List other than Major (DSC)	25	25	50	P	2	40%
24	OE	OE201	Select from other faculty OE courses List	15	35	50	T	2	40%
25	VSC	EVSV201	Soil Health Management	25	25	50	P	2	40%
26	AEC	AECL201	Modern Indian language – I	15	35	50	T	2	40%
27	FP	EVSF201	Field Project	25	25	50	TW	2	40%
28	CC	CCRX201	Select from List	25	25	50	TW	2	40%
Semester IV									
29	DSC	EVSC205	Pollution Control	30	70	100	T	4	40%

			Technologies							
30	DSC	EVSC206	Natural Resource Management	15	35	50	T	2	40%
31	DSC	EVSC207	Lab Activities on EVSC205	25	25	50	P	2	40%
32	Minor	Minor	To be selected from Minor Courses List other than Major (DSC)	15	35	50	T	2	40%
33	Minor	Minor	To be selected from Minor Courses List other than Major (DSC)	25	25	50	P	2	40%
34	OE	OE202	Select from other faculty OE courses List	15	35	50	T	2	40%
35	SEC	SECS201	Intellectual Property Rights	15	35	50	T	2	40%
36	AEC	AECL202	Modern Indian language – II	15	35	50	T	2	40%
37	CEP	EVSG208 (CEPG201)	Select from List	25	25	50	TW	2	40%
38	CC	CCRX202	Select from List	25	25	50	TW	2	40%
Exit option: Award of UG Diploma in Major in Environmental Science and XXX Minor as per selection with 88 credits and an additional 4 credits core NSQF course/ Internship OR Continue with Major and Minor									
Semester V									
39	DSC	EVSC301	Environment Legislation & Audit	30	70	100	T	4	40%
40	DSC	EVSC302	Environment Impact Assessment	15	35	50	T	2	40%
41	DSC	EVSC303	Lab Activities on EVSC301, EVSC302 & Elective	50	50	100	P	4	40%
Select Any One from EVSC304, EVSC305, EVSC306									
42	DSE	EVSC304	Environmental Geosciences	30	70	100	T	4	40%
	DSE	EVSC305	Alternate Energy Resources	30	70	100	T	4	40%
	DSE	EVSC306	Urban Ecosystem & Sustainable Development	30	70	100	T	4	40%
43	Minor	Minor	To be selected from Minor Courses List other than Major (DSC)	15	35	50	T	2	40%
44	Minor	Minor	To be selected from Minor Courses List other than Major (DSC)	25	25	50	P	2	40%
45	VSC	EVSV301	Basics of EMS	25	25	50	TW	2	40%
Select EVSF307 or EVSG308									
46	FP	EVSF307	Field Project	25	25	50	TW	2	40%
	CEP	EVSG308	Awareness of Sustainable	25	25	50	TW	2	40%

	(CEPG301)	Development Goals							
Semester VI									
47	DSC	EVSC309	Remote Sensing & GIS	30	70	100	T	4	40%
48	DSC	EVSC310	Environmental Biotechnology	15	35	50	T	2	40%
49	DSC	EVSC311	Lab Activities on EVSC309, EVSC310 & Electives	50	50	100	P	4	40%
Select Any One from EVSC312, EVSC313, EVSC314									
50	DSE	EVSC312	Atmospheric Sciences	30	70	100	T	4	40%
	DSE	EVSC313	Environmental Statistics	30	70	100	T	4	40%
	DSE	EVSC314	Environmental Health, Toxicology & Safety	30	70	100	T	4	40%
51	Minor	Minor	To be selected from Minor Courses List other than Major (DSC)	15	35	50	T	2	40%
52	Minor	Minor	To be selected from Minor Courses List other than Major (DSC)	25	25	50	P	2	40%
53	OJT	EVSO315	On-Job Training	50	50	100	TW	4	40%
Exit option: Award of UG Degree in Environmental Science as Major with 132 credits OR Continue with Major and Minor									
Semester VII									
54	DSC	EVSC401	Environmental Science and Environmental Biology	30	70	100	T	4	40%
55	DSC	EVSC402	Natural Resources and Their conservation	30	70	100	T	4	40%
56	DSC	EVSC403	Biodiversity and Conservation	15	35	50	T	2	40%
57	DSC	EVSC404	Lab Activities on EVSC401, EVSC402 & EVSC403	50	50	100	P	4	40%
58	RM	RESR405	Research Methodology	30	70	100	T	4	40%
Select Any One from EVSC406, EVSC407									
59	DSE	EVSC406	Environmental Education, Policies & Legislation	30	70	100	T	4	40%
	DSE	EVSC407	Management of Water Resources	30	70	100	T	4	40%
Semester VIII									
60	DSC	EVSC409	Environmental Chemistry	30	70	100	T	4	40%
61	DSC	EVSC410	Environmental Geosciences & Computer Applications	30	70	100	T	4	40%
62	DSC	EVSC411	Herbal Wealth	15	35	50	T	2	40%

63	DSC	EVSC412	Lab Activities on EVSC409, EVSC410 & EVSC411	50	50	100	P	4	40%
64	OJT	EVSO413	On-Job Training	50	50	100	TW	4	40%
Select Any One from EVS415, EVS416									
65	DSE	EVSC415	Environmental Sustainability	30	70	100	T	4	40%
	DSE	EVSC416	Solid & Hazardous Waste Management	30	70	100	T	4	40%
Four Year UG Honours Degree in Major in Environmental Science and XXX Minor as per selection with 176 credits									

Minor Courses offered by Environmental Science discipline for other discipline of same faculty or different faculty :

a) These minor courses may be selected by learners who have not selected Environmental Science as Major:

SN	Course	Code	Name	CA	EE	TM	Type	CR	Min %
Semester II									
01	Minor	EVSM101	Fundamentals of Environment	15	35	50	T	2	40%
Semester III									
02	Minor	EVSM201	Wildlife Biology	15	35	50	T	2	40%
03	Minor	EVSM202	Lab Activities on EVSM201	25	25	50	P	2	40%
Semester IV									
04	Minor	EVSM203	Water & Noise Quality	15	35	50	T	2	40%
05	Minor	EVSM204	Lab Activities on EVSM203	25	25	50	P	2	40%
Semester V									
06	Minor	EVSM301	Air & Soil Quality	15	35	50	T	2	40%
07	Minor	EVSM302	Lab Activities on EVSM301	25	25	50	P	2	40%
Semester VI									
08	Minor	EVSM303	Environmental Governance	15	35	50	T	2	40%
09	Minor	EVSM304	Lab Activities on EVSM303	25	25	50	P	2	40%

b) Environmental Science learners may select minor courses from the following discipline:

SN	Major in:	Minor in (Anyone of the following other than Major): Refer Appendix I
1	**Environmental Science**	Physics, Chemistry, Mathematics, Botany, Zoology

Open Elective (OE) Courses of Environmental Science offered for other Faculty :

SN	Course	Code	Name	CA	EE	TM	Type	CR	Min %
Semester I									
01	OE	EVSE101	Biodiversity of India	15	35	50	T	2	40%
02	OE	EVSE 102	Futuristic Approach for Smart City	15	35	50	T	2	40%
Semester II									
03	OE	EVSE103	Environmental Economics	15	35	50	T	2	40%
04	OE	EVSE104	Ecotourism	15	35	50	T	2	40%
Semester III									
05	OE	EVSE201	Sustainable Development Goal & Society	15	35	50	T	2	40%
Semester IV									
06	OE	EVSE202	Environmental Law	15	35	50	T	2	40%

Total Credits: 176 and **Total Courses**: 65 {4Y UG degree}

Detailed Syllabi: Available at https://drive.google.com/drive/folders/13lNyj1PT7qN-AAAi2eE8fwDAsCQFWMQz?tid=0B451Yjwt_acQR1VPSUQ4Q0tvams

- Programme Outcomes and Courses Outcomes: Refer **Appendix** – II

Minimum programme duration:
- 4 yrs {4Y UG Honours degree}

Maximum Programme Duration:
- and 8 yrs {4Y UG Honours degree}

Medium of Instruction: English

Type of Program: General

Faculty and Support Staff:

- Director, School of Sciences: Prof. Chetana Kamlaskar
- Academic coordinator: Dr. Jagruti R. Chavan

Instructional Design & Delivery Mechanism:

In order to ensure and maintain the quality in science education, face-to-face counseling for theory and activities type of courses will be conducted at the designated LSCs during Saturdays and Sundays.

- **Minimum number of face-to-face counseling sessions:** 12 (for 4 Credits)

- (For each theory course of 4 credits duration of each counseling session shall be 01 Clock Hour)

- (For each Practical/Project course of 4 credits duration of each counseling session shall be 02 Clock Hour).

- **Minimum number of face-to-face counseling sessions:** 6 (for 2 Credits)

- (For each theory course of 2 credits duration of each counseling session shall be 01 Clock Hour)

- (For each Practical/Termwork course of 2 credits duration of each counseling session shall be 02 Clock Hour).

- **Number of On Job Training (OJT) hours:** 120 hr (for 4 Credits)
  - One month 'On Job Training (OJT)' or Internship (Total Study hours 120 hrs including Internship Report)

- **Required study efforts**:
  1. For 4Y UG Honours degree: Total 5280 Hours including Self-Study during all 08 semesters. 660 Hours (including Self-Study) during each semester.

- **Attendance**: Minimum 80% attendance recommended for all activity type of courses

- **eBook**: eBook in SLM format for each course (Free Download from University website) at all semesters I to semester VIII

Student Support Service System:

At headquarter: Support from School, SSD, Evaluation Division and Exam Unit-3

At Regional Centers: From all 8 regional centers within MH

At Learner Support Centers: Recognized Learner support centers within MH

Web Based:

http://www.ycmou.ac.in

http://ycmou.digitaluniversity.ac

f Procedure for admissions, curriculum transaction and evaluation

1. Define the Admission Policy ***(including web based tools to be adopted*:**
2. Eligibility Criteria:
3. Fee Structure:
4. Financial assistance to Learners (if any):
5. Activity planner of all academic activities of the academic session:
6. Exit Option- UG Certificate UG Diploma, UG Degree:

Policy for Evaluation of

All information related to the programme like admission policy, eligibility and fee structure, course curriculum, medium of instruction, evaluation policy - online home assignments and end examination pattern, SLMs etc. are transacted through prospectus, university website and official notification.

Admissions procedure: A customized "Online Annual Admission system" available at DU portal

http://ycmou.digitaluniveristy.ac

Online payment facility is made available using a credit card or debit card or internet banking.

Admission Eligibility: Entry level Eligibility Criteria

SN	Academic Qualifications Required for Eligibility	
A)	A candidate who has passed Standard 12th / (10+2)th / Level 4.0 examination conducted by Maharashtra State Board of Secondary and Higher Secondary Education/CBSE/ ISC/NIOS or equivalent examinations by any Other State or any other recognised Board with science subjects shall be eligible for admission to First Semester B. Sc. Programmes as per NEP 2020	
	Groups of Science subjects/courses from	Eligible for Any One Major in Science Discipline
1.	1. English 2. Physics, Chemistry, Mathematics, Biology	Any One Major from: Environmental Science
2.	1. English 2. Physics, Chemistry, Mathematics	Any One Major from: Environmental Science
3.	1. English 2. Physics, Chemistry, Biology	Any One Major from: Environmental Science
4.	1. English 2. Vocational Course of 200 Marks 3. Physics, Chemistry, Mathematics	Any One Major from: Environmental Science

learner progress along with methods and tools:		

5.	1. English 2. Vocational Course of 200 Marks 3. Physics, Chemistry, Biology		Any One Major from: Environmental Science
6.	1. English 2. Physics, Chemistry 3. Any one of the following Optional Course of 100 Marks : Geography, Geology, Food Science and Technology, Agriculture Science and Technology, Animal Science and Technology, Defence Studies		Any One Major from: Environmental Science
OR			
B)	A candidate who has passed (10+3) years or (12+2) years Diploma from Maharashtra State Technical Board / a statutory or recognized board/ university in India		
	Description		Eligible for Any One Major in Science Discipline
1.	(10+3) years / (12+2) years Engineering Diploma		Any One Major from: Environmental Science
OR			
C)	A candidate who has passed Higher Secondary School Certificate (10+2) Examination with English and any of the following +2 Level HSC Vocational (MCVC) Group		
	HSC Vocational (MCVC) Group		Eligible for Any One Major in Science Discipline
1.	Agriculture Group or Fisheries Group	Horticulture (KA, KB, KC)	Any One Major from: Environmental Science
		Crop Science (LA, LB, LC)	
		Animal Husbandry and Dairy Technology (MA, MB, MC)	
		Fisheries Technology (NA, NB, NC)	
2.	Catering and Food Products Technology	Catering and Food Products Technology (SA, SB, SC)	Any One Major from: Environmental Science
3.	Paramedical Group	Child, Old Age and Health care services (QA, QB, QC)	Any One Major from: Environmental Science

Total programme Fee: Total ₹ 57,522/- for all 08 Semesters, which is duly approved by the university authorities [Will be updated as per University Policy decision]

Curriculum Transaction:

- 01 SLM e-Book will be developed for each theory course
- Total 12/06 Face-To-Face counseling sessions, each of 60 Minutes duration, will be provided at respective learner support center, for each theory course.
- Total 12/18 Face-To-Face counseling sessions, each of 120 Minutes duration, will be provided at respective learner support center, for each practical/Field project/ OJT/ CC courses. In the laboratory, instruction would be given for the experiments followed by demonstration and finally the learners have to do the experiments individually.
- Curriculum updation will be after every 3 years

Activity planner: This University and School will follow the Programme Calender declared by UGC/DEB, New Delhi from time to time. Teaching-Learning of students shall start from 01-September/01-Feb every year. Online continuous assessment proposed for all offered programmes.

SN	Activity Description	Yearly Pattern/ Odd semesters like 01, 03, 05 and 07 From 01-Sep Till 31-Jan	Even semesters like 02, 04, 06 and 08 From 01-Feb Till 31-Jul
Online Admission: offered on Annual basis for 2 semesters in each academic year. Only for 'C149: Certificate progarmme in Beekeeping', Admissions shall be offered on Winter and Summer batch basis.			
01	Fresh and Further Yearly Admission	From June/ July Till Aug (For C149, Winter Batch: From Jul)	NA (For C149, Summer Batch: From Jan)
Teaching – Learning at the resp Learning Support Centers/ SCs for all Theory, Practical, Term-Work, Studio & Project Courses			
02	Teaching – Learning (16 Weeks) & Backlog Clearing	**From 01-Sep Till 30-Nov**	**From 01-Feb Till 23-May**
Online End Exam (EE) Form Submission (Required only for Repeater Students)			
03	**Online** EE Form Submission by SCs/ students at University	On or Before 21-Oct	On or Before 23-Apr
Continuous Assessment (CA) Submission			
05	CA Availability	From 01-Sep Till 30-Nov	From 01-Mar Till 23-May
06	CA Submission by Students	From 01-Nov Till 30-Nov	From 01-May Till 31-May
End Examination (EE)			
07	**End Exam for Theory Courses**	**From 1-Dec to 10-Dec**	**From 25-May to 05-Jun**
08	EE for Activity Courses (Pr, TW, PW, STW, SV)	Immediately after/ before the schedule of the end exam for theory courses, but positively before 15-Dec	Immediately after/ before the schedule of the end exam for theory courses, but positively before 15-Jun
10	End Exam Result Declaration	On or Before 31-Jan	On or Before 31-Jul
Semester End Vacation			
11	Semester End Vacation	Jan	July

Policy:
Refer Evaluation pattern given in **Appendix** III.
For exit option:

1. **Multiple Entry Multiple Exit Option**:
   Compliance with MS G.R. No. NEP-2022/CR No. 09/VISHI-3/शिकाना, dated 20April, 2023.

SN	Level of the Programme	Entry Option (with criteria)	Exit Option (with criteria)

<table>
<tr><td></td><td></td><td>
<table>
<tr><td>1</td><td>Certificate Level</td><td>A candidate who has passed Standard 12th/ (10+2)th with science subjects/(10+3) years or (12+2) years Diploma/ (10+2) Examination with English and +2 Level HSC Vocational (MCVC) Group</td><td>Award of UG Certificate in Environmental Science with 44 credits and an additional 4 credits core NSQF course/ Internship.</td></tr>
<tr><td>2</td><td>Diploma Level</td><td>UG Certificate in Environmental Science with 40-44 credits</td><td>Award of UG Diploma in Environmental Science and Minor with 88 credits and an additional 4 credits core NSQF course/ Internship course/ Internship</td></tr>
<tr><td>3</td><td>Degree Level</td><td>UG Diploma in Environmental Science and XXX Minor as per selection with 80-88 credits</td><td>Award of UG Degree in Environmental Science with 132 credits</td></tr>
</table>
</td></tr>
<tr><td>g</td><td>Requirement of the Laboratory Support and Library Resources:
1. Laboratory Support to the learners (if any):
2. Provision of Practical book for learners (if any):
Provision of Virtual Reality Methods for Practical in case of Online learning (if any):</td><td>Laboratory requirement and Library Resources – Yes. Being mandatory requirement of the programme, Institutes/Colleges affiliated with conventional university offering the following programme:
A. For Major in Environmental Science:
i. Laboratory facility of B.Sc. in Environmental Science OR
ii. Laboratory facility of B.Sc. in Chemistry and any one out of following Life Sciences programme (Botany/Zoology/Biotechnology/Microbiology)
will be only recognized as a Learner support center of this university for this programme. So, requirement of laboratory support and library resources will be automatically ensured.
Additionally, school provides practical workbook in the form SLM book and other learning resources to all enrolled learners. University has already initiated in-house Science Laboratory development task at HQ, these labs will be made available to the enrolled learners in future.
Recommended: Recognized LSCs with
• Computer infrastructure with Wi-Fi/broadband connection with Environmental Science related software/tool and Library facilities</td></tr>
<tr><td>h</td><td>Cost Estimate of the Program and the Provisions:
Indicate the Budgetary Requirement for:
1. Programme Development
2. Program Delivery
Program Maintenance</td><td>Budget provision for this development under A.27.P.38: Fees/Royalties/ Honorarium to Writer/Editors/Trans.

SLM development cost: approximately ₹ 60,00,000/-</td></tr>
<tr><td>i</td><td>Quality Assurance Mechanism and expected Program Outcomes*:
1. Define the Review Mechanism of the Program for enhancing the standards of curriculum, instructional design relevant to professional requirements:</td><td>B.Sc. (Honours) programme is designed to provide scientific as well as professional level competency to learners, and offers advanced theoretical as well as practical knowledge to learners. This programme enables the learner to develop interest in knowing more about the Environmental Science and to develop research attitude. University has policy to review and revise every course at least once in five years of its launching.
Quality Assurance Mechanism: The following key result areas will be closely monitored.
• Well qualified and experienced experts nomination on Programme Advisory Committee (PAC) for design and development of relevant course content</td></tr>
</table>

	2. Define Program Benchmark Statements: 3. Mechanism for Monitoring the effectiveness of the program: ***(Minimum standards must adhere to "UGC Open and Distance Learning Programmes and Online Programmes Regulations, 2020" & directions of the Statutory Bodies of the University)**	• Well qualified subject experts for SLM development and Evaluation task • Enrolment of student (Equated Access) • Equal weightage for each credit in learner evaluation • Demonstrate in-depth knowledge of Environment Science, both in theory and practical • Examination Results • Placements/satisfaction of passing out students • Administrative/stakeholder feedback • Centre for Internal Quality Assurance (CIQA) to ensure quality of offered science programmes **Expected Program Outcomes:** After successful completion of this programme, students will be able to • Flexible Career Paths: Graduates of this Programme are well-prepared for diverse career opportunities, including academia, research, industry, and entrepreneurship. They can pursue careers in areas such as Environmental Impact Assessment, Renewable Energy, Pollution control technology, Remote Sensing and GIS. • Holistic Skill Development: The Programme focuses on holistic development by enhancing problem-solving skills, critical thinking abilities, and laboratory proficiency in Environmental Science. • Research Orientation: Students are encouraged to develop a research-oriented mind set, allowing them to contribute to scientific advancements in fields that require expertise in Environmental Science. • Ethical Responsibility: The Programme in stills ethical values and academic integrity, emphasizing responsible conduct in scientific research and experimentation. • Global Perspective: Graduates are equipped with knowledge and skills that are relevant not only in the Indian context but also on a global scale, making them competitive in international research and job markets.

B. **Duration & Nomenclature**

Name of Programme: -	Bachelor of Science (Honours) (Environmental Science)
Medium	English
Year	2025-26
Level	UG Level 4.5
Academic Session	July Onwards
Entry Qualification (as per the Specification of Degrees, 2014)	A candidate who has passed Standard 12th / (10+2)th / Level 4.0 examination conducted by Maharashtra State Board of Secondary and Higher Secondary Education/CBSE/ ISC/NIOS or equivalent examinations by any Other State or any other recognised Board with science subjects. OR A candidate who has passed (10+3) years or (12+2) years Diploma from Maharashtra State Technical Board / a statutory or recognized board/ university in India. OR A candidate who has passed Higher Secondary School Certificate (10+2) Examination with English and any of the following +2 Level HSC Vocational (MCVC) Group: Horticulture (KA, KB, KC) Crop Science (LA, LB, LC)

	Animal Husbandry and Dairy Technology (MA, MB, MC) Fisheries Technology (NA, NB, NC) Catering and Food Products Technology (SA, SB, SC) Child, Old Age and Health care services (QA, QB, QC) For details Refer Appendix IV
Duration (as per the Specification of Degrees, 2014)	1) 4-year B.Sc. (Honours) 2) 3-year B.Sc.
Name of the Department	School of Sciences

C. **Mode of Evaluation**

Year	2025	
Whether Weightages to continuous assessment and end semester examinations or term end examinations as per clause mentioned in Regulations	Yes 1. 30% - 70% weightage Pattern for theory 2. 50% - 50% Weightage pattern for Practical/OJT/FP/VSC/SEC*/CC/CEP *Only One SEC course is Theory type	
Examination Scheme	Formative and Summative	
Percentage of Continuous Assessment (%)	Theory	30%
	Practical/OJT/FP/VSC/SEC/CC/CEP	50%
Percentage of Term End Examination (%)	Theory	70%
	Practical/OJT/FP/VSC/SEC/CC/CEP	50%
Pass or Fail Criteria	40% for Pass	
Pass/Fail Criteria (% Pass Marks)	40% and above - Pass Below 40 % - Fail	

D. Mode of Examination

Whether examination through Online(For ODL Programs)	No

E. SLM Development (Submit all SLM in pdf in pendrive and prepare the SLM availability sheet in the order as per sample in pdf for each program separately)

Particulars	% SLM in house developed	% SLM in collaboration with with HEI(It should not be more than 40% of total SLM .If it is in collaboration then provide MOU in Soft & Hard copy
Printing Material	100%	–
Audio-Video Material	-	–
Online Material	Yes [pdf of SLMs]	–
Compute based Material	–	–

F. Program wise faculty details (Requirement of Minimum three faculty not below the rank of Assistant Professor to be furnished in the following format – to be taken from Establishment

Sr. No.	Emp. No	Name of the Faculty	Designation	Date of Joining	Qualification	Specialization	Teaching experience	Address	Phone no	Email	Appointment letter
1	1067	Dr. Jagruti R. Chavan	Academic Coordinator	11/03/2024	M.Sc., SET, Ph.D. Environmental Science, PGD Urban Planning and Development	Environmental Science	09 Years	YCMOU	8554894494	jrchavan22@gmail.com	04/03/2024

G. List of Learner Support Centres Program wise and Region wise to be submitted as per following format. (We have intimated the same to Director SSD. **You are requested to give him the list of programs for which the LSCs data is required.**) – to be taken from SSD Director

Sr. No	Study centre code	Name & Address of LSC	Name of the HEI to which college/Institute is affiliated (where LSC is established)	Whether the College /Institute Private or Govt. (where LSC is established)	Name and Contact Details of Coordinator/ counsellor :	Qualification of Coordinator/ Counsellor :	No. of Counsellor :	Name of Proposed Programmes/ Course from July, 2023 onwards:	Approved	Not Approved with Reason

Minor Courses offered from School of Sciences for other discipline of same faculty or different faculty other than Environmental Science as a Major

LEVEL	SEM	Credits	Course Type	Botany	Zoology	Chemistry	Physics
4.5	II	**2**	**T**	**BOTM101**: Plant Diversity	**ZOOM101:** Animal Diversity of Invertebrates	**CHEM101:** Introduction to Physical Chemistry-I	**PHYM101:** Basics of Electricity & Magnetism
5.0	III	**2**	**T**	**BOTM201**: Morphology and Anatomy of Flowering Plants	**ZOOM201:** Principle of Ecology	**CHEM201:** Introduction to Organic Chemistry	**PHYM201:** Thermal Physics
		2	**P**	**BOTM202:** Lab Activities on BOTM201	**ZOOM202:** Lab Activities on ZOOM201	**CHEM202:** Lab Activities on CHEM201	**PHYM202:** Lab Activities on PHYM201
	IV	**2**	**T**	**BOTM203:** Plant Physiology	**ZOOM203:** Fundamentals of Cell Biology	**CHEM203:** Introduction to Inorganic Chemistry	**PHYM203:** Oscillations & Optics
		2	**P**	**BOTM204**: Lab Activities on BOTM203	**ZOOM204:** Lab Activities on ZOOM203	**CHEM204:** Lab Activities on CHEM203	**PHYM204:** Lab Activities on PHYM203
5.5	V	**2**	**T**	**BOTM301:** Introduction to Cytology	**ZOOM301:** Introduction to Aquatic Biology	**CHEM301:** Introduction to Physical Chemistry-II	**PHYM301:** Computational Physics
		2	**P**	**BOTM302:** Lab Activities on BOTM301	**ZOOM302:** Lab Activities on ZOOM301	**CHEM302:** Lab Activities on CHEM301	**PHYM302:** Lab Activities on PHYM301
	VI	**2**	**T**	**BOTM303:** Plant Genetics and Variation	**ZOOM303:** General Parasitology	**CHEM303:** Introduction to Organic and Inorganic Chemistry	**PHYM303:** Basics of Instrumentation
		2	**P**	**BOTM304:** Lab Activities on BOTM303	**ZOOM304:** Lab Activities on ZOOM303	**CHEM304:** Lab Activities on CHEM303	**PHYM304**: Lab Activities on PHYM303

Appendix– II

Programme Objectives, Scope of the Programme & Programme Outcomes (PO)
And
Course Outcomes (CO)

	Programme Name: B.Sc. Honours (Environmental Science)	
1	**Programme Objectives**	This programme has the following broad objectives: • Interdisciplinary Competence: To provide students with a strong foundation in the courses Environmental Science, fostering interdisciplinary knowledge and skills. • Deep Understanding: To ensure that students gain a deep understanding of the fundamental principles and concepts in Environmental Science. • Problem-Solving Abilities: To equip students with problem-solving skills, enabling them to apply scientific methodologies to address complex issues that require expertise in both disciplines. • Laboratory Proficiency: To develop practical laboratory skills, enabling students to design experiments, collect data, and analyze results in both Environmental Science. • Research Aptitude: To nurture research aptitude by encouraging students to engage in interdisciplinary research projects at the undergraduate level. • Effective Communication: To enhance communication skills, allowing students to communicate scientific findings effectively, both in writing and orally. • Ethical Responsibility: To instill ethical values and academic integrity, promoting responsible conduct in scientific research and experimentation. • Flexibility and Adaptability: To prepare students for diverse career opportunities, including academia, research, industry, and entrepreneurship, by offering a versatile skill set. • Leadership and Collaboration: To develop leadership qualities and the ability to work collaboratively in multidisciplinary teams to address complex challenges. • Awareness of Contemporary Issues: To create awareness of contemporary scientific issues, including environmental sustainability, emerging technologies, and societal relevance.
2	**Scope of the Programme**	After successful completion of this programme, learners may get opportunities in various fields/sectors to work as • Multidisciplinary Foundation: The Programme offers students a strong foundation in Environmental Science, allowing them to explore the intersection of these disciplines. • Interdisciplinary Research: Students are encouraged to engage in interdisciplinary research projects, where they can apply their knowledge of Environmental Science to address complex scientific challenges. • Specialization Opportunities: While Environmental Science is the major field of study provides students with the opportunity to specialize in certain areas, such as Environmental Pollution, Environmental Audit, Soil Health Management, etc • Flexible Career Paths: Graduates of this Programme are well-prepared for diverse career opportunities, including academia, research, industry, and entrepreneurship. They can pursue careers in areas such as Environmental Impact Assessment, Renewable Energy, Pollution control technology, Remote Sensing and GIS. • Holistic Skill Development: The Programme focuses on holistic development by enhancing problem-solving skills, critical thinking abilities, and laboratory proficiency in Environmental Science

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Research Orientation: Students are encouraged to develop a research-oriented mindset, allowing them to contribute to scientific advancements in fields that require expertise in Environmental Science.
Ethical Responsibility: The Programme instills ethical values and academic integrity, emphasizing responsible conduct in scientific research and experimentation.
Global Perspective: Graduates are equipped with knowledge and skills that are relevant not only in the Indian context but also on a global scale, making them competitive in international research and job markets.
Preparation for Further Studies: The Programme prepares students for postgraduate studies in either Environmental Science, allowing them to specialize further in their chosen field.
Lifelong Learning: The scope extends beyond graduation, promoting a commitment to lifelong learning and staying updated with advancements in both Environmental Science throughout their careers.

</td></tr>
<tr><td>3</td><td>Programme Outcome</td><td>
After successful completion of this programme, learners will be able to

Demonstrate interdisciplinary competence by applying principles from Environmental Science to solve real-world problems.
Exhibit a profound understanding of core concepts and theories in Environmental Science.
Excel in critical thinking and problem-solving, addressing complex issues that span all disciplines.
Possess proficiency in laboratory techniques, enabling the design and execution of experiments in Environmental Science.
Engage in interdisciplinary research projects and contribute to scientific advancements.
Communicate scientific findings effectively, both in written reports and oral presentations.
Adhere to ethical standards and academic integrity in research and experimentation.
Adapt to diverse career opportunities, showing flexibility in their choice of career paths.
Collaborate effectively in multidisciplinary teams, displaying leadership and teamwork skills.
Stay informed about contemporary scientific issues, including their societal implications.

</td></tr>
<tr><td>4</td><td>Course Outcomes</td><td>
<table>
<tr><th>SN</th><th>Course Code & Name</th><th>Course Outcomes</th></tr>
<tr><td colspan="3">Semester I</td></tr>
<tr><td>1.</td><td>EVSC101: Ecology & Ecosystem</td><td>• The course will enable the students to gather-in-depth knowledge on the basic concepts of ecology.
• The students will learn the abiotic and biotic factors that influence ecosystem structure.
• It will help understand the concept of the basic laws in ecology
• The students will understand the important biogeochemical cycles.
• The students will learn about various community concepts.</td></tr>
<tr><td>2.</td><td>EVSC102: Lab Activities on EVS101</td><td>• Demonstrate a solid understanding of the diversity of animal and plant life.
• Develop the ability to identify surrounding flora and</td></tr>
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					fauna. • Demonstrate the analysis method for chlorophyll and productivity determination in and ecosystem. • Recognize ethical considerations related to animal behavior, plant conservation, and human effect on ecosystem by field visit.
			3.	**EVSE101** Biodiversity of India (For other Faculty)	• To get a deep knowledge on biodiversity richness in global scale and biogeography of India. • To assess the value of biodiversity wealth of our Nation. • To analyze various threats to our biodiversity and able to suggest measures for conservation Strategies. • To trained effectively and scientifically to convey the message of sustainable use of resources and conservation of biodiversity to the public and young generation. •
			4.	**EVSE102** Futuristic Approach for Smart City (For other Faculty)	• Demonstrate detailed knowledge of each components of Smart City. • Analyze about the basics of Soft and Hard Infrastructure of Smart City. • Demonstrate the basic management of Smart City projects. • Design and Plan the Smart City services. • Basic design ability of Internet of Thing and Cloud Data Center
			5.	**EVSV101:** Environmental Microbiology	• Able to apply concepts of microbial diversity and ecology to real-world environmental scenarios. • To identify and propose solutions for environmental issues related to microbial contamination and degradation. • Understand and implement bioremediation strategies using microorganisms to address pollution.
			6.	**SECS101:** Basic Instrumentation Skill	• Demonstrate competence in using various instruments and equipment. • Safely conduct experiments and collect reliable data. • Analyze and interpret experimental results effectively. • Apply instrumentation skills in their respective fields of study and research. • Foster a culture of safety, ethics, and environmental responsibility in scientific work. • Identify, describe, and explain the function of various scientific instruments used in their respective field. • Demonstrate correct operation, calibration, and maintenance procedures for laboratory instruments, ensuring accuracy and reliability in their measurements. • Adhere to laboratory safety guidelines, use personal protective equipment (PPE) appropriately, and follow best practices to minimize risks and ensure a safe working environment.

		8.	**VECD101:** Environmental Education	• Develop a solid understanding of key environmental concepts, issues, and challenges. • Recognize the interdisciplinary nature of environmental studies by integrating knowledge from various fields, such as biology, chemistry, sociology, and economics. • Develop the ability to advocate for environmental causes and promote sustainable practices within their communities and beyond. • Foster a sense of environmental citizenship, encouraging students to actively contribute to a more sustainable and environmentally conscious society. • Develop a solid understanding of key environmental concepts, issues, and challenges. • Recognize the interdisciplinary nature of environmental studies by integrating knowledge from various fields, such as biology, chemistry, sociology, and economics. • Develop the ability to advocate for environmental causes and promote sustainable practices within their communities and beyond. • Foster a sense of environmental citizenship, encouraging students to actively contribute to a more sustainable and environmentally conscious society.
		9.	**IKSK101:** Generic IKS	• To be updated
		10.	**CCRX101:**	• As per List
		Semester II		
		1.	**EVSC103:** Environmental Chemistry & Physics	• Students will be able to evaluate the role of light and matter in the environment. • The Ability to demonstrate understanding of the inherent forces and flows responsible for various naturally occurring events. • The students will learn fundamental knowledge about — environmental chemistry, water and soil chemistry. • The students will be able to explain why chemistry is an integral Activities for addressing social, economic, and environmental problems.
		2.	**EVSC104:** Lab Activities on EVS103	• To develop proper understanding of different techniques for analyzing soil, air and water parameters • To get acquainted about laboratory safety precautions, rules and instrument handling skills. • To develop understanding about weather stations and instruments used for weather forecasting.
		3.	**EVSM101:** Fundamentals of Environment (For other Discipline)	• Demonstrate an understanding of the relationship between the physical environment (air, water, and land) and human societies. • Engage in discussions and debates about environmental challenges, demonstrating the ability to critically assess different perspectives.

					• Define and explain fundamental environmental concepts, including ecosystems, biodiversity, pollution, sustainability, and natural resources.
			4.	**EVSE103:** Environmental Economics (For other Faculty)	• To analyze and interpret data related to environmental issues, applying economic theories and principles to real-world scenarios. • To explain and assess market-based solutions to environmental problems, such as carbon pricing and tradable permits. • Demonstrate an understanding of contemporary environmental issues, trends, and debates, and their economic implications.
			5.	**EVSE104:** Ecotourism (For other Faculty)	• To be equipped to assess the environmental impacts of tourism activities, using tools and methodologies to evaluate sustainability practices. • Develop skills in planning and managing ecotourism initiatives, including creating business plans that balance economic viability with environmental sustainability. • Understand how to create effective marketing strategies that promote ecotourism experiences while emphasizing sustainability and conservation. • Analyze the economic benefits and challenges of ecotourism for local communities, evaluating how it can contribute to sustainable development
			6.	**EVSV102:** Basics of Environmental Audit	• Understand the types and methodologies of environmental audits • Demonstrate how to assess organizational compliance with environmental obligations. • Analyze findings to assess compliance and identify performance gaps. • Prepare a clear and concise environmental audit report, highlighting findings, non-conformities, and recommendations.
			7.	**SECS101:** MS–Excel with AI	• Effectively use basic Excel functions and features to perform data analysis and manipulation tasks. • Create various types of charts and visualizations in Excel and interpret them to extract meaningful insights • Use Excel's statistical tools to perform and interpret basic statistical analyses. • Leverage AI-powered features in Excel to gain insights and enhance their data analysis capabilities. • Use Power Query to import, clean, and transform data from various sources efficiently. • Create and use macros to automate repetitive tasks, improving efficiency in Excel..
			8.	**AECL101:** English Communication	• Communicate effectively in spoken English, including pronunciation, fluency, and clarity. • Develop strong listening skills to understand spoken English, including different accents and dialects. • Create and deliver effective presentations, including the use of visual aids and public speaking techniques. • Write professional documents (e.g., resumes, cover letters), participate in job interviews, and communicate effectively in workplace settings.

				• Communicate effectively in spoken English, including pronunciation, fluency, and clarity. • Develop strong listening skills to understand spoken English, including different accents and dialects. • Create and deliver effective presentations, including the use of visual aids and public speaking techniques. • Write professional documents (e.g., resumes, cover letters), participate in job interviews, and communicate effectively in workplace settings.
		10.	**CCRX102:** Yoga	• Proficiency in performing a wide range of yoga asanas (postures), with a focus on alignment, flexibility, and strength. • Proficiency in various breathing techniques, such as Ujjayi, Kapalabhati, and Anulom-Vilom, to enhance respiratory health and overall well-being. • The ability to practice meditation and mindfulness techniques to reduce stress, increase mental clarity, and improve concentration. • A basic understanding of human anatomy and physiology, with a specific focus on the physiological benefits of yoga postures and breathing techniques. • Knowledge of the principles of a yogic lifestyle, including diet, ethical guidelines (Yamas and Niyamas), and stress management.
		Semester III		
		1.	**EVSC201:** Biodiversity Conservation	• To get a deep knowledge on biodiversity richness in global scale and biogeography of India. • To assess the value of biodiversity wealth of our Nation. • To analyze various threats to our biodiversity and able to suggest measures for conservation Strategies. • To trained effectively and scientifically to convey the message of sustainable use of resources and conservation of biodiversity to the public and young generation.
		2.	**EVSC202:** Environment: Indian Culture & Traditions	• Demonstrate a comprehensive understanding of the interdisciplinary nature of ancient environmental studies, integrating concepts from ecology, history, philosophy, and cultural studies. • Identify and articulate sustainable agricultural and resource management practices from ancient India, drawing parallels to modern sustainability challenges. • Demonstrate skills in community engagement and collaboration, applying lessons from ancient communal resource management to modern contexts.
		3.	**EVSC203:** Lab Activities on EVS201	• Integrate knowledge of population assessment in an ecosystem for all species of flora and fauna. • Develop the knowledge of species identification, population census and maintain the record. • To gain knowledge of vegetation mapping with the help of satellite images.
		4.	**EVSM201:** Wildlife Biology	• Define and explain fundamental wildlife biology concepts, such as species, populations, ecosystems,

				(For other Discipline)	and biodiversity. • Analyze the factors influencing wildlife populations, including biotic and abiotic factors, and assess the effects of human activities on population health. • Apply knowledge of behavioral ecology to understand the relationship between wildlife behavior and environmental pressures.
			5	**EVSM202:** Lab Activities on EVSM201 (For other Discipline)	• Demonstrate a solid understanding of the diversity of animal and plant life. • Develop the ability to identify surrounding flora and fauna. • Develop the knowledge of species identification, population census and maintain the record. • To gain knowledge of vegetation mapping with the help of satellite images.
			6.	**EVSE201:** Sustainable Development goals and Society (For other Faculty)	• Demonstrate a thorough understanding of urban ecosystems, including their components, functions, and interactions. • Identify and apply the concepts of ecosystem services in urban planning and policy-making to enhance urban sustainability. • Utilize quantitative and qualitative data to assess urban ecosystem health and inform sustainable development decisions. • Critically evaluate emerging trends and technologies in urban sustainability and propose innovative solutions that address current and future challenges.
			7.	**EVSV201:** Soil Health Management	• Demonstrate the ability to collect representative soil samples using standard methods • Conduct accurate soil tests to analyze physical, chemical, and biological properties • Evaluate soil quality indicators such as organic matter content, pH, and cation exchange capacity • Correlate soil fertility parameters with crop performance and yield potential.
			8.	**AECL201:** Modern Indian Language- I	• To be Updated
			9.	**EVSF204:** Field Project	• Students will demonstrate the ability to apply theoretical knowledge and concepts to real world situations, effectively bridging the gap between academia and practical applications. • Students will develop advanced research and investigative skills, including the ability to design and execute research projects, collect and analyze data, and draw well-founded conclusions. • Students will conduct independent research, demonstrating the ability to formulate research questions, design appropriate methodologies, and independently execute fieldwork or data collection. • Students will exhibit effective collaboration and communication skills, demonstrating the ability to work collaboratively with others, engage in

					professional dialogue, and effectively communicate their research findings to diverse audiences. • Students will showcase advanced problem-solving and critical thinking abilities, demonstrating the capacity to identify and address challenges encountered during fieldwork, analyze complex data, and propose innovative solutions. • Students will demonstrate a thorough understanding of ethical considerations, field safety protocols, and best practices in their chosen field of study.
			10.	**CCRX201:**	• To be Updated
				Semester IV	
			1.	**EVSC205:** Pollution Control Technologies	• To understand strategies, legal requirements and appropriate mitigation and treatment technologies for industrial pollution control. • To comprehend the process design of selected treatment technologies. • To solve open-ended, multi-disciplinary problems typically found in industrial settings. • To explain the principles of physical, chemical, and biological treatment processes.
			2.	**EVSC206:** Natural Resource Management	• Students will identify the major factors depleting water supplies and will be able to develop management strategies to conserve water. • Students will classify the major pollutants of water, air, and land resources and will be able to develop and apply strategies to prevent pollution. • Students will distinguish how invasive plants can affect land and water resources and know the processes involved in controlling invasive species. • Students will be able to compare and contrast alternative energy sources with particular emphasis on biofuels and wind energy.
			3.	**EVSC207:** Lab Activities on EVS205	• To demonstrate proficiency in operating pollution control equipment and technologies, including air quality monitoring devices, water treatment systems, and soil remediation tools. • To critically assess the effectiveness and limitations of different pollution control technologies, considering factors such as cost, efficiency, and environmental impact. • To collect, analyze, and interpret environmental data related to pollution levels and control efficiency, using appropriate statistical and analytical methods.
			4.	**EVSM203:** Water & Noise Quality (For other Discipline)	• Assess and analyze water quality in natural and man-made water bodies, identifying the factors influencing water quality and the role of water quality monitoring. • Define noise pollution, understand its sources (e.g., traffic, industry, urban development), and its environmental and health impacts. • Evaluate noise exposure levels in urban and industrial settings and analyze the relationship between noise pollution and its effects on local

				communities and ecosystems. • Propose noise mitigation strategies to reduce adverse impacts on public health and quality of life in various settings, such as residential, commercial, and industrial areas.
		5.	**EVSM204:** Lab Activities on EVSM203 (For other Discipline)	• Demonstrate the ability to use various laboratory instruments and techniques for pollution analysis • Analyze and interpret pollution data effectively, including understanding statistical results, trends, and environmental significance. • Compare analytical results with environmental standards and regulations to assess pollution levels.
		6.	**EVSE202:** Environmental Law (For other Faculty)	• To demonstrate a thorough understanding of key national and international environmental laws and regulations, including their objectives and implications. • To be able to assess compliance with environmental regulations in various contexts, identifying potential areas of non-compliance and recommending corrective actions. • To develop and propose effective Environmental Management Systems (EMS), demonstrating an understanding of continuous improvement principles.
		7..	**SECS201:** Intellectual Property Rights	• Understand the Concept of IPR and different Kinds of IPR. • Know the procedure for application of various IPs. • Understand infringement and remedies available. • Know various issues relating to protection of IPR in Digital Age
		8.	**AECL202:** Modern Indian Language- II	• To be Updated
		9.	**EVSG208 (CEPG201):**	• To be Updated
		10.	**CCRX202:**	• To be Updated
			Semester V	
		1.	**EVSC301:** Environmental Legislation & Audit	• To demonstrate a thorough understanding of key national and international environmental laws and regulations, including their objectives and implications. • To be able to assess compliance with environmental regulations in various contexts, identifying potential areas of non-compliance and recommending corrective actions. • To develop and propose effective Environmental Management Systems (EMS), demonstrating an understanding of continuous improvement principles.
		2.	**EVSC302:** Environment Impact Assessment	• To demonstrate a thorough understanding of the principles, processes, and significance of Environmental Impact Assessment in environmental management and planning. • To navigate the stages of the EIA process, including screening, scoping, baseline data collection, impact

				analysis, mitigation measures, and public consultation. • To evaluate case studies of completed EIAs, assessing their effectiveness, limitations, and lessons learned for future assessments.
		3.	**EVSC303:** Lab Activities on EVS301, EVS302 & Elective	• Develop a practical understanding of relevant environmental laws and regulations, including how to locate and interpret legal texts and guidelines. • Demonstrate an understanding of the entire EIA process, including screening, scoping, baseline studies, impact assessment, and reporting. • Demonstrate a comprehensive understanding of key atmospheric processes, including weather patterns, climate systems, and atmospheric dynamics. • Apply principles of sustainable development in urban planning, including land use, green infrastructure, and resource management strategies.
		4.	**EVSC304:** Environmental Geosciences	• To acquire practical skills in field methods, including geological mapping, soil sampling, and environmental monitoring, to assess and interpret natural resources and hazards. • To evaluate the environmental impacts of human activities, such as land use change, mining, and pollution, using principles of environmental geology and sustainability. • To understand and apply principles of sustainability in managing natural resources, assessing risks, and promoting environmental stewardship.
		5.	**EVSC305:** Alternate Energy Resources	• Describe the various types of alternative energy sources, including solar, wind, hydro, geothermal, and biomass. • Evaluate the environmental benefits and drawbacks of different alternative energy resources compared to fossil fuels. • Discuss the importance of sustainability in energy production and consumption, and how alternative resources contribute to sustainable development. • Critically evaluate emerging trends and technologies in urban sustainability and propose innovative solutions that address current and future challenges.
		6.	**EVSC306:** Urban Ecosystem & Sustainable Development	• Demonstrate a thorough understanding of urban ecosystems, including their components, functions, and interactions. • Identify and apply the concepts of ecosystem services in urban planning and policy-making to enhance urban sustainability. • Utilize quantitative and qualitative data to assess urban ecosystem health and inform sustainable development decisions. • Critically evaluate emerging trends and technologies in urban sustainability and propose innovative solutions that address current and future challenges.
		7.	**EVSM301:** Air & Soil Quality	• Demonstrate the ability to assess air and soil quality through both field and laboratory techniques, using appropriate tools and instruments.

				(For other Discipline)	• Understand the significance of pollutant concentrations in relation to health impacts and ecosystem health. • Understand and assess various pollution control technologies, such as air filtration systems, scrubbers, and catalytic converters for air, and phytoremediation, composting, and soil stabilization for soil. • Develop the ability to clearly communicate air and soil quality findings to diverse audiences, including policymakers, environmental professionals, and the public.
			8.	**EVSM302** Lab Activities on EVSM301 (For other Discipline)	• Demonstrate the ability to use various laboratory instruments and techniques for pollution analysis • Analyze and interpret pollution data effectively, including understanding statistical results, trends, and environmental significance. • Compare analytical results with environmental standards and regulations to assess pollution levels.
				EVSV301: Basics of EMS	• Demonstrate a comprehensive understanding of the structure and purpose of an Environmental Management System • Conduct environmental aspect and impact assessments to identify significant risks and opportunities. • Develop essential EMS documentation, including procedures, records, and operational controls. • Prepare for and conduct internal EMS audits, identifying non-conformities and opportunities for improvement.
			9.	**EVSF307:** Field Project	• Students will demonstrate the ability to apply theoretical knowledge and concepts to real world situations, effectively bridging the gap between academia and practical applications. • Students will develop advanced research and investigative skills, including the ability to design and execute research projects, collect and analyze data, and draw well-founded conclusions. • Students will conduct independent research, demonstrating the ability to formulate research questions, design appropriate methodologies, and independently execute fieldwork or data collection. • Students will exhibit effective collaboration and communication skills, demonstrating the ability to work collaboratively with others, engage in professional dialogue, and effectively communicate their research findings to diverse audiences. • Students will showcase advanced problem-solving and critical thinking abilities, demonstrating the capacity to identify and address challenges encountered during fieldwork, analyze complex data, and propose innovative solutions. • Students will demonstrate a thorough understanding

				of ethical considerations, field safety protocols, and best practices in their chosen field of study.
		10.	**EVSG308 (CEPG301):** Awareness of Sustainable Development Goal	• To be Updated
			Semester VI	
		1.	**EVSC309:** Remote Sensing & GIS	• Analyze remote sensing data to derive meaningful insights related to environmental changes, land use, urban development, and natural resource management. • Design and implement a comprehensive remote sensing or GIS project, from data collection and analysis to presentation of results, addressing a real-world issue. • Engage in critical thinking and problem-solving, formulating innovative solutions to geographic challenges using remote sensing and GIS tools.
		2.	**EVSC310:** Environmental Biotechnology	• Demonstrate a thorough understanding of the core principles of environmental biotechnology, including microbial ecology, bioremediation, and the role of biotechnology in sustainable development. • Design and conduct experiments that utilize environmental biotechnology methods to address specific environmental challenges, including pollution and resource recovery. • Apply biotechnological techniques for environmental applications, such as microbial remediation, bio augmentation, and waste treatment processes.
		3.	**EVSC311:** Lab Activities on EVSC309, EVSC310 & Elective	• Integrate concepts and techniques from remote sensing, biotechnology, statistics, and toxicology to design and conduct interdisciplinary experiments that address real-world environmental issues. • Effectively apply biotechnological methods in laboratory settings, such as microbial assays and biosensor technologies, to investigate environmental contamination and remediation. • Demonstrate critical thinking skills by evaluating experimental methodologies, identifying potential limitations, and proposing improvements in study design or data collection.
		4.	**EVSC312:** Atmospheric Sciences	• Demonstrate a thorough understanding of atmospheric processes, including weather systems, climate dynamics, and the interaction between the atmosphere and Earth's surface. • Analyze and interpret meteorological data from various sources, including satellites, weather stations, and climate models, to assess current conditions and trends. • Develop the ability to use atmospheric models for simulating weather and climate scenarios, critically evaluating model outputs and their implications.

					• Analyze and evaluate policies related to atmospheric sciences, such as climate policy, air quality regulations, and disaster preparedness strategies.
			5.	**EVSC313:** Environmental Statistics	• Design and implement effective data collection strategies, ensuring the reliability and validity of environmental data, including sampling techniques. • Proficiently use statistical software (e.g., R, Python, SPSS) to analyze environmental data, applying various statistical methods for data exploration and hypothesis testing. • Develop and utilize statistical models to describe and predict environmental processes, demonstrating the ability to address complex environmental questions. • Understand and articulate the ethical implications of data collection and statistical analysis in environmental research, including considerations of data integrity and responsible communication of findings.
			6.	**EVSC314:** Environmental Health, Toxicology & Safety	• Demonstrate a thorough understanding of the fundamental concepts of environmental health, toxicology, and safety, including key terminology and principles. • Analyze and interpret environmental health data, utilizing statistical methods and toxicological models to draw evidence-based conclusions. • Design and implement safety protocols for handling hazardous materials in both laboratory and field settings, ensuring compliance with regulatory standards.
			7.	**EVSM303:** Environmental Governance	• To be able to assess compliance with environmental regulations in various contexts, identifying potential areas of non-compliance and recommending corrective actions. • To develop and propose effective Environmental Management Systems (EMS), demonstrating an understanding of continuous improvement principles. • To navigate the stages of the EIA process, including screening, scoping, baseline data collection, impact analysis, mitigation measures, and public consultation. • To evaluate case studies of completed EIAs, assessing their effectiveness, limitations, and lessons learned for future assessments.
			8.	**EVSM304:** Basics of EMS	• To be able to assess compliance with environmental regulations in various contexts, identifying potential areas of non-compliance and recommending corrective actions. • To develop and propose effective Environmental Management Systems (EMS), demonstrating an understanding of continuous improvement principles. • To navigate the stages of the EIA process, including screening, scoping, baseline data collection, impact analysis, mitigation measures, and public consultation.

				• To evaluate case studies of completed EIAs, assessing their effectiveness, limitations, and lessons learned for future assessments.
		9.	**EVSO315:** On-Job Training	• Demonstrate proficiency in applying theoretical knowledge and academic concepts to real-world professional situations. • Possess job-specific skills that are relevant to their chosen field of study, enabling them to perform tasks and responsibilities effectively and efficiently. • Acquire a comprehensive understanding of industry practices, trends, and challenges, contributing to their overall knowledge and expertise in the field. • Establish professional networks and relationships, expanding their professional connections and opportunities for future collaborations and career advancement. • Develop problem-solving and critical thinking abilities, demonstrating the ability to analyze complex situations, make informed decisions, and propose effective solutions. • Demonstrate professionalism, adaptability, and effective communication skills in a professional work environment. •
		Semester VII		
		1.	**EVSC401:** Environmental Science and Environmental Biology	• Applying scientific principles and methods to investigate and analyze environmental issues. • Evaluating the impact of human activities on ecosystems, biodiversity, and natural resources. • Generating creative solutions to address environmental challenges and promote sustainability. • Engaging in ethical decision-making processes related to environmental and biological issues. • Conducting fieldwork and laboratory experiments to collect and analyze environmental data.
		2.	**EVSC402:** Natural Resources and Their Conservation	• Students will be able to propose and evaluate conservation strategies and practices to mitigate the impacts on natural resources. • Students will understand the economic, social, and environmental values associated with the conservation of natural resources. • Students will be able to analyze case studies and assess the interdependencies between natural resources, ecosystems, and human well-being. • Students will be able to apply critical thinking skills to evaluate and propose solutions for challenges related to natural resource conservation.
		3.	**EVSC403:** Biodiversity and Conservation	• Demonstrate an advanced understanding of biodiversity science, including the factors influencing biodiversity patterns and processes, the role of species interactions, and the impact of human activities on biodiversity. • Proficient in conducting independent research in biodiversity and conservation, including designing

					and implementing field studies, analyzing data using advanced statistical methods, and communicating research findings effectively. • Critically evaluate the genetic aspects of biodiversity conservation, including assessing genetic diversity, understanding population dynamics, and utilizing genetic information in conservation planning. • Critically analyze and evaluate conservation strategies and policies, considering their ecological, socio-economic, and ethical implications, and propose evidence-based recommendations for effective conservation. • Integrate knowledge and perspectives from various disciplines to develop interdisciplinary approaches to biodiversity conservation. They will collaborate effectively with professionals from diverse backgrounds to address complex conservation issues.
			4.	**EVSC404:** Lab Activities on EVS C401, EVSC402 & EVSC403	• Evaluating the impact of human activities on ecosystems, biodiversity, and natural resources. • Generating creative solutions to address environmental challenges and promote sustainability. • Analyze case studies and assess the interdependencies between natural resources, ecosystems, and human well-being.
			5.	**EVSC406:** Environmental Education, Policies & Legislation	• Demonstrate a comprehensive understanding of the principles, theories, and approaches used in environmental education. • Apply environmental education strategies and methodologies to design and implement effective educational programs and initiatives. • Evaluate the impact of environmental education programs on knowledge, attitudes, and behaviors related to environmental conservation and sustainability. • Analyze and interpret environmental policies, legislation, and legal frameworks at the national and international levels. • Assess the effectiveness and impact of environmental policy
			6.	**EVSC407:** Management of Water Resources	• • Identifying and address complex water management challenges, applying their analytical skills to make informed decisions. • Equipped to design and implement sustainable water management practices that consider environmental, social, and economic factors. • Capable of conducting advanced research on water resource-related topics, utilizing appropriate methodologies and data analysis techniques. • Contributing to the development and evaluation of water policies and governance frameworks at various levels, including regional and national scales.
			7.	**RESR405:** Research Methodology	• Select and apply appropriate research designs based on the research question or problem. • Formulate clear and relevant research questions or hypotheses. • Analyze and interpret data using appropriate

				statistical techniques. • Identify and address ethical considerations in research, ensuring the protection of participants and data integrity. • Develop critical thinking skills in evaluating research studies, identifying strengths and weaknesses, and proposing improvements.
		Semester VIII		
		1.	**EVSC409:** Environmental Chemistry	• Demonstrate a deep understanding of the principles and theories of environmental chemistry and their application to real-world environmental issues. • Analyze and assess the behavior of environmental pollutants in different environmental compartments, applying concepts of transport, transformation, and fate. • Possess advanced skills in environmental monitoring and assessment techniques, including sampling, analysis, and data interpretation. • Evaluate and propose remediation strategies for environmental pollutants, considering their effectiveness, feasibility, and environmental implications.
		2.	**EVSC410:** Environmental Geosciences & Computer Applications	• Demonstrate an advanced understanding of the principles and concepts of environmental geosciences and their applications to environmental management. • Proficient in using computer applications, such as GIS, remote sensing, and modeling software, for analyzing and visualizing environmental data and processes. • Integrate geospatial and environmental data, conducting spatial analysis and modeling to assess environmental patterns and relationships. • Apply computer applications to solve complex environmental problems and make informed decisions in various environmental domains. • Demonstrate awareness and understanding of emerging technologies and trends in environmental geosciences and computer applications, and their potential applications to environmental research and management.
		3.	**EVSC411:** Herbal Wealth	• Equipped with advanced knowledge and expertise in herbal medicine, enabling them to make informed decisions and recommendations in various healthcare settings. • Critically evaluate the scientific literature and apply evidence-based approaches to assess the efficacy and safety of herbal interventions. • Designing and conduct research studies related to herbal medicine, contributing to the advancement of knowledge in this field. • Integrating herbal medicine knowledge into broader healthcare contexts, collaborating with other healthcare professionals to enhance patient care. • Grasping of the quality assurance measures and regulatory frameworks related to herbal products and traditional medicine practices.

					• Advocate for the recognition and incorporation of herbal medicine in healthcare systems and public health initiatives. C • Contributing to advancements in herbal medicine research, potentially leading to the development of new herbal products or therapeutic approaches.
			4.	**EVSC412:** Lab Activities on EVS 409, EVS 410 & EVS 411	• Demonstrate a deep understanding of the principles and theories of environmental chemistry and their application to real-world environmental issues. • Analyze and assess the behavior of environmental pollutants in different environmental compartments, applying concepts of transport, transformation, and fate. • Integrate geospatial and environmental data, conducting spatial analysis and modeling to assess environmental patterns and relationships. • Apply computer applications to solve complex environmental problems and make informed decisions in various environmental domains. • Demonstrate awareness and understanding of emerging technologies and trends in environmental geosciences and computer applications, and their potential applications to environmental research and management.
			5.	**EVSC415**: Environmental Sustainability	• Demonstrate a comprehensive understanding of environmental sustainability, including its theoretical foundations, key concepts, and the interconnections between social, economic, and ecological dimensions. • Possess advanced research skills in environmental sustainability, including the ability to design and execute research projects, collect and analyze data, and communicate research findings effectively. • Critically analyze and evaluate sustainability challenges and opportunities, applying systems thinking and interdisciplinary approaches to identify innovative and sustainable solutions. • Design and implement sustainable management strategies for natural resources, ecosystems, and human systems, integrating social, economic, and environmental considerations.
			6.	**EVSC416:** Solid & Hazardous Waste Management	• Critically analyze waste management challenges and propose appropriate solutions considering environmental, social, and economic factors. • Characterize different types of solid and hazardous wastes accurately. • Interpreting waste management regulations and policies to ensure compliance in waste handling and disposal practices. • Designing waste minimization plans and recycling programs to reduce the environmental impact of waste generation. • Evaluating and select suitable waste treatment technologies based on the characteristics of the waste and the desired outcomes.

		7.	**EVSO413:** On-Job Training	• Students will demonstrate proficiency in applying theoretical knowledge and academic concepts to real-world professional situations. • Students will possess job-specific skills that are relevant to their chosen field of study, enabling them to perform tasks and responsibilities effectively and efficiently. • Students will acquire a comprehensive understanding of industry practices, trends, and challenges, contributing to their overall knowledge and expertise in the field. • Students will establish professional networks and relationships, expanding their professional connections and opportunities for future collaborations and career advancement. • Students will develop problem-solving and critical thinking abilities, demonstrating the ability to analyze complex situations, make informed decisions, and propose effective solutions. • Students will demonstrate professionalism, adaptability, and effective communication skills in a professional work environment.

Evaluation Pattern

SN	Type of Course	Continuous Assessment (CA)	End Examination (EE)
1	Theory (T) **4 Credit** 100 Marks CA: 30% EE: 70%	Each student is required to attempt total 02 (Two) "Continuous Assessments (CAs)" for each course of each Semester, as per the following details: 1. CA01: 'Continuous Assessment 01 (CA01)' on Credit 01 to Credit 04 of each course, consists of • 2 (Two) 'Short Answer Questions (SAQs)', each carrying 05 Marks, on Credit 01 and Credit 02 **and** • 1 (One) 'Long Answer Question (LAQ)' of 10 Marks, on Credit 03 and Credit 04. LAQ may consist of sub-questions. **CA01**: On Credit 01 to Credit 04, of Marks = (5x2 + 10) = **20 Marks** 2. CA02: 'Continuous Assessment 02 (CA02)' on Credit 01 to Credit 04 of each course, consists of • A test containing total **10** (Ten) 'Objective Type Questions, ' 05 (Five) on Credit 01 and Credit 02, and 05 (Five) on Credit 03 and Credit 04. Each 'Objective Type Question' of 1 Mark. **CA02**: On Credit 01 to Credit 04, of Marks = **10 Marks** 3. Maximum number of attempts for **CA,** during each semester :Single attempt only 4. **Total Marks**: **30** Marks	1. Student is required to answer **05 'VSAQs' out of 06 'VSAQs'**, each carrying 03 Marks, on Credit 01 to 04, for total 15 Marks. One VSAQ will be on each Credit. 2. Student is required to answer **05 'SAQs' out of 06 'SAQs'**, each carrying 05 Marks, on Credit 01 to 04, for total 25 Marks. One SAQ will be on each Credit. 3. Student is required to answer **01 'LAQ' out of 2 LAQs,** of 10 Marks on Credit 01 and Credit 02, for total 10 Marks. LAQ may consist of sub-questions. 4. Student is required to answer **01 'LAQ' out of 2 LAQs,** of 10 Marks on Credit 03 and Credit 04, for total 10 Marks. LAQ may consist of sub-questions. 5. Student is required to answer **01 'LAQ' out of 2 LAQs,** of 10 Marks on Credit 01 to Credit 04, for total 10 Marks. LAQ may consist of sub-questions. 6. Number of attempts: Till Valid Registration Period (VRP) only 7. Marks: 70 Marks 8. Duration: 150 minutes

<table>
<tr><th>SN</th><th>Type of Course</th><th colspan="2">Continuous Assessment (CA)</th><th>End Examination (EE)</th></tr>
<tr><td></td><td></td><td colspan="2">
<table>
<tr><th>SN</th><th>Description</th><th>Evaluation of End Examination(EE)</th><th>Marks</th></tr>
<tr><td rowspan="3">1</td><td rowspan="3">Question Types</td><td>Very Short Answer Question (VSAQ) on each Credit</td><td>03 Marks</td></tr>
<tr><td>Short Answer Question (SAQ) on each Credit</td><td>05 Marks</td></tr>
<tr><td>On each Credit, either Single Long Answer Question (LAQ) or LAQ contains sub-questions (a), (b) and so on.</td><td>10 Marks</td></tr>
<tr><td>2</td><td>Grand Total Marks</td><td>Total five Questions in EE Question paper based on:
Credit 01 to 04 : 05 VSAQs out of 06 VSAQs (15 Marks)
Credit 01 to 04 : 05 SAQs out of 06 SAQs (25 Marks)
Credit 01 to 02 : 01 LAQ out of 02 LAQs (10 Marks)
Credit 03 to 04 : 01 LAQ out of 02 LAQs (10 Marks)
Credit 01 to 04 : 01 LAQ out of 02 LAQs (10 Marks)
LAQ may contains sub-questions</td><td>70 Marks</td></tr>
</table>
</td><td></td></tr>
<tr><td>2</td><td>Theory (T)

2 Credit
50 Marks

CA: 30%
EE: 70%</td><td colspan="2">Each student is required to attempt total 01 (One) “Continuous Assessment (CA)” for each course of each Semester, as per the following details:
1. CA01: 1 (One) ‘Continuous Assessment 01 (CA01)’ on Credit 01 and Credit 02 of each course, consists of
• 1 (One) ‘Short Answer Question (SAQ)’ of 5 Marks
and
• 1 (One) ‘Long Answer Question (LAQ)’of 10 Marks, LAQ may consist of sub-questions.
CA01: On Credit 01 and Credit 02, of Marks = (5 + 10) = 15 Marks
2. Maximum number of attempts for CA, during each semester: Single attempt only
3. Total Marks: 15 Marks</td><td>1. Student is required to answer 05 ‘VSAQs’ out of 06 ‘VSAQs’, each carrying 03 Marks, on Credit 01 to 02, for total 15 Marks. One VSAQ will be on each Credit.
2. Student is required to answer 02 ‘SAQs’ out of 03 ‘SAQs’, each carrying 05 Marks, on Credit 01 to 02, for total 10 Marks. One SAQ will be on each Credit.
3. Student is required to answer 01 ‘LAQ’ out of 2 LAQs, of 10 Marks on Credit 01 and Credit 02, for total 10 Marks. LAQ may consist of sub-questions.
4. Number of attempts: Till Valid Registration Period (VRP) only
5. Marks: 35 Marks
6. Duration: 75 minutes</td></tr>
<tr><td></td><td></td><td colspan="2">
<table>
<tr><th>SN</th><th>Description</th><th>Evaluation of End Examination (EE)</th><th>Marks</th></tr>
<tr><td rowspan="3">1</td><td rowspan="3">Question Types</td><td>Very Short Answer Question (VSAQ) on each Credit</td><td>03 Marks</td></tr>
<tr><td>Short Answer Question (SAQ) on each Credit</td><td>05 Marks</td></tr>
<tr><td>On each Credit, either Single Long Answer Question (LAQ) or LAQ contains sub-questions (a), (b) and so on.</td><td>10 Marks</td></tr>
<tr><td>2</td><td>Grand Total Marks</td><td>Total three Questions in EE Question paper based on:
Credit 01 to 02 : 05 VSAQs out of 06 VSAQs (15 Marks)
Credit 01 to 02 : 02 SAQs out of 03 SAQs (10 Marks)
Credit 01 to 02 : 01 LAQ out of 02 LAQs (10 Marks)
LAQ may contains sub-questions</td><td>35 Marks</td></tr>
</table>
</td><td></td></tr>
</table>

<table>
<tr><th>SN</th><th>Type of Course</th><th colspan="2">Continuous Assessment (CA)</th><th>End Examination (EE)</th></tr>
<tr><td>3</td><td>Practical (P)

4 Credit
100 Marks

CA: 50%
EE: 50%</td><td colspan="2">1. Student is required to submit “Activity Report in Work-Book Format” for each Credit in the prescribed format.
2. Maximum number of attempts for each CA, during each semester : Single attempt only
3. Marks: 50 Marks
4. Grading criteria:
<table>
<tr><td>Lab Punctuality, Preparedness & Ethics</td><td>Irregular in lab. Copies the experiment from others (0 Points)</td><td>Consistently regular but unable to explain the concepts (06 Points)</td><td>Punctuality in lab. Follows the procedure and responds to questions asked (10 Points)</td></tr>
<tr><td>Activity Report and Performance

(Experiment No, Date, Objectives, Apparatus with specification, Observations, Graphs, software used if any)</td><td>Poor Documentation and copied the experiment from others. Couldn't perform the Activity /poor observation made (04 Points)</td><td>Average Documentation: Report is in format but some of the formatting guidelines are missed. Performed the Activity but observations made with some mistakes (12 Points)</td><td>Good Documentation: Lab activity writing is in proper format with all references, Grammar. Performed the Activity on time observations made with no mistakes (20 Points)</td></tr>
<tr><td>Results and Conclusion</td><td>Unable to achieve the desired results but makes attempts to relate data to theory. Poor concluding statements (08 Points)</td><td>Average graphical and tabulated representation with misinterpret physical significance of theory. Achieve the desired results and but insufficient conclusion statement. (14 Points)</td><td>Analyses and interpret observed data carefully with good graphical and tabulated representation using appropriate theory/evidence. Achieve the results and reach to appropriate Conclusion (20 Points)</td></tr>
</table></td><td>External and internal examiners shall assess each student based on:
1. Workbook/Activity Report submission by the student (Only by External Examiner) [05 Marks]
2. Practical Activity performed by the student [12 Marks]
3. Result and Conclusion of the Practical Activity [13 Marks]
4. Viva-Voce on Practical Activities [20 Marks]
5. Number of attempts: Till Valid Registration Period (VRP) only
6. Marks: 50 Marks
7. Duration: 180 minutes</td></tr>
</table>

SN	Type of Course	Continuous Assessment (CA)	End Examination (EE)

SN	Evaluation of Practical End Examination		
	Description	Internal Examiner	External Examiner
1	Workbook/Activity Report	-	05 Marks
2	Actual Conduct of one randomly selected Practical Activity	02 Marks	10 Marks
3	Diagram, Synoptic Answers, Graph/Observation and Conclusion	03 Marks	10 Marks
4	Viva-Voce/Oral	05 Marks	15 Marks
5	Total	10 Marks	40 Marks

<table>
<tr><th>SN</th><th>Type of Course</th><th colspan="4">Continuous Assessment (CA)</th><th>End Examination (EE)</th></tr>
<tr><td>4</td><td>Practical (P)

2 Credit
50 Marks

CA: 50%
EE: 50%</td><td colspan="4">1. Student is required to submit “Activity Report in Work-Book Format” for each Credit in the prescribed format.
2. Maximum number of attempts for each CA, during each semester : Single attempt only
3. Marks: 25 Marks
4. Grading criteria:
<table><tr><td>Lab Punctuality, Preparedness & Ethics</td><td>Irregular in lab. Copies the experiment from others
(0 Points)</td><td>Consistently regular but unable to explain the concepts
(06 Points)</td><td>Punctuality in lab. Follows the procedure and responds to questions asked
(10 Points)</td></tr><tr><td>Activity Report and Performance

(Experiment No, Date, Objectives, Apparatus with specification, Observations, Graphs, software used if any)</td><td>Poor Documentation and copied the experiment from others.
Couldn't perform the Activity /poor observation made
(04 Points)</td><td>Average Documentation: Report is in format but some of the formatting guidelines are missed. Performed the Activity but observations made with some mistakes
(12 Points)</td><td>Good Documentation: Lab activity writing is in proper format with all references, Grammar.
Performed the Activity on time observations made with no mistakes
(20 Points)</td></tr><tr><td>Results and Conclusion</td><td>Unable to achieve the desired results but makes attempts to relate data to theory. Poor concluding statements
(08 Points)</td><td>Average graphical and tabulated representation with misinterpret physical significance of theory. Achieve the desired results and but insufficient conclusion statement.
(14 Points)</td><td>Analyses and interpret observed data carefully with good graphical and tabulated representation using appropriate theory/evidence. Achieve the results and reach to appropriate Conclusion
(20 Points)</td></tr></table></td><td>1. External and internal examiners shall assess each student based on:
a. Workbook/Activity Report submission by the student (Only by External Examiner) [05 Marks]
b. Practical Activity performed by the student [06 Marks]
c. Result and Conclusion of the Practical Activity[07 Marks]
d. Viva-Voce on Practical Activities [07 Marks]
2. Number of attempts: Till Valid Registration Period (VRP) only
3. Marks: 25 Marks
4. Duration: 180 minute</td></tr>
</table>

<table>
<tr><th>SN</th><th>Type of Course</th><th colspan="2">Continuous Assessment (CA)</th><th colspan="3">End Examination (EE)</th></tr>
<tr><td></td><td></td><td></td><td colspan="4"><table>
<tr><td rowspan="2">SN</td><td colspan="3">Evaluation of Practical End Examination</td></tr>
<tr><td>Description</td><td>Internal Examiner</td><td>External Examiner</td></tr>
<tr><td>1</td><td>Workbook/Activity Report</td><td>-</td><td>05 Marks</td></tr>
<tr><td>2</td><td>Actual Conduct of one randomly selected Practical Activity</td><td>01 Marks</td><td>05 Marks</td></tr>
<tr><td>3</td><td>Diagram, Synoptic Answers, Graph/Observation and Conclusion</td><td>02 Marks</td><td>05 Marks</td></tr>
<tr><td>4</td><td>Viva-Voce/Oral</td><td>02 Marks</td><td>05 Marks</td></tr>
<tr><td></td><td>Total</td><td>05 Marks</td><td>20 Marks</td></tr>
</table></td><td></td></tr>
</table>

<table>
<tr><th>SN</th><th>Type of Course</th><th colspan="2">Continuous Assessment (CA)</th><th>End Examination (EE)</th></tr>
<tr><td>5</td><td>Term Work (TW)

2 Credit
50 Marks

CA: 50%
EE: 50%</td><td colspan="2">1. Student is required to submit “Activity Report in Work-Book Format” for each Credit in the prescribed format.
2. Maximum number of attempts for each CA, during each semester : Single attempt only
3. Marks: 25 Marks
4. Grading Criteria:
<table>
<tr><td>Lab Punctuality, Preparedness & Ethics</td><td>Irregular in lab. Copies the experiment from others
(0 Points)</td><td>Consistently regular but unable to explain the concepts
(03 Points)</td><td>Punctuality in lab. Follows the procedure and responds to questions asked
(05 Points)</td></tr>
<tr><td>Activity Report and Performance

(Experiment No, Date, Objectives, Apparatus with specification, Observations, Graphs, software used if any)</td><td>Poor Documentation and copied the experiment from others. Couldn't perform the Activity /poor observation made
(02 Points)</td><td>Average Documentation: Report is in format but some of the formatting guidelines are missed. Performed the Activity but observations made with some mistakes
(06 Points)</td><td>Good Documentation: Lab activity writing is in proper format with all references, Grammar. Performed the Activity on time observations made with no mistakes
(10 Points)</td></tr>
<tr><td>Results and Conclusion</td><td>Unable to achieve the desired results but makes attempts to relate data to theory. Poor concluding statements
(04 Points)</td><td>Average graphical and tabulated representation with misinterpret physical significance of theory. Achieve the desired results and but insufficient conclusion statement.
(07 Points)</td><td>Analyses and interpret observed data carefully with good graphical and tabulated representation using appropriate theory/evidence. Achieve the results and reach to appropriate Conclusion
(10 Points)</td></tr>
</table></td><td>1. External and internal examiners shall assess each student based on:
a. Workbook/Activity Report submission by the student (Only by External Examiner) [05 Marks]
b. Viva-Voce on Practical Activities [20 Marks]
2. Number of attempts: Till Valid Registration Period (VRP) only
3. Marks: 25 Marks
4. Duration: 180 minutes</td></tr>
</table>

<table>
<tr><th>SN</th><th>Type of Course</th><th colspan="2">Continuous Assessment (CA)</th><th>End Examination (EE)</th></tr>
<tr><td></td><td></td><td colspan="2"><table>
<tr><td rowspan="2">SN</td><td colspan="3">Evaluation of Practical End Examination</td></tr>
<tr><td>Description</td><td>Internal Examiner</td><td>External Examiner</td></tr>
<tr><td>1</td><td>Workbook/Activity Report</td><td>-</td><td>05 Marks</td></tr>
<tr><td>2</td><td>Viva-Voce/Oral</td><td>05 Marks</td><td>15 Marks</td></tr>
<tr><td></td><td>Total</td><td>05 Marks</td><td>20 Marks</td></tr>
</table></td><td></td></tr>
<tr><td>6</td><td>Field Project (TW)

2 Credit
50 Marks

CA: 50%
EE: 50%</td><td colspan="2">Students need to complete Field Project (Total Study hours 60 hrs including Activity Report). After completion of the field project, learners shall submit a report to the LSC - Programme Coordinator (PC) and Mentor/Guide.
1. Maximum number of attempts for each CA, during each semester: Single attempt only
2. Duration: Minimum 15 days or 2 Weeks duration – Any month during the semester
3. Marks: 25 Marks
4. Grading Criteria for Evaluation of FP (only by Mentor/Guide):
<table>
<tr><td>SN</td><td>Description</td><td>Marks</td></tr>
<tr><td>1</td><td>Key Definitions of Problem area and analysis of preliminary data</td><td>05</td></tr>
<tr><td>2</td><td>Work related to formats, Correspondence, Interactions and liaising etc</td><td>05</td></tr>
<tr><td>3</td><td>Field work and data collection</td><td>05</td></tr>
<tr><td>4</td><td>Analysis and Report</td><td>05</td></tr>
<tr><td>5</td><td>Feedback to community</td><td>05</td></tr>
<tr><td colspan="2">Total</td><td>25</td></tr>
</table></td><td>1. External and Internal examiners (Internal examiner - Programme Coordinator (PC) / Supervisor of LSC) shall assess each student based on:
a. Activity Report submission by the student (Only by External Examiner) [05 Marks]
b. Viva-Voce on Activity Report [20 Marks]
2. Number of attempts: Till Valid Registration Period (VRP) only
3. Marks: 25 Marks
4. Duration: 180 minutes</td></tr>
<tr><td></td><td></td><td colspan="2"><table>
<tr><td rowspan="2">SN</td><td colspan="3">Evaluation of Field Project End Examination</td></tr>
<tr><td>Description</td><td>Internal Examiner (Programme Coordinator (PC)/ Supervisor of LSC)</td><td>External Examiner</td></tr>
<tr><td>1</td><td>Workbook/Report submission</td><td>-</td><td>05 Marks</td></tr>
<tr><td>2</td><td>Viva-Voce /Oral</td><td>05 Marks</td><td>15 Marks</td></tr>
<tr><td>3</td><td>Total</td><td>05 Marks</td><td>20 Marks</td></tr>
</table></td><td></td></tr>
</table>

<table>
<tr><th>SN</th><th>Type of Course</th><th>Continuous Assessment (CA)</th><th>End Examination (EE)</th></tr>
<tr><td>7</td><td>OJT or Internship (TW)

4 Credit
100 Marks

CA: 50%
EE: 50%</td><td>
1. Students need to complete one month On Job Training (OJT) or Internship (Total Study hours 120 hrs including Internship Report) in any Industry/Organization/Institute/ R&D Division /Any Micro/ Small/ Medium/ enterprise/Govt/NGO/PSU/Online Internship related to major course.
2. Maximum number of attempts for each CA, during each semester: Single attempt only
3. Marks: 50 Marks
4. Duration: 1 Month or 4 Weeks –
Any one month within semester duration, but before end examination of that particular semester
5. Grading Criteria for Evaluation of OJT (or Intern) only by Mentor where the Internship is proposed to be imparted:
<table>
<tr><th>SN</th><th>Parameters</th><th>Marks Out of</th></tr>
<tr><td>1</td><td>Behaviors, Shows interest in assigned work, Willingness to learn</td><td>10</td></tr>
<tr><td>2</td><td>Accepts responsibility, Cooperates with co-workers and supervisors, Demonstrates organizational skills</td><td>10</td></tr>
<tr><td>3</td><td>Uses time, knowledge and expertise effectively, Analyzes problems effectively</td><td>10</td></tr>
<tr><td>4</td><td>Demonstrates creativity/ originality / any innovative contribution, Professional ethics and accountability</td><td>10</td></tr>
<tr><td>5</td><td>Writes effectively, Produces high quality work/Skill Proficiency</td><td>10</td></tr>
<tr><td colspan="2">Total</td><td>50</td></tr>
</table>
Document as Evidence: Activity report along with Certificate or Declaration, duly issued and signed by the concerned authority [To be assessed during EE] should be submitted during End Examination to the parent Learner support Centre (LSC).
</td><td>
At the end of second semester, Programme Coordinator (PC)/ Supervisor of LSC and 1 (one)External Examiner will complete ‘End Exam (EE)’ for all allotted students as follows:
1. Duration of EE: After Theory EE of second Semester
2. Programme Coordinator (PC)/ Supervisor of LSC and External Expert will have 20% and 80% weightage respectively in EE.
3. Number of attempts: Till Valid Registration Period (VRP) only
4. Marks for EE: 50 Marks
<table>
<tr><th>Parameter</th><th>PC /Supervisor of LSC</th><th>External Expert</th></tr>
<tr><td>Professional Attitude</td><td>-</td><td>05 Marks</td></tr>
<tr><td>Maintenance of Daily Diary</td><td>-</td><td>10 Marks</td></tr>
<tr><td>Internship Report</td><td>05 Marks</td><td>10 Marks</td></tr>
<tr><td>Viva/Oral</td><td>05 Marks</td><td>15 Marks</td></tr>
<tr><td>Total</td><td>10 Marks</td><td>40 Marks</td></tr>
</table>
</td></tr>
</table>

<table>
<tr><th>SN</th><th>Type of Course</th><th>Continuous Assessment (CA)</th><th>End Examination (EE)</th></tr>
<tr><td rowspan="2">8</td><td rowspan="2">CEP (TW)

2 Credit
50 Marks

CA: 50%
EE: 50%</td><td>1. CEP Proposals*: 15 Marks

2. Planning community work, correspondence, formats, interactions, liaising: 10 Marks
Marks: 25 Marks</td><td>1. CEP report**: 15 marks

2. Viva /Presentation: 10 Marks
Marks: 25 Marks</td></tr>
<tr><td colspan="2">*CEP Proposals: 1) Basic structure of Society
2) Key definitions of Problem area
3) Analysis of Preliminary data

**CEP Report: 1) Field work and data gathering
2) Analysis and reporting</td></tr>
</table>

Appendix IV

Entry level qualification to B. Sc. (Honours) programmes

SN	Academic Qualifications Required for Eligibility		
A)	A candidate who has passed Standard 12th / (10+2)th / Level 4.0 examination conducted by Maharashtra State Board of Secondary and Higher Secondary Education/CBSE/ ISC/NIOS or equivalent examinations by any Other State or any other recognised Board with science subjects shall be eligible for admission to First Semester B. Sc. Programmes as per NEP 2020		
	Groups of Science subjects/courses from		**Eligible for Any One Major in Science Discipline**
1.	1. English 2. Physics, Chemistry, Mathematics, Biology		**Any One Major from**: Environmental Science
2.	1. English 2. Physics, Chemistry, Mathematics		**Any One Major from:** Environmental Science
3.	1. English 2. Physics, Chemistry, Biology		**Any One Major from**: Environmental Science
4.	1. English 2. Vocational Course of 200 Marks 3. Physics, Chemistry, Mathematics		**Any One Major from:** Environmental Science
5.	1. English 2. Vocational Course of 200 Marks 3. Physics, Chemistry, Biology		**Any One Major from**: Environmental Science
6.	1. English 2. Physics, Chemistry 3. Any one of the following Optional Course of 100 Marks : Geography, Geology, Food Science and Technology, Agriculture Science and Technology, Animal Science and Technology, Defence Studies		**Any One Major from**: Environmental Science
	OR		
B)	A candidate who has passed (10+3) years or (12+2) years Diploma from Maharashtra State Technical Board / a statutory or recognized board/ university in India		
	Description		**Eligible for Any One Major in Science Discipline**
1.	(10+3) years / (12+2) years Engineering Diploma		**Any One Major from:** Environmental Science
	OR		
C)	A candidate who has passed Higher Secondary School Certificate (10+2) Examination with English and any of the following +2 Level HSC Vocational (MCVC) Group		
	HSC Vocational (MCVC) Group		**Eligible for Any One Major in Science Discipline**
1.	Agriculture Group or Fisheries Group	Horticulture (KA, KB, KC)	**Any One Major from:** Environmental Science
		Crop Science (LA, LB, LC)	
		Animal Husbandry and Dairy Technology (MA, MB, MC)	

SN	Academic Qualifications Required for Eligibility		
		Fisheries Technology (NA, NB, NC)	
2.	Catering and Food Products Technology	Catering and Food Products Technology (SA, SB, SC)	**Any One Major from:** Environmental Science
3.	Paramedical Group	Child, Old Age and Health care services (QA, QB, QC)	**Any One Major from:** Environmental Science

END OF DOC

DEB-UGC application for Programme approval for AY 2025-26

School of Sciences, YCMOU Nashik

(Formerly School of Architecture, Science and Technology)

Programme Project Report (PPR)

M.Sc. (Mathematics with Computer Applications)

Programme: V157: M.Sc. (Mathematics with Computer Applications) {2025 Pattern}

A. **Programme project report** (PPR)

Name of Program :		
a	Programme's mission & objectives	Programme's mission: Master of Science in Mathematics with Computer Applications Programme has been designed to provide advanced knowledge in mathematics with a focus on applying computational techniques to solve mathematical problems to those students who are not having opportunity to study in regular mode and for drop-out students from rural and urban areas. This interdisciplinary approach equips students with both theoretical knowledge and practical skills, blending mathematical theory with computer science methodologies. This programme is offered to meet current needs of aspiring youths and adult population and also create awareness about the basic as well as advanced Mathematical aspects to the society. This Programme aims at creating equity in education by providing opportunity to rural people for whom Higher Education is unreachable. This programme has the following broad objectives: • To prepare the learners, who will understand and apply the basic as well as advanced principles of mathematics for solving problems from science with an emphasis on applications • To develop a deep understanding of advanced mathematical concepts, theories, and techniques of Quantum Computing and Statistics. • To integrate mathematical principles with computer applications to solve complex problems in various fields. • To enhance analytical and problem-solving skills using mathematical modeling and computational techniques. • To prepare students for research and development careers in academia, industry, or government sectors. • To encourage interdisciplinary collaboration by applying mathematical tools to diverse areas such as engineering, finance, physics, biology, and more. • To gain proficiency in using mathematical software tools and programming languages for mathematical modeling,

		simulation, and data analysis. • To provide exposure and motivate students for research in current trends of mathematics.
b	Relevance of the program with HEI's Mission and Goals	Objects of the YCMOU (as per the YCMOU Act) which would be fulfilled by implementing the proposed program (a) To provide through instruction, teaching and training and other educational opportunities, access to larger and larger segment of population, and in particular to the disadvantaged groups such as those living in remote and rural areas including working people, housewives and other adults who wish to upgrade or acquire knowledge through studies in various fields; [1(a)] (b) To strengthen and diversify the degrees, diploma and certificate courses at various educational levels, to fulfil the knowledge, skills and development needs of the individuals, institutions and society in general, by relating, particularly, the courses, to the needs of the employment and economic development of the state on the basis of its natural and human resources; [1(b)] (c) To promote acquisition of knowledge in a rapidly developing and changing society and to continually offer opportunity of upgrading knowledge, training and skills in the context of innovations, research and discovery in all field of human endeavour by developing educational network with the use of modern communication media and technologies appropriate for a learning society; [1(c)] (d) To provide an innovative system of university level education, flexible and open, in regard to the methods and pace of learning, combination of courses, eligibility for enrolment, age of entry, conduct of examinations and operation of the program, with a review to promote learning and encourage excellence in all fields of knowledge; [1(d)] (e) To contribute to the improvement of the education system in the state by providing a non-formal channel complementary to the formal system and encouraging transfer of credits and exchange of teaching staff by making a wide use of text and other software developed by the University; [1(e)] (f) To develop innovative, need based Vocational courses and establish industry, institution linkage for developing the society; [1(f)] (g) To provide through incidental and non-formal means, for continuing and extension of education in various cultural forms, arts, crafts and skills of the country, raising their quality and improving their availability to the people; [1(g)] (h) To provide for the counselling and guidance to its students; [1(j)] (i) To provide major part of its resources and direct efforts in designing, developing and offering need-based and relevant vocational courses. [1(l)]

c	Nature of prospective target group of learners	In-Service Science Teachers from Schools/ Junior College and Equivalent pass students. **Admission Eligibility**: Any B.Sc. with Maths upto Second year/ BA with Maths/ BE/ B.Tech. or equivalent pass Although, similar PG Program on offer from the conventional institutes, conventional educational system offers very little freedom to learners as regards to when, where, how to learn. Proposed Program aims to provide this freedom to learners to the maximum possible extent.
d	Appropriateness of programme to be conducted in Open and Distance Learning mode to acquire specific skills and competence	The proposed programme is designed in adherence to the principles of National Education Policy (NEP2020) to acquire knowledge and skills with valuable experiences through hands-on activities, projects, internships and much more. This aims to provide relevant skills as needed by the working professional to identify and solve challenging problems in Mathematics, thus contributing to the ever-increasing demands of society and industry. The programme helps to develop scientific tempers and attitudes, which in turn can prove beneficial for society since scientific developments can make a nation or society grow at a rapid pace. After studying this programme, learners will be better equipped to learn and have a deep understanding of key Mathematical concepts, principles, and theories relevant to the field of Computer Applications and are prepared to take on leadership roles in governmental agencies, research institutions, and industries related to Mathematics with Computer Applications. This programme uses the Open and Distance (ODL) mode of education in compliance with the objective 'reach to unreach' by offering: Theory, Practical, Term-work, Field Project/OJT, courses. The teaching-learning component is offered as face-to-face counseling along with full practical and project-work activities by qualified and experienced teacher/ mentors/experts at a recognized Learner Support Center (LSC), along with continuous assessment, and offline materials and resources in printed book format or soft copy format. Additionally, this programme adheres all of the prevalent academic norms and standards of the UGC-DEB. Hence, this programme is appropriate to conduct in open and distance learning modes to provide an opportunity for those aspirants who cannot take traditional education but want to improve their existing science skills and/or to acquire specified skills and competencies.
e	Instructional Design **1.** Curriculum Design (***Outcome of Expert Committee meeting; Program Structure: specify the theory, practical, fieldwork, project, etc components***)**:**	**1. Curriculum Design and 2. Total Credit Points:** a. **Total Courses:** Total 23 courses (subjects) distributed over Semesters 01 to 04. b. **Total Credits:** 88 Credits [As per UGC norms 1 Credit means 30 hours of study efforts required to gain learning of content of each credit]. c. **Total Courses and Credit Distribution Scheme:**

2. Total Credit Points (*including course wise*):
3. Detailed Syllabi:
4. Duration of the program (***Minimum & Maximum***)**:**
5. Medium of Instruction:
6. Type of Program (***General/Technical/ Professional***)**:**
7. Faculty and Support Staff:
8. Instructional Design & Delivery Mechanism (***Media to be used - print, audio, video, online, computer aided, web based, etc. (course wise)***)**:**
9. Student Support Service System (***Specify the provisions to be made at Head Quarter, Regional Centers, Learner Support Centers and Web based, etc***)**:**

Sem	Mandatory Courses (DSC)			Elective Courses (DSE) (4 Credits)	Other Courses (4 Credits)/ (6 Credits)	Total Courses (Credits)
	Theory		Practical (4 Credits)			
	(4 Credits)	(2 Credits)				
1	2	1	1	1	1 – Research Methodology (4 Credits)	**6** (22 Credits)
2	2	1	1	1	Any one - OJT/ Field Projects (4 Credits)	**6** (22 Credits)
3	2	1	1	1	1- Research Project (4 Credits)	**6** (22 Credits)
4	2	-	1	1	1- Research Project (6 Credits)	**5** (22 Credits)
Total	8 x4= (32 Credits)	3 x2= (6 Credits)	4x4= (16 Credits)	4x4= (16 Credits)	4x3+1x6= (18 Credits)	23 (88 Credits)

d. **Programme Structure:**

SN	Code	Course Name	CA	EE	TM	Type	CR	Min %
[Level 6.0] Semester 01: 22 Credits								
01	MAT501	Real Analysis	30	70	100	T	4	40%
02	MAT502	Abstract Algebra	30	70	100	T	4	40%
03	MAT503	Ordinary Differential Equations	15	35	50	T	2	40%
04	MAT611	Programming in Python	50	50	100	P	4	40%
05	RES505	Research Methodology	30	70	100	T	4	40%
Elective (DSE) Courses (Select Any One)								
06	MAT506	Operations Research	30	70	100	T	4	40%
07	MAT515	Number Theory	30	70	100	T	4	40%
08	MAT508	Introduction to Probability and Statistics	30	70	100	T	4	40%
[Level 6.0] Semester 02: 22 Credits								
09	MAT509	Topology	30	70	100	T	4	40%
10	MAT510	Linear Algebra	30	70	100	T	4	40%

11	MAT511	Partial Differential Equations	15	35	50	T	2	40%
12	MAT512	LaTex and Programming in SageMath	50	50	100	P	4	40%
13	MAT513 MAT514	Any one OJT or FP OJT FP	50	50	100	TW	4	40%
14								
14	MAT507	Numerical Analysis	30	70	100	T	4	40%
15	MAT518	Field and Coding Theory	30	70	100	T	4	40%
16	MAT519	Statistical Inference	30	70	100	T	4	40%
Exit option: PGD 9- MAT (44 Credits) after Three Year UG Degree								
[Level 6.5]Semester 03: 22 Credits								
17	MAT601	Complex Analysis	30	70	100	T	4	40%
18	MAT616	Machine Learning	30	70	100	T	4	40%
19	MAT617	Introduction to Artificial Intelligence	15	35	50	T	2	40%
20	MAT618	Practical on AI & ML	50	50	100	P	4	40%
21	MAT605	Research Project	50	50	100	PW	4	40%
Elective (DSE)Courses (Select Any One)								
22	MAT619	Design and Analysis of Algorithm	30	70	100	T	4	40%
23	MAT620	Foundation of Quantum Computing	30	70	100	T	4	40%
24	MAT621	Time Series Analysis	30	70	100	T	4	40%
[Level 6.5] Semester 04: 22 Credits								
25	MAT606	Discrete Mathematics	30	70	100	T	4	40%
26	MAT622	Introduction to Data Science	30	70	100	T	4	40%
27	MAT623	SQL for Data Science	50	50	100	P	4	40%
28	MAT612	Research Project	75	75	150	PW	6	40%
Elective (DSE)Courses (Select Any One)								

29	MAT613	Cryptography	30	70	100	T	4	40%
30	MAT624	Quantum Computing Algorithm	30	70	100	T	4	40%
31	MAT625	Theory of Computations	30	70	100	T	4	40%

2. Detailed Syllabi:

Will be Available at University website:
https://drive.google.com/drive/folders/13lNyj1PT7qN-AAAi2eE8fwDAsCQFWMQz?tid=0B451Yjwt_acQR1VPSUQ4Q0tvams

- Curriculum updation will be after every 3 years
- Programme Outcomes and Course Outcomes: Refer Appendix - I

3. Duration of the program (*Minimum & Maximum*):

- **Minimum Programme Duration**: 2 years/ 4 semesters after any B.Sc. with Maths upto Second year/ BA with Maths/ BE/ B.Tech. or equivalent pass
- **Maximum Programme Duration:** 4 years from the date of admission to the PG programme, also referred as Valid Registration Period.

4. Medium of Instruction: English

5. Type of Program (*General/Technical/ Professional*): General

6. Faculty and Support Staff:

Dr. Chetana Kamlaskar (Director, School of Sciences) and
Ms. Tejaswi Kadam (Academic Coordinator - Mathematics)

7. Instructional Design & Delivery Mechanism:

a. **Teaching-Learning:** Total 12 + 3 = 15 working weeks in each semester, where 3-weeks' time duration in each semester for clearing face-to-face counseling session's backlog (if any).

b. **Total Teaching-Learning Support:** Total 2640 Hours including Self-Study during all 4 semesters. 660 Hours (including Self-Study) **during** each semester.

c. **Minimum number of face-to-face counseling sessions:**

- For each course of 2 credits: 6
- For each course of 4 credits: 12
- For each course of 6 credits: 18

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<td>(For each theory type of course duration of each counseling session shall be 01 Clock Hour and

For each Practical/Project type of course duration of each counseling session shall be 02 Clock Hour)

d. Attendance: Minimum 80 % attendance recommended for all activity type of courses

e. Book: Book in SLM format for each course (Free Download from University website) at all semesters 01 to semester 04

8. Student Support Service System:

At headquarter: Support from School, SSD, Evaluation Division and Exam Unit-3

At Regional Centers: From all 8 regional centers within MH

At Learner Support Centers: Recognized Learner support centers within MH

Web Based: http://ycmou.digitaluniversity.ac, http://ycmou.ac.in</td>
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<tr>
<td>f</td>
<td>Procedure for admissions, curriculum transaction and evaluation
1. Define the Admission Policy (including web based tools to be adopted:
2. Eligibility Criteria:
3. Fee Structure:
4. Financial Assistance to Learners (if any):
5. Activity planner of all academic activities of the academic session:
6. Policy for Evaluation of learner progress along with methods and tools:</td>
<td>All information related to the programme like admission policy, eligibility and fee structure, course curriculum, medium of instruction, evaluation policy - online home assignments and end examination pattern, SLMs etc. are transacted through prospectus, university website and official notification.
1. Admission Policy: A customized “Online Annual Admission system” available at DU portal http://ycmou.digitaluniveristy.ac .

Online payment facility is made available using a credit card or debit card or internet banking.

2. Eligibility Criteria: Any B.Sc. with Maths upto Second year/ BA with Maths/ BE/ B.Tech. or equivalent pass

3. Fee Structure:
Annual Admission Form Amount (AAFA) is payable to university along with admission form at the start of each year.
<table>
<tr><th colspan="2">Description</th><th>INR ₹</th></tr>
<tr><td colspan="2"></td><td>1st yr</td><td>2nd yr</td></tr>
<tr><td colspan="2">Mandatory Fee (MF)</td><td>608</td><td>958</td></tr>
<tr><td rowspan="2">Tuition Fee</td><td>USF</td><td>8000</td><td>8000</td></tr>
<tr><td>LSCF</td><td>12000</td><td>12000</td></tr>
<tr><td colspan="2">End Exam Fee (EEF)</td><td>2480</td><td>2370</td></tr>
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Total (AAFA)	**23,088**	**23,328**

Note: Will be updated as per University Policy Decision

4. Financial Assistance to Learners (if any):NA

5. Activity planner:

SCHOOL OF SCIENCES PROGRAMME CALENDAR

Note: This University and School will follow the Programme Calender declared by UGC/DEB New Delhi time to time.

Teaching-Learning of students shall start from 01-September/01-Feb every year.

SN	Activity Description	Yearly Pattern/Odd semesters like 01, 03, 05 and 07 From 01-Sep Till 31-Jan	Even semesters like 02, 04, 06 and 08 From 01-Feb Till 31-Jul
Online Admission: offered on Annual basis for 2 semesters in each academic year. Only for 'C149: Certificate progarmme in Beekeeping', Admissions shall be offered on Winter and Summer batch basis.			
01	Fresh and Further Yearly Admission	From June/ July Till Aug (For C149,Winter Batch: From Jul)	NA (For C149, Summer Batch: From Jan)
Teaching – Learning at the resp Learning Support Centers/ SCs for all Theory, Practical, Term-Work, Studio & Project Courses			
02	Teaching – Learning (16 Weeks) & Backlog Clearing	**From 01-Sep Till 30-Nov**	**From 01-Feb Till 23-May**
Online End Exam (EE) Form Submission (Required only for Repeater Students)			
03	**Online** EE Form Submission by SCs/ students at University	On or Before 21-Oct	On or Before 23-Apr
Continuous Assessment (CA) Submission			
05	CA Availability	From 01-Sep Till 30-Nov	From 01-Mar Till 23-May
06	CA Submission by Students	From 01-Nov Till 30-Nov	From 01-May Till 31-May
End Examination (EE)			
07	**End Exam for Theory Courses**	**From 1-Dec to 10-Dec**	**From 25-May to 05-Jun**
08	EE for Activity Courses (Pr, TW, PW, STW, SV)	Immediately after/ before the schedule of the end exam for theory courses, but positively before 15-Dec	Immediately after/ before the schedule of the end exam for theory courses, but positively before 15-Jun
10	End Exam Result Declaration	On or Before 31-Jan	On or Before 31-Jul
Semester End Vacation			
11	Semester End Vacation	Jan	July

6. Evaluation Policy:

- **"Evaluation Pattern"**: As per NEP2020, the 'Evaluation Pattern' of the Post graduate Programme consists of the following components:

Course Type	No. of Credits	Continuous Assessment (CA)	End Examination (EE)	Total Marks 'TM' = (CA+EE)	Minimum Passing %
Theory	4	30	70	100	minimum

(T)					40% in CA, EE and (CA + EE) shall be essential for each course to pass
Theory (T)	2	15	35	50	
Practical (P)	4	50	50	100	
OJT/Field Project (FP)	4	50	50	100	
Research Project (RP)	4	50	50	100	
Research Project (RP)	6	75	75	150	

- Separate and independent passing @ 40% in CA, EE and (CA+EE) shall be essential for each course - Theory, Practical, OJT/FP and RP."CA, EE and Total marks" shall be separately reported for each course in the transcript or mark-statement. The minimum and maximum marks for "CA, EE and Total Marks" are shown in the table below. If student does not score a minimum of 40% marks in CA or in EE of a course then the result of such a course will be reported as FAIL.

Course Type	**Number of Credits**	**Continuous Assessment (CA)**	**End Examination(EE)**			**Total Marks 'TM' = (CA +EE)**	
		Min	**Max**	**Min**	**Max**	**Min**	**Max**
Theory	2	6	15	14	35	20	50
	4	12	30	28	70	40	100
Practical/ OJT/FP/ RP	4	20	50	20	50	40	100
	6	30	75	30	75	60	150

- In each semester, only 1 attempt, for CA for each course and for EE for each course shall be allowed. Only during valid registration period (VRP), students are allowed to appear for CA and EE for each course against the payment of the specified 'Examination Fee' for each attempt, for each course where he/she is admitted by the university. The 'CA and/or EE' attempts are counted for each examination option offered by the university to the student, irrespective of whether student actually chooses to appear in end exam or not.
- If a student does not successfully complete the continuous assessment (CA) or pass the End Examination of Practical/Term work/OJT/Field Project/Research Project courses, they may complete these requirements with the next semester at the respective Learning

		Support Center (LSC) only during the valid registration period (VRP). • Duration for Practical/Term work/OJT/Field Project/Research Project type of Courses: 180 Minutes for a batch of typically 15 ± 3 students • Only best of past performance shall be reported in transcript or mark statement. • Total student evaluation for a. Each semester shall be for 550 marks b. Each year shall be for 1100 marks c. Each regular PG degree shall be for 2200 marks • Reporting Semesters for certification: Min 40% or better marks in total 23 courses (subjects) of total 88 credit points at Semesters 01-04. **Detail Evaluation Pattern is available at:** https://drive.google.com/drive/folders/1jtM1b-t_lO04apxNkfZCufdz3IPCkhnB?tid=0B451Yjwt_acQR1VPSUQ4Q0tvams Or **Refer Detail Evaluation pattern given in Appendix II.**
g	Requirement of the laboratory support and Library Resources	Laboratory requirement and Library Resources – Yes. Institutes/Colleges affiliated with conventional university offering M.Sc. (Mathematics) will be only recognized as a Learner support center of this university for this programme. So, requirement of laboratory support and library resources will be automatically ensured. Additionally, school provides practical workbook in the form SLM book and other learning resources to all enrolled learners. University has already initiated in-house Science Laboratory development task at HQ, these labs will be made available to the enrolled learners in future. **Recommended:** Recognized LSCs with • Computer infrastructure with Wi-Fi /broadband connection with Mathematics related software/tool and library facilities.
h	Cost estimate of the programme and the provisions	Budget provision for this development under A.27.P.38: Fees/Royalties/ Honorarium to Writer/Editors/Trans.
i	Quality assurance mechanism and expected programme outcomes	M.Sc. (Mathematics with Computer Applications) programme is designed to provide scientific as well as professional level competency to learners, and offers advanced theoretical as well as practical knowledge to learners. This programme enables the learner to develop interest in knowing more about the Mathematics and to develop research attitude. University has policy to review and revise every course at least once in five years of its launching. **Quality Assurance Mechanism:** The following key result areas will be closely monitored. • Well qualified and experienced experts nomination on

		Programme Advisory Committee(PAC) for design and development of relevant course content • Well qualified subject experts for SLM development and Evaluation task • Enrolment of student (Equated Access) • Equal weightage for each credit in learner evaluation • Demonstrate in-depth knowledge of Mathematics, both in theory and practical • Examination Results • Placements/satisfaction of passing out students • Administrative/stakeholder feedback • Centre for Internal Quality Assurance (CIQA) to ensure quality of offered science programmes **Expected Program Outcomes:** After successful completion of this programme, students will be able to • Demonstrate a profound understanding of advanced mathematical concepts, including calculus, algebra, differential equations, discrete mathematics, and numerical analysis. • Proficiently use various computer applications and programming languages to solve mathematical problems, analyze data, and implement algorithms. • Possess strong analytical and problem-solving skills, capable of tackling complex real-world problems by applying mathematical and computational techniques. • Equip with the necessary research skills to conduct independent research, publish papers, and contribute to the advancement of mathematical and computational sciences. • Apply mathematical techniques and computational methods to interdisciplinary fields, fostering innovation and collaboration across different domains.

B. **Duration & Nomenclature**

Name of Programme :-	M.Sc. (Mathematics with Computer Applications)
Medium	English
Year	2025
Level	PG 6.0
Academic Session	July onwards, AY2025-26
Entry Qualification (as per the Specification of Degrees, 2014)	Any B.Sc. with Maths upto Second year/ BA with Maths/ BE/ B.Tech. or equivalent pass
Duration (as per the Specification of Degrees, 2014)	2 Year
Name of the Department	School of Sciences

C. **Mode of Evaluation**

Year	2025
Whether Weightages to continuous assessment and end semester examinations or term end examinations as per clause mentioned in Regulations	Yes 1. 30% - 70% weightage Pattern for theory 2. 50% - 50% Weightage pattern for Practical/OJT/FP/RP
Examination Scheme	Formative and Summative
Percentage of Continuous Assessment (%)	Theory: 30% Practical/OJT/FP/RP: 50%
Percentage of Term End Examination (%)	Theory: 70% Practical/OJT/FP/RP: 50%
Pass or Fail Criteria 40%	Yes
Pass/Fail Criteria (% Pass Marks)	40% and above - Pass Below 40 % - Fail

D. Mode of Examination

Whether examination through Online (For ODL Programs)	No

E. SLM Development (Submit all SLM in pdf in pendrive and prepare the SLM availability sheet in the order as per sample in pdf for each program separately)

Particulars	% SLM in house developed	% SLM in collaboration with with HEI(It should not be more than 40% of total SLM .If it is in collaboration then provide MOU in Soft & Hard copy
Printing Material	-	-
Audio-Video Material	-	-
Online Material	Yes [pdf of SLMs]	-
Compute based Material	-	-

F. Program wise faculty details (Requirement of Minimum three faculties not below the rank of Assistant Professor to be furnished in the following format: – to be taken from Establishment

Sr. No.	Emp. No	Name of the Faculty	Designation	Date of Joining	Qualification	Specialization	Teaching experience	Address	Phone no	Email	Appointment letter
1	0907	Ms. Tejaswi Kadam	Academic Coordinator	12/10/2018	M.Sc. Mathematics, SET	Mathematics	6 Year	Nashik	9527359061	tejaswikadamindia@gmail.com	
2											
3											

G. List of Learner Support Centres Program wise and Region wise to be submitted as per following format. (We have intimated the same to Director SSD. **You are requested to give him the list of programs for which the LSCs data is required.**) – To be taken from SSD Director

Sr. No	Study centre code	Name & Address of LSC	Name of the HEI to which college/Institute is affiliated (where LSC is established)	Whether the College /Institute Private or Govt. (where LSC is established)	Name and Contact Details of Coordinator/ counsellor :	Qualification of Coordinator/ Counsellor :	No. of Counsellor :	Name of Proposed Programmes/ Course from July, 2023 onwards:	Approved	Not Approved with Reason

Appendix - I

Programme Objectives, Scope of the Programme & Programme Outcomes (PO)

And Course Outcomes (CO)

Programme Name: Master of Science (Mathematics with Computer Applications)		
1	**Programme Objectives**	This programme has the following broad objectives: • To develop a deep understanding of advanced mathematical concepts, theories, and techniques. • To integrate mathematical principles with computer applications to solve complex problems in various fields. • To enhance analytical and problem-solving skills using mathematical modeling and computational techniques. • To prepare students for research and development careers in academia, industry, or government sectors. • To encourage interdisciplinary collaboration by applying mathematical tools to diverse areas such as engineering, finance, physics, biology, and more. • To gain proficiency in using mathematical software tools and programming languages for mathematical modeling, simulation, and data analysis.
2	**Scope of the Programme**	After successful completion of the M.Sc. programme, the learner has ample opportunities to use their mathematical knowledge in different areas: • Academia: Post Graduates can pursue further studies or research positions in academia, contributing to the advancement of mathematical and computational sciences through teaching and research. • Industry: Post Graduates can work in various industries such as finance, IT, engineering, data science, biotechnology, and more, where strong mathematical and computational skills are in demand. • Government Sector: Post Graduates can find employment opportunities in government agencies, research laboratories, and public institutions, working on projects related to defense, healthcare, environmental science, and policy analysis. • Consulting: Post Graduates can work as consultants, providing expertise in mathematical modelling, data analysis, and optimization to businesses and organizations across different sectors. • Entrepreneurship: Post Graduates can start their ventures or join startups that leverage mathematical and computational techniques to develop innovative products, solutions, and services.
3	**Programme Outcome**	After successful completion of this programme, students will be able to • Demonstrate a profound understanding of advanced mathematical concepts, including calculus, algebra, differential equations, discrete mathematics, and numerical analysis. • Proficiently use various computer applications and programming languages to solve mathematical problems, analyze data, and implement

algorithms.

- Possess strong analytical and problem-solving skills, capable of tackling complex real-world problems by applying mathematical and computational techniques.
- Equip with the necessary research skills to conduct independent research, publish papers, and contribute to the advancement of mathematical and computational sciences.
- Apply mathematical techniques and computational methods to interdisciplinary fields, fostering innovation and collaboration across different domains.

4 **Course Outcomes**

SN	Course Code & Name	Course Outcomes
	Semester 1	
1	MAT501: Real Analysis	After successful completion of this course, student should be able to • Comprehend the aspect of Metric Space which forms foundation for topology • Understand thorough foundation of Riemann integration theory • Use convergence of sequence and series of functions to evaluate Riemann integration of functions
2	MAT502:Abstract Algebra	After successful completion of this course, student should be able to • Build foundation of group and ring theory • Apply the concept of subgroup and normal subgroups to discuss the solvability of groups and thereby solvability of equations of any positive order • Generalize the concepts of divisibility to rings and apply them in general context and factorize polynomials.
3	MAT503: Ordinary Differential Equations	After successful completion of this course, student will be able to • Understand various methods of solutions of differential equations of first and second order. • Apply these methods to solve differential equations in physics and engineering fields • Discuss approximation and existence & uniqueness of solution of nth order differential equations to solve them using the techniques discussed thereby.
4	MAT611:	After successful completion of this course, student

				Programming in Python	should be able to • Explain basic principles of Python programming language • Implement object oriented concepts • Demonstrate the use of Python in Mathematics such as operations research and computational Geometry etc. • Study graphics and design and implement a program to solve a real world problem • Implement the concepts of data with python and database connectivity
			5	RES505: Research Methodology	After successful completion of this course, student will be able to • Understand some basic concepts of research and its methodologies. • Select proper method of Data collection & representation • Select and apply appropriate statistical method for data analysis. • Perform literature review, research writings with the knowledge of Intellectual Property Rights.
			6	MAT506: Operations Research	After successful completion of this course, student should be able to • Understand the theory of convex sets, functions, formulation of LPP, techniques of integer and non-integer solution of Linear and nonlinear programming problems. • Use quantitative methods and techniques for effective decisions– making • Develop model formulation and applications that are used in solving business decision problems.
			7	MAT515: Number Theory	After successful completion of this course, student should be able to • Understand the concept of arithmetical functions • Solve problems based on congruences and quadratic residues • Know the concepts of primitive root theory
			8	MAT508: Introduction to Probability and Statistics	After successful completion of this course, student should be able to • Understand concept of probability, random variable and probability distribution

				• Apply various discrete probability distributions • Apply various continuous probability distributions • Understand and apply testing of hypotheses, Non-parametric statistical Inferences
		Semester 2		
		9	MAT509: Topology	After successful completion of this course, student should be able to • Understand the basic concepts of topology and base for the topology • Discuss continuity of functions in topological spaces • Apply countability axioms for discussion of compactness, connectedness and sequential continuity of functions.
		10	MAT510: Linear Algebra	After successful completion of this course, student should be able to • Develop concepts of vector spaces and modules • Solve problems based on Linear transformations and Characteristic roots • Construct matrices in Nilpotent, Jordan and Rational forms which are useful for solving system of equations • Visualize theadjoint, self-adjoint and normal linear trans formations
		11	MAT511: Partial Differential Equations	After successful completion of this course, student should be able to • Solve the first-order linear and non-linear partial differential equations by using Lagrange's and Charpit'smethods respectively. • Understand concepts, methods of Solutions and applications of Partial Differential equations.
		12	MAT512:LaTex and Programming in SageMath	After successful completion of this course, student should be able to • Write a simple LaTeX input document based on the article class • Turn the input document into pdf with the pdflatex program • Format Words, Lines, and Paragraphs • Understand how to present data using

				tables • Typeset mathematical formulas, use nested list, tabular and array environments. • Import figures and pictures that are stored in external files.
		13	MAT513: OJT	After successful completion of this course, student should be able to – • Demonstrate proficiency in applying theoretical knowledge and academic concepts to real-world professional situations. • Possess job-specific skills that are relevant to their chosen field of study, enabling them to perform tasks and responsibilities effectively and efficiently. • Acquire a comprehensive understanding of industry practices, trends, and challenges, contributing to their overall knowledge and expertise in the field. • Establish professional networks and relationships, expanding their professional connections and opportunities for future collaborations and career advancement. • Develop problem-solving and critical thinking abilities, demonstrating the ability to analyze complex situations, make informed decisions, and propose effective solutions. • Demonstrate professionalism, adaptability, and effective communication skills in a professional work environment.
		14	MAT514:FP	After successful completion of this course, student should be able to – • Demonstrate the ability to apply theoretical knowledge and concepts to real-world situations, effectively bridging the gap between academia and practical applications. • Develop advanced research and investigative skills, including the ability to design and execute research projects, collect and analyze data, and draw well-founded conclusions. • Conduct independent research, demonstrating the ability to formulate

				research questions, design appropriate methodologies, and independently execute fieldwork or data collection. • Exhibit effective collaboration and communication skills, demonstrating the ability to work collaboratively with others, engage in professional dialogue, and effectively communicate their research findings to diverse audiences. • Showcase advanced problem-solving and critical thinking abilities, demonstrating the capacity to identify and address challenges encountered during fieldwork, analyze complex data, and propose innovative solutions. • Demonstrate a thorough understanding of ethical considerations, field safety protocols, and best practices in their chosen field of study.
		15	MAT507: Numerical Analysis	After successful completion of this course, student should be able to • Find solutions of algebraic or transcendental equations using an appropriate numerical method • Solve linear systems of equations using an appropriate numerical method Apply the techniques of numerical methods to solve ordinary differential equations.
		16	MAT518: Field and Coding Theory	After successful completion of this course, student should be able to • Understand the algebraic structure of Finite Field extension using irreducible polynomials • Understand that how coding theory techniques are applied for error-detection and correction in communication channels • Understand that error-detecting and correcting capacities are dependent on code structure
		17	MAT519: Statistical Inference	After successful completion of this course, student should be able to • Explain the concepts of MVUE, Sufficiency, and Minimal sufficiency, Efficiency of an estimator. • Find CRLB of an unbiased estimator and

				MVUE using Rao-Blackwell Theorem • Identify when non-parametric methods are appropriate, apply suitable tests, and draw conclusions based on non-parametric inference. • Find Bayes Estimates under different loss functions. • Understand the concepts of MP, UMP, UMPU, and MLR Tests and construct such tests in a parametric setup.
			Semester 3	
		18	MAT601:Complex Analysis	After successful completion of this course, student should be able to • Understand the concepts of analytic functions, harmonic functions and the importance of the Cauchy Riemann equations. • Apply analyticity solve integration of functions • Describe the basic properties of singularities, zeros residues, poles to solve integrals. • Apply concept of Hadamard Theorem and Uniqueness of Direct Analytic Continuation along a Curve, Power Series Method of Analytic Continuation
		1 9	MAT616: Machine Learning	After successful completion of this course, student should be able to • Define and explain key machine learning concepts, including supervised, unsupervised, and reinforcement learning. • Understand the machine learning workflow: data collection, preprocessing, model training, evaluation, and deployment. • Apply machine learning techniques to real-world datasets in various domains. • Analyze and interpret model results to derive meaningful insights. • Present findings and solutions using clear visualizations and explanations.
		20	MAT617: Introduction to Artificial Intelligence	After successful completion of this course, student should be able to • Identify problems that are amenable to solution by AI methods. • Identify appropriate AI methods to solve a

					given problem. • Design smart systems using different informed search / uninformed search or heuristic approaches. • Apply the suitable algorithms to solve AI problems.
			21	MAT618: Practical on AI and ML	After successful completion of this course, student should be able to • Use proficiently popular ML libraries and tools for data analysis, model building, and evaluation. • Implement a variety of machine learning algorithms, including supervised learning, unsupervised learning, and deep learning techniques. • Capable of preprocessing and cleaning datasets to prepare them for training ML models.
			22	MAT605: Research Project - I	After successful completion of this course, student should be able to • Frame research problem & do literature survey about the same • Do independent thinking • Learn basic techniques for carrying out research
			23	MAT619: Design and Analysis of Algorithm	• After successful completion of this course, student should be able to • Design efficient algorithms using various algorithmic techniques. • Apply appropriate design strategies to solve specific computational problems. • Enhanced problem-solving skills with the ability to approach new problems methodically. • Think critically and develop innovative solutions. • Understand theoretical concepts such as NP-completeness, P vs NP, and approximation algorithms. • Familiar with advanced topics like randomized algorithms and amortized analysis.

		24	MAT620: Foundation of Quantum Computing	After successful completion of this course, student should be able to • Understand the basic mathematical technique used in quantum computing • Understand the basic of quantum mechanics and fundamental of quantum computing • Understand the different types of quantum gates, quantum circuits and different physical realizations of qubits
		25	MAT621: Time Series Analysis	After successful completion of this course, student should be able to • Understand the fundamental concepts in time series analysis • Carry out an exploratory analysis of time series • Understand the concepts of stationarity of a time series and solve related problems • Apply forecasting techniques • Conduct multivariate time series models
		Semester 4		
		26	MAT606: Discrete Mathematics	After successful completion of this course, student should be able to • Solve problems on permutation and combinations, discrete Probability • Understand concepts of graph theory, Trees, Cut-sets • Understand properties of Boolean algebra, lattice and Boolean functions, Algebraic Systems defined by Lattices
		27	MAT622: Introduction to Data Science	After successful completion of this course, student should be able to • Understand the principles and techniques used in data science • Analyze and interpret data to make informed decisions and gain valuable insights. • Apply various data science concepts, tools, and methodologies to solve real-world problems
		28	MAT623: SQL for Data Science	After successful completion of this course, student should be able to • Comprehensively understanding of SQL (Structured Query Language) and its applications in the field of Data Science.

					• Understand fundamental concepts of SQL, its syntax, and how to use it for data manipulation, querying, and analysis. • Apply various aspects of SQL, including database design, data retrieval, aggregation, and visualization, enabling students to effectively work with large datasets and extract valuable insights for data-driven decision-making.
			29	MAT612: Research Project	After successful completion of this course, student should be able to • Frame research problem & do literature survey about the same • Do independent thinking • Learn basic techniques for carrying out research
			30	MAT613: Cryptography	After successful completion of this course, student should be able to • Use various primarily tests, encryption and decryption algorithms • Apply arithmetic of elliptic curves in cryptography • Use ways of doing secret communication
			31	MAT624: Quantum Computing Algorithm	After successful completion of this course, student should be able to • Understand the basic technique used in quantum computing algorithms • Understand the working principle of quantum gates and quantum circuits • Understand the different quantum computing algorithms • Understand the quantum errors and quantum error correction
			32	MAT625: Theory of Computations	After successful completion of this course, student should be able to • Understand the algebraic structure of finite state machines and automata and languages. • Understand how Automata theory techniques are applied for construction of machines, software, designing computer compiler etc. • Understand that regular and context free languages are equivalent with finite automata and Pushdown automata respectively.

Appendix II

Evaluation Pattern

SN	Type of Course	Continuous Assessment (CA)	End Examination (EE)
1	Theory (T) 4 Credit 100 Marks CA: 30% EE: 70%	Each student is required to attempt total 02 (Two) "Continuous Assessments (CAs)" for each course of each Semester, as per the following details: 1. CA01: 'Continuous Assessment 01 (CA01)' on Credit 01 to Credit 04 of each course, consists of • 2 (Two) 'Short Answer Questions (SAQs)',each carrying 05 Marks, on Credit 01 and Credit 02 **and** • 1 (One) 'Long Answer Question (LAQ)' of 10 Marks, on Credit 03 and Credit 04. LAQ may consist of sub-questions. **CA01**: On Credit 01 to Credit 04, of Marks = (5x2 + 10) = **20 Marks** 2. CA02: 'Continuous Assessment 02 (CA02)' on Credit 01 to Credit 04 of each course, consists of • A test containing total **10** (Ten) 'Objective Type Questions, ' 05 (Five) on Credit 01 and Credit 02,and 05 (Five) on Credit 03 and Credit 04. Each 'Objective Type Question' of 1 Mark. **CA02**: On Credit 01 to Credit 04, of Marks = **10 Marks** 3. Maximum number of attempts for **CA,** during each semester : Single attempt only 4. **Total Marks**: **30** Marks	1. Student is required to answer **05 'VSAQs' out of 06 'VSAQs'**, each carrying 03 Marks, on Credit 01 to 04, for total 15 Marks. One VSAQ will be on each Credit. 2. Student is required to answer **05 'SAQs' out of 06 'SAQs'**, each carrying 05 Marks, on Credit 01 to 04, for total 25 Marks. One SAQ will be on each Credit. 3. Student is required to answer **01 'LAQ' out of 2 LAQs,** of 10 Marks on Credit 01 and Credit 02, for total 10 Marks. LAQ may consist of sub-questions. 4. Student is required to answer **01 'LAQ' out of 2 LAQs,** of 10 Marks on Credit 03 and Credit 04, for total 10 Marks. LAQ may consist of sub-questions. 5. Student is required to answer **01 'LAQ' out of 2 LAQs,** of 10 Marks on Credit 01 to Credit 04, for total 10 Marks. LAQ may consist of sub-questions. 6. Number of attempts: Till Valid Registration Period (VRP) only 7. Marks: 70 Marks 8. Duration: 150 minutes

<table>
<tr><th>SN</th><th>Type of Course</th><th colspan="2">Continuous Assessment (CA)</th><th colspan="2">End Examination (EE)</th></tr>
<tr><td></td><td></td><td colspan="4"><table>
<tr><th>SN</th><th>Description</th><th>Evaluation of End Examination(EE)</th><th>Marks</th></tr>
<tr><td rowspan="3">1</td><td rowspan="3">Question Types</td><td>Very Short Answer Question (VSAQ) on each Credit</td><td>03 Marks</td></tr>
<tr><td>Short Answer Question (SAQ) on each Credit</td><td>05 Marks</td></tr>
<tr><td>On each Credit, either Single Long Answer Question (LAQ) or LAQ contains sub-questions (a), (b) and so on.</td><td>10 Marks</td></tr>
<tr><td>2</td><td>Grand Total Marks</td><td>Total five Questions in EE Question paper based on:
Credit 01 to 04 : 05 VSAQs out of 06 VSAQs (15 Marks)
Credit 01 to 04 : 05 SAQs out of 06 SAQs (25 Marks)
Credit 01 to 02 : 01 LAQ out of 02 LAQs (10 Marks)
Credit 03 to 04 : 01 LAQ out of 02 LAQs (10 Marks)
Credit 01 to 04 : 01 LAQ out of 02 LAQs (10 Marks)
LAQ may contains sub-questions</td><td>70 Marks</td></tr>
</table></td></tr>
<tr><td>2</td><td>Theory (T)
2 Credit
50 Marks

CA: 30%
EE: 70%</td><td colspan="2">Each student is required to attempt total 01 (One) “Continuous Assessment (CA)” for each course of each Semester, as per the following details:
1. CA01: 1 (One) ‘Continuous Assessment 01 (CA01)’ on Credit 01 and Credit 02 of each course, consists of
• 1 (One) ‘Short Answer Question (SAQ)’ of 5 Marks
and
• 1 (One) ‘Long Answer Question (LAQ)’of 10 Marks, LAQ may consist of sub-questions.
CA01: On Credit 01 and Credit 02, of Marks = (5 + 10) = 15 Marks
2. Maximum number of attempts for CA, during each semester: Single attempt only
3. Total Marks: 15 Marks</td><td colspan="2">1. Student is required to answer 05 ‘VSAQs’ out of 06 ‘VSAQs’, each carrying 03 Marks, on Credit 01 to 02, for total 15 Marks. One VSAQ will be on each Credit.
2. Student is required to answer 02 ‘SAQs’ out of 03 ‘SAQs’, each carrying 05 Marks, on Credit 01 to 02, for total 10 Marks. One SAQ will be on each Credit.
3. Student is required to answer 01 ‘LAQ’ out of 2 LAQs, of 10 Marks on Credit 01 and Credit 02, for total 10 Marks. LAQ may consist of sub-questions.
4. Number of attempts: Till Valid Registration Period (VRP) only
5. Marks: 35 Marks
6. Duration: 75 minutes</td></tr>
</table>

<table>
<tr><th>SN</th><th>Type of Course</th><th colspan="2">Continuous Assessment (CA)</th><th colspan="2">End Examination (EE)</th></tr>
<tr><td></td><td></td><td colspan="4">
<table>
<tr><th>SN</th><th>Description</th><th>Evaluation of End Examination (EE)</th><th>Marks</th></tr>
<tr><td rowspan="3">1</td><td rowspan="3">Question Types</td><td>Very Short Answer Question (VSAQ) on each Credit</td><td>03 Marks</td></tr>
<tr><td>Short Answer Question (SAQ) on each Credit</td><td>05 Marks</td></tr>
<tr><td>On each Credit, either Single Long Answer Question (LAQ) or LAQ contains sub-questions (a), (b) and so on.</td><td>10 Marks</td></tr>
<tr><td>2</td><td>Grand Total Marks</td><td>Total three Questions in EE Question paper based on:
Credit 01 to 02 : 05 VSAQs out of 06 VSAQs (15 Marks)
Credit 01 to 02 : 02 SAQs out of 03 SAQs (10 Marks)
Credit 01 to 02 : 01 LAQ out of 02 LAQs (10 Marks)
LAQ may contains sub-questions</td><td>35 Marks</td></tr>
</table>
</td></tr>
<tr><td>3</td><td>Practical (P)

4 Credit
100 Marks

CA: 50%
EE: 50%</td><td colspan="2">1. Student is required to submit “Activity Report in Work-Book Format” for each Credit in the prescribed format.
2. Maximum number of attempts for each CA, during each semester : Single attempt only
3. Marks: 50 Marks
4. Grading criteria:
<table>
<tr><td>Lab Punctuality, Preparedness & Ethics</td><td>Irregular in lab. Copies the experiment from others
(0 Points)</td><td>Consistently regular but unable to explain the concepts
(06 Points)</td><td>Punctuality in lab. Follows the procedure and responds to questions asked
(10 Points)</td></tr>
<tr><td>Activity Report and Performance

(Experiment No, Date, Objectives, Apparatus with specification, Observations, Graphs, software used if any)</td><td>Poor Documentation and copied the experiment from others.
Couldn't perform the Activity /poor observation made
(04 Points)</td><td>Average Documentation: Report is in format but some of the formatting guidelines are missed. Performed the Activity but observations made with some mistakes
(12 Points)</td><td>Good Documentation: Lab activity writing is in proper format with all references, Grammar.
Performed the Activity on time observations made with no mistakes
(20 Points)</td></tr>
<tr><td>Results and Conclusion</td><td>Unable to achieve the desired results but makes attempts to relate data to theory. Poor concluding statements
(08 Points)</td><td>Average graphical and tabulated representation with misinterpret physical significance of theory. Achieve the desired results and but insufficient conclusion statement.
(14 Points)</td><td>Analyses and interpret observed data carefully with good graphical and tabulated representation using appropriate theory/evidence. Achieve the results and reach to appropriate Conclusion
(20 Points)</td></tr>
</table></td><td colspan="2">External and internal examiners shall assess each student based on:
1. Workbook/Activity Report submission by the student (Only by External Examiner) [05 Marks]
2. Practical Activity performed by the student [12 Marks]
3. Result and Conclusion of the Practical Activity [13 Marks]
4. Viva-Voce on Practical Activities [20 Marks]
5. Number of attempts: Till Valid Registration Period (VRP) only
6. Marks: 50 Marks
7. Duration: 180 minutes</td></tr>
</table>

<table>
<tr><th>SN</th><th>Type of Course</th><th>Continuous Assessment (CA)</th><th>End Examination (EE)</th></tr>
<tr><td></td><td></td><td>
<table>
<tr><td rowspan="2">SN</td><td colspan="3">Evaluation of Practical End Examination</td></tr>
<tr><td>Description</td><td>Internal Examiner</td><td>External Examiner</td></tr>
<tr><td>1</td><td>Workbook/Activity Report</td><td>-</td><td>05 Marks</td></tr>
<tr><td>2</td><td>Actual Conduct of one randomly selected Practical Activity</td><td>02 Marks</td><td>10 Marks</td></tr>
<tr><td>3</td><td>Diagram, Synoptic Answers, Graph/Observation and Conclusion</td><td>03 Marks</td><td>10 Marks</td></tr>
<tr><td>4</td><td>Viva-Voce/Oral</td><td>05 Marks</td><td>15 Marks</td></tr>
<tr><td>5</td><td>Total</td><td>10 Marks</td><td>40 Marks</td></tr>
</table>
</td><td></td></tr>
<tr><td>4</td><td>Field Project (TW)

4 Credit
100 Marks

CA: 50%
EE: 50%</td><td>Students need to complete one month Field Project (Total Study hours 120 hrs including Activity Report). After completion of the field project, learners shall submit a report to the LSC - Programme Coordinator (PC) and Mentor/Guide.
1. Maximum number of attempts for each CA, during each semester: Single attempt only
2. Duration: 1 Month or 4 Weeks duration –i) After end examination of semester 02 and before beginning of semester 03 or
ii) Any one month during semester 02 duration
3. Marks: 50 Marks
4. Grading Criteria for Evaluation of FP (only by Mentor/Guide):
<table>
<tr><td>SN</td><td>Description</td><td>Marks</td></tr>
<tr><td>1</td><td>Key Definitions of Problem area and analysis of preliminary data</td><td>15</td></tr>
<tr><td>2</td><td>Work related to formats, Correspondence, Interactions and liaising etc</td><td>05</td></tr>
<tr><td>3</td><td>Field work and data collection</td><td>15</td></tr>
<tr><td>4</td><td>Analysis and Report</td><td>10</td></tr>
<tr><td>5</td><td>Feedback to community</td><td>05</td></tr>
<tr><td colspan="2">Total</td><td>50</td></tr>
</table>
</td><td>1. External and Internal examiners (Internal examiner - Programme Coordinator (PC) / Supervisor of LSC) shall assess each student based on:
a. Activity Report submission by the student (Only by External Examiner) [10 Marks]
b. Viva-Voce on Activity Report [40 Marks]
2. Number of attempts: Till Valid Registration Period (VRP) only
3. Marks: 50 Marks
4. Duration: 180 minutes</td></tr>
</table>

<table>
<tr><th>SN</th><th>Type of Course</th><th colspan="3">Continuous Assessment (CA)</th><th colspan="3">End Examination (EE)</th></tr>
<tr><td></td><td></td><td></td><td colspan="5"><table>
<tr><td rowspan="2">SN</td><td colspan="3">Evaluation of Field Project End Examination</td></tr>
<tr><td>Description</td><td>Internal Examiner
(Programme Coordinator
(PC)/ Supervisor of LSC)</td><td>External Examiner</td></tr>
<tr><td>1</td><td>Workbook/Report submission</td><td>-</td><td>10 Marks</td></tr>
<tr><td>2</td><td>Viva-Voce /Oral</td><td>10 Marks</td><td>30 Marks</td></tr>
<tr><td>3</td><td>Total</td><td>10 Marks</td><td>40 Marks</td></tr>
</table></td></tr>
</table>

<table>
<tr><th>SN</th><th>Type of Course</th><th>Continuous Assessment (CA)</th><th>End Examination (EE)</th></tr>
<tr><td>5</td><td>OJT or Internship (TW)

4 Credit
100 Marks

CA: 50%
EE: 50%</td><td>
1. Students need to complete one month On Job Training (OJT) or Internship (Total Study hours 120 hrs including Internship Report) in any Industry/Organization/Institute/ R&D Division /Any Micro/Small/Medium/ enterprise/Govt/NGO/PSU/Online Internship related to major course.
2. Maximum number of attempts for each CA, during each semester: Single attempt only
3. Marks: 50 Marks
4. Duration: 1 Month or 4 Weeks –
i) After end examination of semester 02 and before beginning of semester 03.
or
ii) Any one month during semester 02 duration
5. Grading Criteria for Evaluation of OJT (or Intern) only by Mentor where the Internship is proposed to be imparted:
<table>
<tr><th>SN</th><th>Parameters</th><th>Marks Out of</th></tr>
<tr><td>1</td><td>Behaviors, Shows interest in assigned work, Willingness to learn</td><td>10</td></tr>
<tr><td>2</td><td>Accepts responsibility, Cooperates with co-workers and supervisors, Demonstrates organizational skills</td><td>10</td></tr>
<tr><td>3</td><td>Uses time, knowledge and expertise effectively, Analyzes problems effectively</td><td>10</td></tr>
<tr><td>4</td><td>Demonstrates creativity/ originality / any innovative contribution, Professional ethics and accountability</td><td>10</td></tr>
<tr><td>5</td><td>Writes effectively, Produces high quality work/Skill Proficiency</td><td>10</td></tr>
<tr><td colspan="2">Total</td><td>50</td></tr>
</table>
Document as Evidence: Activity report along with Certificate or Declaration, duly issued and signed by the concerned authority [To be assessed during EE] should be submitted during End Examination to the parent Learner support Centre (LSC).
</td><td>
At the end of second semester, Programme Coordinator (PC)/ Supervisor of LSC and 1 (one) External Examiner will complete ‘End Exam (EE)’ for all allotted students as follows:
1. Duration of EE: After Theory EE of second Semester
2. Programme Coordinator (PC)/ Supervisor of LSC and External Expert will have 20% and 80% weightage respectively in EE.
3. Number of attempts: Till Valid Registration Period (VRP) only
4. Marks for EE: 50 Marks
<table>
<tr><th>Parameter</th><th>PC /Supervisor of LSC</th><th>External Expert</th></tr>
<tr><td>Professional Attitude</td><td>-</td><td>05 Marks</td></tr>
<tr><td>Maintenance of Daily Diary</td><td>-</td><td>10 Marks</td></tr>
<tr><td>Internship Report</td><td>05 Marks</td><td>10 Marks</td></tr>
<tr><td>Viva/Oral</td><td>05 Marks</td><td>15 Marks</td></tr>
<tr><td>Total</td><td>10 Marks</td><td>40 Marks</td></tr>
</table>
</td></tr>
</table>

<table>
<tr><th>SN</th><th>Type of Course</th><th>Continuous Assessment (CA)</th><th>End Examination (EE)</th></tr>
<tr><td>6</td><td>Project Work (PW)

RP-I
4 Credit
100 Marks

CA: 50%
EE: 50%</td><td>1. Student is required to submit “Activity Report” based on Grading Criteria of the course in the prescribed format.
2. Maximum number of attempts for each CA, during each semester: Single attempt only
3. Marks: 50Marks
4. Grading Criteria:
<table>
<tr><td>SN</td><td>Desc</td><td>Marks</td></tr>
<tr><td>1</td><td>Seminar*</td><td>25</td></tr>
<tr><td>2</td><td>Research Proposal</td><td>25</td></tr>
</table>
*To be conducted in Online/Offline mode at LSC.</td><td>1. External and internal examiners shall assess each student based on:
a. Project Report submission by the student (Only by External Examiner) [10 Marks]
b. Project Presentation by the student [20 Marks]
c. Viva-Voce on Project Report [20 Marks]
2. Number of attempts: Till Valid Registration Period (VRP) only
3. Marks: 50 Marks
4. Duration: 180 minutes</td></tr>
<tr><td></td><td></td><td colspan="2">
<table>
<tr><td rowspan="2">SN</td><td colspan="3">Evaluation of Project Work End Examination</td></tr>
<tr><td>Description</td><td>Internal Examiner</td><td>External Examiner</td></tr>
<tr><td>1</td><td>Project Report</td><td>-</td><td>10 Marks</td></tr>
<tr><td>2</td><td>Project Presentation</td><td>05 Marks</td><td>15 Marks</td></tr>
<tr><td>3</td><td>Viva-Voce /Oral</td><td>05 Marks</td><td>15 Marks</td></tr>
<tr><td>4</td><td>Total</td><td>10 Marks</td><td>40 Marks</td></tr>
</table>
</td></tr>
<tr><td>7</td><td>Project Work (PW)

RP-II

6 Credit
150 Marks

CA: 50%
EE: 50%</td><td>1. Student is required to submit “Activity Report” based on Grading Criteria of the course in the prescribed format.
2. Maximum number of attempts for each CA, during each semester: Single attempt only
3. Marks: 75 Marks
4. Grading Criteria:
<table>
<tr><td>SN</td><td>Desc</td><td>Marks</td></tr>
<tr><td>1</td><td>Seminar*</td><td>30</td></tr>
<tr><td>2</td><td>Research Paper Presentation**</td><td>30</td></tr>
<tr><td>3</td><td>Project Report</td><td>15</td></tr>
</table>
*To be conducted in Online/Off line mode at LSC.
** Journals/Conferences/ at LSC, in Online/Offline mode [This activity shall be organized by respective LSC in Online/Offline mode in case student didn’t get an opportunity for presentation at Journals/Conferences]</td><td>1. External and internal examiners shall assess each student based on:
a. Project Report submission by the student (Only by External Examiner) [20 Marks]
b. Project Presentation by the student [25 Marks]
c. Viva-Voce on Project Report [30 Marks]
2. Number of attempts: Till Valid Registration Period (VRP) only
3. Marks: 75 Marks
4. Duration: 180 minutes</td></tr>
</table>

<table>
<tr><th>SN</th><th>Type of Course</th><th colspan="2">Continuous Assessment (CA)</th><th colspan="2">End Examination (EE)</th></tr>
<tr><td></td><td></td><td colspan="4"><table>
<tr><td rowspan="2">SN</td><td colspan="3">Evaluation of Project Work End Examination</td></tr>
<tr><td>Description</td><td>Internal Examiner</td><td>External Examiner</td></tr>
<tr><td>1</td><td>Project Report</td><td>-</td><td>20 Marks</td></tr>
<tr><td>2</td><td>Project Presentation</td><td>05 Marks</td><td>20 Marks</td></tr>
<tr><td>3</td><td>Viva-Voce /Oral</td><td>10 Marks</td><td>20 Marks</td></tr>
<tr><td></td><td>Total</td><td>15 Marks</td><td>60 Marks</td></tr>
</table></td></tr>
</table>

End Of Doc

DEB-UGC application for Programme approval for AY 2024-25

School of Sciences, YCMOU, Nashik

(Formerly School of Architecture, Science and Technology)

Programme Project Report (PPR)

M.Sc. (Zoology)

A. Programme Project Report (PPR)

Name of Program :		
a	Programme's mission & objectives	**Mission**: The 'M.Sc. (Zoology)' Program aims to create awareness about Zoology, analyze various vital Zoological issues and find creative solutions for the same, to inculcate values, entrepreneurship and research attitude in learners. **Objectives**: The 'M.Sc. (Zoology)' Program will- a) Inculcate critical thinking and analytical skills to enable students to pursue higher studies and research in Life Sciences or related allied fields of Zoology. b) Provide a strong foundation for a better understanding of current advances in Zoology and its practical significance. c) Expose students to current trends in research about Zoology. d) Provide job opportunities in allied sectors [Pharma Industries, Indian Forest Services, Food Industries, Zoological Park, National Biological Laboratories, and Scientist, academic career in institutions as lecturers and professors or a scientific career in various scientific positions. They can also go and work as Researchers and as administrators etc.]
b	Relevance of the program with HEI's Mission and Goals	Objects of the YCMOU (as per the YCMOU Act) which would be fulfilled by implementing the proposed program (a) To provide through instruction, teaching and training and other educational opportunities, access to larger and larger segment of population, and in particular to the disadvantaged groups such as those living in remote and rural areas including working people, housewives and other adults who wish to upgrade or acquire knowledge through studies in various fields; [1(a)] (b) To strengthen and diversify the degrees, diploma and certificate courses at various educational levels, to fulfill the knowledge, skills and development needs of the individuals, institutions and society in general, by relating, particularly, the courses, to the needs of the employment and economic development of the state on the basis of its natural and human resources; [1(b)] (c) To promote acquisition of knowledge in a rapidly developing and changing society and to continually offer opportunity of upgrading knowledge, training and skills in the context of innovations, research and discovery in all field of human Endeavour by developing educational network with the use of modern communication media and technologies appropriate for a learning society; [1(c)] (d) To provide an innovative system of University level education, flexible and open, in regard to the methods and

<table>
<tr><td></td><td></td><td>pace of learning, combination of courses, eligibility for enrolment, age of entry, conduct of examinations and operation of the program, with a review to promote learning and encourage excellence in all fields of knowledge; [1(d)]
(e) To contribute to the improvement of the education system in the state by providing a non-formal channel complementary to the formal system and encouraging transfer of credits and exchange of teaching staff by making a wide use of text and other software developed by the University; [1(e)]
(f) To develop innovative, need based Vocational courses and establish industry, institution linkage for developing the society; [1(f)]
(g) To provide through incidental and non-formal means, for continuing and extension of education in various cultural forms, arts, crafts and skills of the country, raising their quality and improving their availability to the people; [1(g)]
(h) To provide for the counseling and guidance to its students; [1(j)]
(i) To provide major part of its resources and direct efforts in designing, developing and offering need-based and relevant vocational courses. [1(l)]</td></tr>
<tr><td>c</td><td>Nature of prospective target group of learners</td><td>Candidates with B.Sc. with Zoology at FY and SY/ B.Sc. (Agri) Degree or Equivalent pass
Although, similar PG Program on offer from the conventional institutes, conventional educational system offers very little freedom to learners as regards to when, where, how to learn. Proposed Program aims to provide this freedom to learners to the maximum possible extent</td></tr>
<tr><td>d</td><td>Appropriateness of programme to be conducted in Open and Distance Learning mode to acquire specific skills and competence

1. Knowledge Attainment:
2. Skills and Competencies:
3. Compliances of academic, professional & occupational standards</td><td>Proposed Program aims to provide relevant skills as needed by the working professional to identify, and solve challenging problems in Zoology, thus contributing to the ever increasing demands of the society/industry.
The program helps to develop scientific tempers and attitudes, which in turn can prove to be beneficial for the society since the scientific developments can make a nation or society to grow at a rapid pace. After studying this program, students will be more equipped to learn and know about different biological systems, their coordination and control as well as evolution, behavior and biological roles of the animals in the ecosystem.
This program uses the Open and Distance(ODL) Mode of Education- Theory, Practical/ Project component of teaching-learning is offered as face to face counselling by the qualified and experienced teacher at recognized study center along with continuous assessment and offline materials/ resources in printed book format. Hence, this program is appropriate to conduct in Open and Distance Learning mode to acquire specified skills and competence.</td></tr>
<tr><td>e</td><td>Instructional Design
Instructional Design :
1. Curriculum Design (Outcome of Expert Committee meeting; Program Structure: specify the theory,</td><td>Semester pattern: This programme is of total 4 semesters. Distribution of the credits are as follows –

<table>
<tr><th rowspan="2">Sem</th><th colspan="2">Mandatory Courses (DSC)</th><th rowspan="2">Elective Courses (DSE)</th><th rowspan="2">Other Courses
4 CR/ 6 CR</th><th rowspan="2">Total Courses (CR)</th></tr>
<tr><th>Theory</th><th>Practical</th></tr>
</table>
</td></tr>
</table>

***practical, fieldwork, project, etc components*):**

2. Total Credit Points (*including course wise*):

3. Detailed Syllabi:

4. Duration of the program (***Minimum & Maximum*):**

Medium of Instruction:

6. Type of Program (***General/Technical/ Professional*):**

7. Faculty and Support Staff:

8. Instructional Design & Delivery Mechanism (***Media to be used -print, audio, video, online, computer aided, web based, etc. (course wise)*):**

Student Support Service System (***Specify the provisions to be made at Head Quarter, Regional Centers, Learner Support Centers and Web based, etc*):**

	4 CR	2 CR	4 CR	(4 CR)		
1	2	1	1	1	1 – Research Methodology (4 CR)	**6** (22 CR)
2	2	1	1	1	Any one - OJT/ Field Projects (4 CR)	**6** (22 CR)
3	2	1	1	1	1- Research Project (4 CR)	**6** (22 CR)
4	2	-	1	1	1- Research Project (6 CR)	**5** (22 CR)
Total	8 x 4 = 32 (38 CR)	3 x 2 = 06	4 x 4 = (16 CR)	4 x 4 = (16 CR)	3 x 4 + 1 x 6 = (18 CR)	**23** (88 CR)

Programme Structure:

SN	Course Category	Code	Course Name	CA	EE	TM	Type	CR	Min %
[Level 6.0] Semester 01: 22 Credits									
01	Mandatory (DSC)	ZOO501	Biochemistry	30	70	100	T	4	40%
02	Mandatory (DSC)	ZOO502	Cell Biology	30	70	100	T	4	40%
03	Mandatory (DSC)	ZOO503	Applied Zoology Part-I	15	35	50	T	2	40%
04	Mandatory (DSC)	ZOO504	Lab on Biochemistry, Cell Biology & Applied Zoology Part-I	50	50	100	P	4	40%
05	RM	RES505	Research Methodology	30	70	100	T	4	40%
Elective (DSE) Courses (Select Any One)									
06	Elective (DSE)	ZOO506	Developmental Biology	30	70	100	T	4	40%
07	Elective (DSE)	ZOO507	Entomology	30	70	100	T	4	40%
[Level 6.0] Semester 02 : 22 Credits									
09	Mandatory (DSC)	ZOO509	Molecular Biology	30	70	100	T	4	40%
10	Mandatory (DSC)	ZOO510	Genetics	30	70	100	T	4	40%
11	Mandatory (DSC)	ZOO511	Applied Zoology Part-II	15	35	50	T	2	40%
12	Mandatory (DSC)	ZOO512	Lab on Molecular Biology, Genetics & Applied Zoology Part-II	50	50	100	P	4	40%
13	OJT/FP	ZOO513 ZOO514	Any one OJT or FP OJT FP	30	70	100	TW	4	40%
Elective (DSE)Courses (Select Any One)									
14	Elective (DSE)	ZOO515	Animal Biotechnology	30	70	100	T	4	40%
15	Elective (DSE)	ZOO516	Toxicology	30	70	100	T	4	40%
Exit option: PG Diploma {PGD 13 -ZOO (44 Credits)} after Three Year UG Degree									
[Level 6.5] Semester 03 : 22 Credits									
17	Mandatory (DSC)	ZOO601	Immunology	30	70	100	T	4	40%
18	Mandatory (DSC)	ZOO602	Endocrinology	30	70	100	T	4	40%
19	Mandatory (DSC)	ZOO603	Biodiversity & Conservation	15	35	50	T	2	40%
20	Mandatory (DSC)	ZOO604	Lab on Immunology, Endocrinology and Biodiversity &	50	50	100	P	4	40%

			Conservation						
21	RP	ZOO605	Research Project	50	50	100	PW	4	40%
Elective (DSE)Courses (Select Any One)									
22	Elective (DSE)	ZOO606	Reproductive Physiology	30	70	100	T	4	40%
23	Elective (DSE)	ZOO607	Vermiculture	30	70	100	T	4	40%
24	Elective (DSE)	ZOO608	Animal Behavior	30	70	100	T	4	40%
[Level 6.5] Semester 04 : 22 Credits									
25	Mandatory (DSC)	ZOO609	Animal Physiology	30	70	100	T	4	40%
26	Mandatory (DSC)	ZOO610	Ichthyology	30	70	100	T	4	40%
27	Mandatory (DSC)	ZOO611	Lab on Animal physiology & Ichthyology	30	70	100	p	4	40%
28	RP	ZOO612	Research Project	75	75	150	PW	6	40%
Elective (DSE)Courses (Select Any One)									
29	Elective (DSE)	ZOO613	Comparative Animal Physiology	30	70	100	T	4	40%
30	Elective (DSE)	ZOO614	Aquaculture	30	70	100	T	4	40%
31	Elective (DSE)	ZOO615	Parasitology	30	70	100	T	4	40%

Total Credits: 88 and Total Courses: 29 (with electives)
Detailed Syllabi: Available at https://drive.google.com/drive/folders/13lNyj1PT7qN-AAAi2eE8fwDAsCQFWMQz?tid=0B451Yjwt_acQR1VPSUQ4Qotvams

- Programme Outcomes and Course Outcomes: Refer Appendix - I

Minimum programme Duration: 2 years
Maximum Programme Duration: 4 years
Medium of Instruction: English
Type of Program: General
Faculty and Support Staff:
Dr. Chetana Kamlaskar, Director, School of Sciences, YCMOU
Mr. Sachin Jangam, Academic Coordinator
Mr. Rahul Navale, Academic Coordinator
Mr. Ravindra Bharsat, Academic Coordinator
Dr. Jagruti Chavan, Academic Coordinator

Instructional Design & Delivery Mechanism :

- **Minimum number of face-to-face counseling sessions:** 12 (for 4 Credits)
- (For each theory type of course of 4 credits duration of each counseling session shall be 01 Clock Hour)
- (For each Practical/Project type of course of 4 credits duration of each counseling session shall be 02 Clock Hour).
- **Minimum number of face-to-face counseling sessions:** 6 (for 2 Credits)
- (For each theory type of course of 2 credits duration of each counseling session shall be 01 Clock Hour)
- **Minimum number of face-to-face counseling**

		sessions: 18 (for 6 Credits) • (For each Practical/Project type of course of 6 credits duration of each counseling session shall be 02 Clock Hour). • **Required study efforts**: Total 2640 Hours (including Self-Study) during all 4 semesters. • **Attendance**: Minimum 80 % attendance recommended for all activity type of courses • **eBook**: eBook in SLM format for each course (Free Download from University website) at all semesters 01 to semester 04 **Student Support Service System**: At headquarter: Support from School, SSD, Evaluation Division and Exam Unit-3 At Regional Centers: From all 8 regional centers within MH At Learner Support Centers: Recognized Learner support centers within MH Web Based: http://ycmou.digitaluniversity.ac http://www.ycmou.ac.in
f	Procedure for admissions, curriculum transaction and evaluation Procedure for admissions, curriculum transaction and evaluation 1. Define the Admission Policy **(*including web based tools to be adopted*:** 2. Eligibility Criteria: 3. Fee Structure: 4. Financial Assistance to Learners (if any): 5. Activity planner of all academic activities of the academic session: Policy for Evaluation of learner progress along with methods and tools:	**Admissions Procedure**: A customized "Online Annual Admission system" available at DU portal http://ycmou.digitaluniveristy.ac Online payment facility is made available using a credit card or debit card or internet banking. **Admission Eligibility**: B.Sc. with Zoology at FY and SY/ B.Sc. (Agri) Degree or Equivalent pass **Total Programme Fee**: Total ₹ 46,316 for all 04 Semesters, which is duly approved by the university authorities **Curriculum Transaction**: • 01 SLM e-Book will be developed for each theory course • Total 12 Face-To-Face counseling sessions, each of 60 Minutes duration, will be provided at respective learner support center, for each theory course. • Total 12 Face-To-Face counseling sessions, each of 120 Minutes duration, will be provided at respective learner support center, for each practical course. • Curriculum updation will be after every 3 years **Activity planner:**

		Teaching-Learning of students admitted in a single academic year shall start from 01-Sep. every year. (For all Programmes) **Policy**: Refer Evaluation pattern given in Appendix II. **For exit option:** PGD 13-ZOO: Min 40% or better marks in total 12 courses without electives & 14 courses with electives (Subjects) of total 44 credits at Semesters 01 to 02.
g	Requirement of the laboratory support and Library Resources 1. Laboratory Support to the learners (*if any*): 2. Provision of Practical book for learners (*if any*): 3. Provision of Virtual Reality Methods for Practical in case of Online learning (*if any*):	Laboratory requirement and Library Resources – Yes. Institutes/Colleges affiliated with conventional university offering M.Sc. (Zoology) will be only recognized as a Learner support center of this university for this programme. So, requirement of laboratory support and library resources will be automatically ensured. **Recommended**: Computer infrastructure with Wi-Fi/broadband connection Zoology related software/tool.
h	Cost Estimate of the Program and the Provisions: Indicate the Budgetary Requirement for: 1. Programme Development 2. Program Delivery 3. Program Maintenance	Budget provision for this development under A.27.P.38: Fees/Royalties/ Honorarium to Writer/Editors/Trans.
i	Quality assurance mechanism and expected programme outcomes 1. Define the Review Mechanism of the	M.Sc. (Zoology) programme is designed to provide scientific as well as professional level competency to learners, and offers advanced theoretical as well as practical knowledge to learners. This programme enables the learner to develop interest in knowing more about the environment and to

SN	Activity Description	Odd semesters like 01, 03, 05 and 07 From 01-Sep Till 31-Jan	Even semesters like 02, 04, 06 and 08 From 01-Feb Till 31-Jul
Admission: offered on Annual basis collectively for 2 semesters in each academic year.			
01	Fresh and Further Yearly Admission	From June Till Aug	NA
Teaching - Learning			
02	Teaching – Learning (16 Weeks) & Backlog Clearing	From 01-Aug Till 21-Nov	From 01-Feb Till 23-May
End Exam (EE) Form Submission (Required only for Repeater Students)			
03	Online EE Form Submission by SCs/ students at University	On or Before 21-Oct	On or Before 23-Apr
Continuous Assessment (CA) Submission			
05	CA Availability	From 01-Sep Till 21-Nov	From 01-Mar Till 23-May
06	CA Submission by Students	From 01-Nov Till 30-Nov	From 01-May Till 31-May
End Examination (EE)			
07	End Exam for Theory Courses	From 25-Nov to 05-Dec	From 25-May to 05-Jun
08	EE for Activity Courses (Pr, TW, PW, STW, SV)	Immediately after the last day of end exam for theory courses, but positively before 15-Dec	Immediately after the last day of end exam for theory courses, but positively before 15-Jun
10	End Exam Result Declaration	On or Before 31-Jan	On or Before 31-Jul
Semester End Vacation			
11	Semester End Vacation	Jan	July

	Program for enhancing the standards of curriculum, instructional design relevant to professional requirements: 2. Define Program Benchmark Statements: 3. Mechanism for Monitoring the effectiveness of the program: ***(Minimum standards must adhere to "UGC Open and Distance Learning Programmes and Online Programmes Regulations, 2020" & directions of the Statutory Bodies of the University)**	develop research attitude. University has policy to review and revise every course at least once in five years of its launching. The following key result areas will be closely monitored. i. Enrolment of student (Equated Access) ii. Equal weightage for each credit in student evaluation iii. Demonstrate in-depth knowledge of Environmental Science, both in theory and practical iv. Examination Results v. Placements/satisfaction of passing out students vi. Administrative/stakeholder feedback

B. Duration & Nomenclature

Name of Programme :-	M.Sc. in Zoology
Medium	English
Year	2 Years
Level	PG
Academic Session	2023-24
Entry Qualification (as per the Specification of Degrees, 2014)	B.Sc. with Zoology at FY and SY/ B.Sc. (Agri) Degree or Equivalent pass
Duration (as per the Specification of Degrees, 2014)	2 Years
Name of the Department	Science

C. Mode of Evaluation

Year	2023	
Whether Weightages to continuous assessment and end semester examinations or term end examinations as per clause mentioned in Regulations	Yes 1. 30% - 70% weightage Pattern for theory 2. 50% - 50% Weightage pattern for Practical/OJT/FP/RP	
Examination Scheme	Formative and Summative	
Percentage of Continuous Assessment (%)	Theory	30%
	Practical/OJT/FP/RP	50%
Percentage of Term End Examination (%)	Theory	70%
	Practical/OJT/FP/RP	50%
Pass or Fail Criteria 40%	40% for Pass	

Pass/Fail Criteria (% Pass Marks)	40% and above - Pass Below 40 % - Fail

D. Mode of Examination

Whether examination through Online (For ODL Programs)	No

E. SLM Development (Submit all SLM in PDF in Pendrive and prepare the SLM availability sheet in the order as per sample in PDF for each program separately)

Particulars	% SLM in house developed	% SLM in collaboration with HEI (It should not be more than 40% of total SLM. If it is in collaboration then provide MOU in Soft & Hard copy
Printing Material	100%	-
Audio-Video Material	-	-
Online Material	Yes [PDF of SLMs]	-
Compute based Material	-	-

F. Program wise faculty details (Requirement of Minimum three faculties not below the rank of Assistant Professor to be furnished in the following format - to be taken from Establishment

Sr. No.	Emp. No.	Name of the Faculty	Designation	Date of Joining	Qualification	Specialization	Teaching experience	Address	Phone No.	Email	Appointment letter
1	Y941	Mr. Sachin Jangam	Academic Coordinator	04/01/2020	M.Sc Zoology	Zoology	4 Years	YCMOU	9623107639	Sachinjangam58@gmail.com	01/01/2020
2	Y958	Mr. Rahul Navale	Academic Coordinator	20/02/2020	M.Sc Zoology, MBA Marketing	Zoology	4 Years	YCMOU	8999980785	rahulnavale1995@gmail.com	18/02/2020
3	Y1050	Mr. Ravindra Bharsat	Academic Coordinator	09/03/2024	M.Sc Zoology SET-Life Science	Zoology	2 Years	YCMOU	9665768152	bharsatravindra12@gmail.com	04/03/2024
4	1067	Dr. Jagruti Chavan	Academic Coordinator	11/03/2024	M.Sc. , SET, Ph.D (Environmental Sciences)	Environmental Sciences	9 years	YCMOU	8554894494	sos.evs@ycmou.ac.in	04/03/2024

G. List of Learner Support Centres Program wise and Region wise to be submitted as per following format. (We have intimated the same to Director SSD. You are requested to give him the list of programs for which the LSCs data is required.) – to be taken from SSD Director

Sr. No	Study centre code	Name & Address of LSC	Name of the HEI to which college/Institute is affiliated (where LSC is established)	Whether the College /Institute Private or Govt. (where LSC is established)	Name and Contact Details of Coordinator/ counsellor	Qualification of Coordinator/ Counsellor	No. of Counsellor	Name of Proposed Programmes/ Course from July, 2023 onwards	Approved	Not Approved with Reason

Appendix – I

Programme Objectives, Scope of the Programme & Programme Outcomes (PO)

And

Course Outcomes (CO)

<table>
<tr><td colspan="3">Programme Name: Master of Science (Mathematics)</td></tr>
<tr><td>1</td><td>Programme Objectives</td><td>This programme has the following broad objectives:
Inculcate critical thinking and analytical skills to enable students to pursue higher studies and research in Life Sciences or related allied fields of Zoology.
Provide a strong foundation for a better understanding of current advances in Zoology and its practical significance.
Expose students to current trends in research about Zoology.</td></tr>
<tr><td>2</td><td>Scope of the Programme</td><td>After successful completion of the M.Sc. programme, the learner has ample opportunities to use their mathematical knowledge in different areas:
Career opportunities in both private and government sector/ in India and abroad.
Job opportunities in sectors like Marine industries, NMCs, Pest Control, zoological parks. Applied business like fisheries, apiculture, sericulture, pearl culture, etc.
Inculcation of research attitude.
Inculcation of entrepreneurship.
Perceive higher education and research in the same or allied fields like veterinary science.</td></tr>
<tr><td>3</td><td>Programme Outcome</td><td>After successful completion of this programme, students will be able to
Develop deeper understanding of key concepts of Zoology at biochemical, molecular, cellular, physiological, histological and systematic level.
Impart knowledge and skills through applied disciplines.
Integrate and explore biological data. Use current laboratory setup, instrumentation, statistical and biological techniques in the collection, organization, analysis, interpretation and manipulating the data related to Zoology discipline and allied branches.</td></tr>
<tr><td>4</td><td>Course Outcomes</td><td>
<table>
<tr><th>SN</th><th>Course Code & Name</th><th>Course Outcomes</th></tr>
<tr><td colspan="3">Semester 1</td></tr>
<tr><td>1</td><td>ZOO501:</td><td>After successful completion of this course, student</td></tr>
</table>
</td></tr>
</table>

				Biochemistry	should be able to • Appreciate the foundation of life processes. • Explain the deep understand the structure of biomolecules. • Understand the thermodynamics of enzyme catalyzed reactions and mechanisms of energy production at cellular and molecular levels. • Understand the application of biochemistry.
			2	ZOO502: Cell Biology	After successful completion of this course, student should be able to • Explain the transport across cell, nuclear membrane; bioenergetics and metabolism. • Define the composition and organization of cytoskeleton. • Enumerate and explain signaling molecules and their receptors. How the cell cycle is regulated? The students will have an idea of stem cells and its applications. • Basic principles and application of microscopy, cell culture and flow cytometry.
			3	ZOO503: Applied Zoology Part-I	After successful completion of this course, student will be able to • Students gain knowledge and skill in the fundamentals of animal sciences, understands the complex interactions among various living organisms. • Analyse complex interactions among the various animals of different phyla, their distribution and their relationship with the environment.
			4	ZOO504: Lab on Biochemistry, Cell Biology & Applied Zoology Part-I	After successful completion of this course, student will be able to • Frame a scientific question or problem. • Undertake investigations and perform analyses about biochemical problems. • The structures and purposes of basic components of prokaryotic and eukaryotic cells, especially macromolecules, membranes, and organelles
			5	RES505: Research Methodology	After successful completion of this course, student will be able to • Understand some basic concepts of research and its methodologies. • Select proper method of Data collection & representation • Select and apply appropriate statistical method for data analysis. • Perform literature review, research writings

				with the knowledge of Intellectual Property Rights.
		6	ZOO506: Developmental Biology	After successful completion of this course, student should be able to • Explain the molecular and genetic background of animal development. • Describe evolutionary history of complex multicellular life forms. • Compare environmental influence on development and homeostasis of animals.
		7	ZOO507: Entomology	After successful completion of this course, student should be able to • To study the physiology of male and female reproductive axis and reproductive cycles. • To develop understanding of endocrinology of pregnancy, parturition and lactation. • To understand the interrelationship between reproduction and immunity. • To study the seasonality in reproduction.
		Semester 2		
		8	ZOO509: Molecular Biology	After successful completion of this course, student should be able to • Understand molecular processes viz. Replication, transcription, translation etc. • Underlying survival and propagation of life at molecular level. • Understand how genes are ultimately expressed as proteins which are responsible for the structure and function of all organisms. • Learn how four sequences (3 letter codons) generate the transcripts of life and determine the phenotypes of organisms. 4. Will be able to design and implement experimental procedures using relevant techniques.
		9	ZOO510: Genetics	After successful completion of this course, student should be able to • Aware about genetic diseases, their types and causes. • Understand molecular techniques that provide improvement, diagnosis and management of these diseases. • The principles of inheritance, linkage and crossing over which lead to variations will be made clear as well as the application thereof in gene mapping.
		10	ZOO511: Applied Zoology Part-	After successful completion of this course, student should be able to • Understands about parasites and

			II	epidemiology of parasites in human and animals. • Use of recombinant DNA technology in genetic manipulations and in a variety of industrial processes.
		11	ZOO512: Lab on Molecular Biology, Genetics & Applied Zoology Part-II	After successful completion of this course, student should be able to • Students will demonstrate ability to use evolutionary theory and related equations to model and predict population change or stability. • The student will gain a basic understanding on human genetics and hereditary. • Students gain knowledge and skill in the fundamentals of animal sciences, understands the complex interactions among various living organisms.
		12	ZOO513: OJT	After successful completion of this course, student should be able to – Students will demonstrate proficiency in applying theoretical knowledge and academic concepts to real-world professional situations. Students will possess job-specific skills that are relevant to their chosen field of study, enabling them to perform tasks and responsibilities effectively and efficiently. Students will acquire a comprehensive understanding of industry practices, trends, and challenges, contributing to their overall knowledge and expertise in the field. Students will establish professional networks and relationships, expanding their professional connections and opportunities for future collaborations and career advancement. Students will develop problem-solving and critical thinking abilities, demonstrating the ability to analyze complex situations, make informed decisions, and propose effective solutions. Students will demonstrate professionalism, adaptability, and effective communication skills in a professional work environment.
		13		After successful completion of this course, student should be able to –

			ZOO514: FP	Demonstrate the ability to apply theoretical knowledge and concepts to real-world situations, effectively bridging the gap between academia and practical applications. Develop advanced research and investigative skills, including the ability to design and execute research projects, collect and analyze data, and draw well-founded conclusions. Conduct independent research, demonstrating the ability to formulate research questions, design appropriate methodologies, and independently execute fieldwork or data collection. Exhibit effective collaboration and communication skills, demonstrating the ability to work collaboratively with others, engage in professional dialogue, and effectively communicate their research findings to diverse audiences. Showcase advanced problem-solving and critical thinking abilities, demonstrating the capacity to identify and address challenges encountered during fieldwork, analyze complex data, and propose innovative solutions. Demonstrate a thorough understanding of ethical considerations, field safety protocols, and best practices in their chosen field of study.
			14 ZOO515: Animal Biotechnology	After successful completion of this course, student should be able to • Understand and appreciate major public concerns and issues associated with Animal Biotechnology. • Have an understanding and grasp of international research environment where the frontiers of knowledge in Animal Biotechnology are under research. • Be able to adapt and respond positively and flexibly to changing circumstances. • Develop the professional skills and personal attributes to deal with complex issues, both systematically and creatively. • Have the capacity for individual work and teamwork. • Be lifelong learners with intellectual and practical skills.

		15	ZOO516: Toxicology	After successful completion of this course, student should be able to • Students will demonstrate an understanding of the core concepts of the science of toxicology, including hazard identification, exposure assessment, dose-response assessment and an understanding of the mechanisms of action and effects of toxic chemicals at multiple levels of biological organization. • Students will demonstrate an understanding of the role for the science of toxicology in society, including the importance of risk analysis, management and communication. Students will be able to identify and discuss contemporary issues in toxicology. • Students will be familiar with technical aspects and experimental approaches in toxicological research, testing and risk assessment.
		Semester 3		
		16	ZOO601: Immunology	After successful completion of this course, student should be able to • Understanding about Immune System & its mechanisms. • Explain Ag-antibody reaction. • Various techniques used in Immunology.
		17	ZOO602: Endocrinology	After successful completion of this course, student should be able to • To develop an understanding of the basic endocrinology. • To study the endocrine regulatory molecules mediating physiology and behavior. • To study the neural and endocrine components of physiological function and neuroendocrine regulation. • To understand the role of hormones in metabolic regulation and maintaining homeostasis. • To understand the integrative working of signaling system.
		18	ZOO603: Biodiversity	After successful completion of this course, student should be able to • Understand key scientific concepts for species

				Conservation	and ecosystem conservation. • Understand and apply the concept of species of conservation interest/concern. • Identify ecological requirements and maintaining factors for priority species and ecosystems.
			19	ZOO604: Lab on Immunology, Endocrinology and Biodiversity & Conservation	After successful completion of this course, student should be able to • Demonstrate the basic knowledge of immunological processes at a cellular and molecular level. • Define central immunological principles and concepts. • Ability to elicit a proper history and relevant clinical findings. • Understand and apply the concept of species of conservation interest/concern. Identify ecological requirements and maintaining factors for priority species and ecosystems. • Be able to conduct a threat assessment for a site. Know how to identify conservation targets and priorities in a systematic way.
			20	ZOO605: Research Project	After successful completion of this course, student should be able to • Frame research problem & do literature survey about the same • Do independent thinking • Learn basic techniques for carrying out research
			21	ZOO606: Reproductive Physiology	After successful completion of this course, student should be able to • To study the physiology of male and female reproductive axis and reproductive cycles. • To develop understanding of endocrinology of pregnancy, parturition and lactation. • To understand the interrelationship between reproduction and immunity. • To study the seasonality in reproduction.
			22	ZOO607: Vermiculture	After successful completion of this course, student should be able to • Understanding the role of worm farming in Modern Farming. • Understanding the potential of vermicompost as an alternative to chemical fertilizers. • Role of vermicultre in maintaining the health of soil and humans.

				• Economic importance of vermiculture. • Role of Vermiculture in protecting the environment and managing the waste.
		23	ZOO608: Animal Behavior	After successful completion of this course, student should be able to • Understand and identify the animal behavior in General. • Discuss the proximate and ultimate causes of various behaviours. • Design and implement experiments to test hypotheses relating to animal behaviour. • Understand about the molecules, cells, and systems of biological timing systems • Conceptualizing how species profitably inhabit in the temporal environment and space out their activities at different times of the day and seasons.
		Semester 4		
		24	ZOO609: Animal Physiology	After successful completion of this course, student should be able to • Understand various functional components of an organism body. • Analyse the complexities and interconnectedness of these functional components. • Identify the mechanism underlying maintenance of homeostasis of the body. • Infer the regulatory mechanisms for maintenance of function in the body.
		25	ZOO610: Ichthyology	After successful completion of this course, student should be able to • Utilize the knowledge in fish biology researches. • Manage the fish under controlled conditions, and understand the status of fish biogenetic resources of India.
		26	ZOO611: Lab on Animal Physiology & Ichthyology	After successful completion of this course, student should be able to • To give students competent lab skills in animal physiology. • To prepare students to carry out independent research in post graduate studies (e.g. Master's degree) or independent investigation in a biological related field (health care, law, etc.). • Learn basic external and internal anatomy of fish, and understand how fish biologists use

					characters to identify and classify fish. • Gain a basic understanding of the ecology of fishes and aquatic ecosystems.
		27	ZOO612: Research Project	After successful completion of this course, student should be able to • Frame research problem & do literature survey about the same • Do independent thinking • Learn basic techniques for carrying out research
		28	ZOO613: Comparative Animal Physiology	After successful completion of this course, student should be able to • An understanding of the various physiological systems of animals. • An understanding of structural differences in the physiological systems of animals from varied habitats an understanding of the functional differences in animals physiological systems.
		29	ZOO614: Aquaculture	After successful completion of this course, student should be able to • Will be able to define the basic features of aquaculture. • Express the importance of aquaculture. • Recognize the fish farming technology and equipment. • Will be able to express the problems in aquaculture. • Explain the problems in aquaculture farm construction and water for aquaculture. • Explain the diseases and the parasite problems in aquaculture
		30	ZOO615: Parasitology	After successful completion of this course, student should be able to • They will be able to recognize of parasites which are important for human health and caused disease. • They recognize specific and nonspecific parasites to human. • They comprehension biological characteristic of human parasites. • They will be able to define human parasites after identify of them.

Appendix – II

Evaluation Pattern

SN	Type of Course	Continuous Assessment (CA)	End Examination (EE)
1	Theory (T) 4 Credit 100 Marks CA: 30% EE: 70%	Each student is required to attempt total 02 (Two) "Continuous Assessments (CAs)" for each course of each Semester, as per the following details: 1. CA01: 'Continuous Assessment 01 (CA01)' on Credit 01 to Credit 04 of each course, consists of • 2 (Two) 'Short Answer Questions (SAQs)',each carrying 05 Marks, on Credit 01 and Credit 02 **and** • 1 (One) 'Long Answer Question (LAQ)' of 10 Marks, on Credit 03 and Credit 04. LAQ may consist of sub-questions. **CA01**: On Credit 01 to Credit 04, of Marks = (5x2 + 10) = **20 Marks** 2. CA02: 'Continuous Assessment 02 (CA02)' on Credit 01 to Credit 04 of each course, consists of • A test containing total **10** (Ten) 'Objective Type Questions, ' 05 (Five) on Credit 01 and Credit 02,and05 (Five) on Credit 03 and Credit 04. Each 'Objective Type Question' of 1 Mark. **CA02**: On Credit 01 to Credit 04, of Marks = **10 Marks** 3. Maximum number of attempts for **CA,** during each semester : Single attempt only 4. **Total Marks**: **30** Marks	1. Student is required to answer **05 'VSAQs' out of 06 'VSAQs'**, each carrying 03 Marks, on Credit 01 to 04, for total 15 Marks. One VSAQ will be on each Credit. 2. Student is required to answer **05 'SAQs' out of 06 'SAQs'**, each carrying 05 Marks, on Credit 01 to 04, for total 25 Marks. One SAQ will be on each Credit. 3. Student is required to answer 01 **'LAQ' out of 2 LAQs,** of 10 Marks on Credit 01 and Credit 02, for total 10 Marks. LAQ may consist of sub-questions. 4. Student is required to answer 01 **'LAQ' out of 2 LAQs,** of 10 Marks on Credit 03 and Credit 04, for total 10 Marks. LAQ may consist of sub-questions. 5. Student is required to answer 01 **'LAQ' out of 2 LAQs,** of 10 Marks on Credit 01 to Credit 04, for total 10 Marks. LAQ may consist of sub-questions. 6. Number of attempts: Till Valid Registration Period (VRP) only 7. Marks: 70 Marks 8. Duration: 150 minutes

<table>
<tr><th>SN</th><th>Type of Course</th><th colspan="2">Continuous Assessment (CA)</th><th>End Examination (EE)</th></tr>
<tr><td></td><td></td><td colspan="2"><table>
<tr><th>SN</th><th>Description</th><th>Evaluation of End Examination(EE)</th><th>Marks</th></tr>
<tr><td rowspan="3">1</td><td rowspan="3">Question Types</td><td>Very Short Answer Question (VSAQ) on each Credit</td><td>03 Marks</td></tr>
<tr><td>Short Answer Question (SAQ) on each Credit</td><td>05 Marks</td></tr>
<tr><td>On each Credit, either Single Long Answer Question (LAQ) or LAQ contains sub-questions (a), (b) and so on.</td><td>10 Marks</td></tr>
<tr><td>2</td><td>Grand Total Marks</td><td>Total five Questions in EE Question paper based on:
Credit 01 to 04 : 05 VSAQs out of 06 VSAQs (15 Marks)
Credit 01 to 04 : 05 SAQs out of 06 SAQs (25 Marks)
Credit 01 to 02 : 01 LAQ out of 02 LAQs (10 Marks)
Credit 03 to 04 : 01 LAQ out of 02 LAQs (10 Marks)
Credit 01 to 04 : 01 LAQ out of 02 LAQs (10 Marks)
LAQ may contains sub-questions</td><td>70 Marks</td></tr>
</table></td><td></td></tr>
<tr><td>2</td><td>Theory (T)

2 Credit
50 Marks

CA: 30%
EE: 70%</td><td colspan="2">Each student is required to attempt total 01 (One) “Continuous Assessment (CA)” for each course of each Semester, as per the following details:
1. CA01: 1 (One) ‘Continuous Assessment 01 (CA01)’ on Credit 01 and Credit 02 of each course, consists of
• 1 (One) ‘Short Answer Question (SAQ)’ of 5 Marks
and
• 1 (One) ‘Long Answer Question (LAQ)’of 10 Marks, LAQ may consist of sub-questions.
CA01: On Credit 01 and Credit 02, of Marks = (5 + 10) = 15 Marks
2. Maximum number of attempts for CA, during each semester: Single attempt only
3. Total Marks: 15 Marks</td><td>1. Student is required to answer 05 ‘VSAQs’ out of 06 ‘VSAQs’, each carrying 03 Marks, on Credit 01 to 02, for total 15 Marks. One VSAQ will be on each Credit.
2. Student is required to answer 02 ‘SAQs’ out of 03 ‘SAQs’, each carrying 05 Marks, on Credit 01 to 02, for total 10 Marks. One SAQ will be on each Credit.
3. Student is required to answer 01 ‘LAQ’ out of 2 LAQs, of 10 Marks on Credit 01 and Credit 02, for total 10 Marks. LAQ may consist of sub-questions.
4. Number of attempts: Till Valid Registration Period (VRP) only
5. Marks: 35 Marks
6. Duration: 75 minutes</td></tr>
</table>

<table>
<tr><th>SN</th><th>Type of Course</th><th colspan="3">Continuous Assessment (CA)</th><th colspan="3">End Examination (EE)</th></tr>
<tr><td></td><td></td><td></td><td colspan="5"><table>
<tr><td>SN</td><td>Description</td><td colspan="2">Evaluation of End Examination (EE)</td><td>Marks</td></tr>
<tr><td rowspan="3">1</td><td rowspan="3">Question Types</td><td colspan="2">Very Short Answer Question (VSAQ) on each Credit</td><td>03 Marks</td></tr>
<tr><td colspan="2">Short Answer Question (SAQ) on each Credit</td><td>05 Marks</td></tr>
<tr><td colspan="2">On each Credit, either Single Long Answer Question (LAQ) or LAQ contains sub-questions (a), (b) and so on.</td><td>10 Marks</td></tr>
<tr><td>2</td><td>Grand Total Marks</td><td colspan="2">Total three Questions in EE Question paper based on:
Credit 01 to 02 : 05 VSAQs out of 06 VSAQs (15 Marks)
Credit 01 to 02 : 02 SAQs out of 03 SAQs (10 Marks)
Credit 01 to 02 : 01 LAQ out of 02 LAQs (10 Marks)
LAQ may contains sub-questions</td><td>35 Marks</td></tr>
</table></td></tr>
</table>

<table>
<tr><th>SN</th><th>Type of Course</th><th>Continuous Assessment (CA)</th><th>End Examination (EE)</th></tr>
<tr><td>3</td><td>Practical (P)

4 Credit
100 Marks

CA: 50%
EE: 50%</td><td>1. Student is required to submit “Activity Report in Work-Book Format” for each Credit in the prescribed format.
2. Maximum number of attempts for each CA, during each semester : Single attempt only
3. Marks: 50 Marks
4. Grading criteria:
<table>
<tr><td>Lab Punctuality, Preparedness & Ethics</td><td>Irregular in lab. Copies the experiment from others
(0 Points)</td><td>Consistently regular but unable to explain the concepts
(06 Points)</td><td>Punctuality in lab. Follows the procedure and responds to questions asked
(10 Points)</td></tr>
<tr><td>Activity Report and Performance

(Experiment No, Date, Objectives, Apparatus with specification, Observations, Graphs, software used if any)</td><td>Poor Documentation and copied the experiment from others.
Couldn't perform the Activity /poor observation made
(04 Points)</td><td>Average Documentation: Report is in format but some of the formatting guidelines are missed.
Performed the Activity but observations made with some mistakes
(12 Points)</td><td>Good Documentation: Lab activity writing is in proper format with all references, Grammar.
Performed the Activity on time observations made with no mistakes
(20 Points)</td></tr>
<tr><td>Results and Conclusion</td><td>Unable to achieve the desired results but makes attempts to relate data to theory. Poor concluding statements
(08 Points)</td><td>Average graphical and tabulated representation with misinterpret physical significance of theory. Achieve the desired results and but insufficient conclusion statement.
(14 Points)</td><td>Analyses and interpret observed data carefully with good graphical and tabulated representation using appropriate theory/evidence. Achieve the results and reach to appropriate Conclusion
(20 Points)</td></tr>
</table></td><td>External and internal examiners shall assess each student based on:
1. Workbook/Activity Report submission by the student (Only by External Examiner) [05 Marks]
2. Practical Activity performed by the student [12 Marks]
3. Result and Conclusion of the Practical Activity [13 Marks]
4. Viva-Voce on Practical Activities [20 Marks]
5. Number of attempts: Till Valid Registration Period (VRP) only
6. Marks: 50 Marks
7. Duration: 180 minutes</td></tr>
</table>

<table>
<tr><th>SN</th><th>Type of Course</th><th colspan="2">Continuous Assessment (CA)</th><th colspan="2">End Examination (EE)</th></tr>
<tr><td></td><td></td><td colspan="2"><table>
<tr><td rowspan="2">SN</td><td colspan="3">Evaluation of Practical End Examination</td></tr>
<tr><td>Description</td><td>Internal Examiner</td><td>External Examiner</td></tr>
<tr><td>1</td><td>Workbook/Activity Report</td><td>-</td><td>05 Marks</td></tr>
<tr><td>2</td><td>Actual Conduct of one randomly selected Practical Activity</td><td>02 Marks</td><td>10 Marks</td></tr>
<tr><td>3</td><td>Diagram, Synoptic Answers, Graph/Observation and Conclusion</td><td>03 Marks</td><td>10 Marks</td></tr>
<tr><td>4</td><td>Viva-Voce/Oral</td><td>05 Marks</td><td>15 Marks</td></tr>
<tr><td>5</td><td>Total</td><td>10 Marks</td><td>40 Marks</td></tr>
</table></td><td colspan="2"></td></tr>
<tr><td>4</td><td>Field Project (TW)

4 Credit
100 Marks

CA: 50%
EE: 50%</td><td colspan="2">Students need to complete one month Field Project (Total Study hours 120 hrs including Activity Report). After completion of the field project, learners shall submit a report to the LSC - Programme Coordinator (PC) and Mentor/Guide.
1. Maximum number of attempts for each CA, during each semester: Single attempt only
2. Duration: 1 Month or 4 Weeks duration –i) After end examination of semester 02 and before beginning of semester 03 or
ii) Any one month during semester 02 duration
3. Marks: 50 Marks
4. Grading Criteria for Evaluation of FP (only by Mentor/Guide):
<table>
<tr><td>SN</td><td>Description</td><td>Marks</td></tr>
<tr><td>1</td><td>Key Definitions of Problem area and analysis of preliminary data</td><td>15</td></tr>
<tr><td>2</td><td>Work related to formats, Correspondence, Interactions and liaising etc</td><td>05</td></tr>
<tr><td>3</td><td>Field work and data collection</td><td>15</td></tr>
<tr><td>4</td><td>Analysis and Report</td><td>10</td></tr>
<tr><td>5</td><td>Feedback to community</td><td>05</td></tr>
<tr><td colspan="2">Total</td><td>50</td></tr>
</table></td><td colspan="2">1. External and Internal examiners (Internal examiner - Programme Coordinator (PC) / Supervisor of LSC) shall assess each student based on:
a. Activity Report submission by the student (Only by External Examiner) [10 Marks]
b. Viva-Voce on Activity Report [40 Marks]
2. Number of attempts: Till Valid Registration Period (VRP) only
3. Marks: 50 Marks
4. Duration: 180 minutes</td></tr>
</table>

<table>
<tr><th>SN</th><th>Type of Course</th><th colspan="2">Continuous Assessment (CA)</th><th colspan="3">End Examination (EE)</th></tr>
<tr><td></td><td></td><td></td><td colspan="4"><table>
<tr><td rowspan="2">SN</td><td colspan="3">Evaluation of Field Project End Examination</td></tr>
<tr><td>Description</td><td>Internal Examiner
(Programme Coordinator
(PC)/ Supervisor of LSC)</td><td>External Examiner</td></tr>
<tr><td>1</td><td>Workbook/Report submission</td><td>-</td><td>10 Marks</td></tr>
<tr><td>2</td><td>Viva-Voce /Oral</td><td>10 Marks</td><td>30 Marks</td></tr>
<tr><td>3</td><td>Total</td><td>10 Marks</td><td>40 Marks</td></tr>
</table></td></tr>
</table>

<table>
<tr><th>SN</th><th>Type of Course</th><th>Continuous Assessment (CA)</th><th>End Examination (EE)</th></tr>
<tr><td>5</td><td>OJT or Internship (TW)

4 Credit
100 Marks

CA: 50%
EE: 50%</td><td>
1. Students need to complete one month On Job Training (OJT) or Internship (Total Study hours 120 hrs including Internship Report) in any Industry/Organization/Institute/ R&D Division /Any Micro/ Small/ Medium/ enterprise/Govt/NGO/PSU/Online Internship related to major course.
2. Maximum number of attempts for each CA, during each semester: Single attempt only
3. Marks: 50 Marks
4. Duration: 1 Month or 4 Weeks –
i) After end examination of semester 02 and before beginning of semester 03.
or
ii) Any one month during semester 02 duration
5. Grading Criteria for Evaluation of OJT (or Intern) only by Mentor where the Internship is proposed to be imparted:
<table>
<tr><th>SN</th><th>Parameters</th><th>Marks Out of</th></tr>
<tr><td>1</td><td>Behaviors, Shows interest in assigned work, Willingness to learn</td><td>10</td></tr>
<tr><td>2</td><td>Accepts responsibility, Cooperates with co-workers and supervisors, Demonstrates organizational skills</td><td>10</td></tr>
<tr><td>3</td><td>Uses time, knowledge and expertise effectively, Analyzes problems effectively</td><td>10</td></tr>
<tr><td>4</td><td>Demonstrates creativity/ originality / any innovative contribution, Professional ethics and accountability</td><td>10</td></tr>
<tr><td>5</td><td>Writes effectively, Produces high quality work/Skill Proficiency</td><td>10</td></tr>
<tr><td colspan="2">Total</td><td>50</td></tr>
</table>
Document as Evidence: Activity report along with Certificate or Declaration, duly issued and signed by the concerned authority [To be assessed during EE] should be submitted during End Examination to the parent Learner support Centre (LSC).
</td><td>
At the end of second semester, Programme Coordinator (PC)/ Supervisor of LSC and 1 (one) External Examiner will complete ‘End Exam (EE)’ for all allotted students as follows:
1. Duration of EE: After Theory EE of second Semester
2. Programme Coordinator (PC)/ Supervisor of LSC and External Expert will have 20% and 80% weightage respectively in EE.
3. Number of attempts: Till Valid Registration Period (VRP) only
4. Marks for EE: 50 Marks
<table>
<tr><th>Parameter</th><th>PC /Supervisor of LSC</th><th>External Expert</th></tr>
<tr><td>Professional Attitude</td><td>-</td><td>05 Marks</td></tr>
<tr><td>Maintenance of Daily Diary</td><td>-</td><td>10 Marks</td></tr>
<tr><td>Internship Report</td><td>05 Marks</td><td>10 Marks</td></tr>
<tr><td>Viva/Oral</td><td>05 Marks</td><td>15 Marks</td></tr>
<tr><td>Total</td><td>10 Marks</td><td>40 Marks</td></tr>
</table>
</td></tr>
</table>

<table>
<tr><th>SN</th><th>Type of Course</th><th>Continuous Assessment (CA)</th><th>End Examination (EE)</th></tr>
<tr><td>6</td><td>Project Work (PW)

RP-I
4 Credit
100 Marks

CA: 50%
EE: 50%</td><td>1. Student is required to submit “Activity Report” based on Grading Criteria of the course in the prescribed format.
2. Maximum number of attempts for each CA, during each semester: Single attempt only
3. Marks: 50Marks
4. Grading Criteria:
<table>
<tr><td>SN</td><td>Desc</td><td>Marks</td></tr>
<tr><td>1</td><td>Seminar*</td><td>25</td></tr>
<tr><td>2</td><td>Research Proposal</td><td>25</td></tr>
</table>
*To be conducted in Online/Offline mode at LSC.</td><td>1. External and internal examiners shall assess each student based on:
a. Project Report submission by the student (Only by External Examiner) [10 Marks]
b. Project Presentation by the student [20 Marks]
c. Viva-Voce on Project Report [20 Marks]
2. Number of attempts: Till Valid Registration Period (VRP) only
3. Marks: 50 Marks
4. Duration: 180 minutes</td></tr>
<tr><td></td><td></td><td colspan="2">
<table>
<tr><td rowspan="2">SN</td><td colspan="3">Evaluation of Project Work End Examination</td></tr>
<tr><td>Description</td><td>Internal Examiner</td><td>External Examiner</td></tr>
<tr><td>1</td><td>Project Report</td><td>-</td><td>10 Marks</td></tr>
<tr><td>2</td><td>Project Presentation</td><td>05 Marks</td><td>15 Marks</td></tr>
<tr><td>3</td><td>Viva-Voce /Oral</td><td>05 Marks</td><td>15 Marks</td></tr>
<tr><td>4</td><td>Total</td><td>10 Marks</td><td>40 Marks</td></tr>
</table>
</td></tr>
<tr><td>7</td><td>Project Work (PW)

RP-II

6 Credit
150 Marks

CA: 50%
EE: 50%</td><td>1. Student is required to submit “Activity Report” based on Grading Criteria of the course in the prescribed format.
2. Maximum number of attempts for each CA, during each semester: Single attempt only
3. Marks: 75 Marks
4. Grading Criteria:
<table>
<tr><td>SN</td><td>Desc</td><td>Marks</td></tr>
<tr><td>1</td><td>Seminar*</td><td>30</td></tr>
<tr><td>2</td><td>Research Paper Presentation**</td><td>30</td></tr>
<tr><td>3</td><td>Project Report</td><td>15</td></tr>
</table>
*To be conducted in Online/Off line mode at LSC.
** Journals/Conferences/ at LSC, in Online/Offline mode [This activity shall be organized by respective LSC in Online/Offline mode in case student didn’t get an opportunity for presentation at Journals/Conferences]</td><td>1. External and internal examiners shall assess each student based on:
a. Project Report submission by the student (Only by External Examiner) [20 Marks]
b. Project Presentation by the student [25 Marks]
c. Viva-Voce on Project Report [30 Marks]
2. Number of attempts: Till Valid Registration Period (VRP) only
3. Marks: 75 Marks
4. Duration: 180 minutes</td></tr>
</table>

<table>
<tr><th>SN</th><th>Type of Course</th><th colspan="2">Continuous Assessment (CA)</th><th colspan="2">End Examination (EE)</th></tr>
<tr><td></td><td></td><td colspan="2"><table>
<tr><td rowspan="2">SN</td><td colspan="3">Evaluation of Project Work End Examination</td></tr>
<tr><td>Description</td><td>Internal Examiner</td><td>External Examiner</td></tr>
<tr><td>1</td><td>Project Report</td><td>-</td><td>20 Marks</td></tr>
<tr><td>2</td><td>Project Presentation</td><td>05 Marks</td><td>20 Marks</td></tr>
<tr><td>3</td><td>Viva-Voce /Oral</td><td>10 Marks</td><td>20 Marks</td></tr>
<tr><td></td><td>Total</td><td>15 Marks</td><td>60 Marks</td></tr>
</table></td><td colspan="2"></td></tr>
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DEB-UGC application for Programme approval for AY 2023-24

School of Sciences, YCMOU Nashik

(Formerly School of Architecture, Science and Technology)

Programme Project Report (PPR)

M.Sc. (Chemistry)

A. **Programme project report** (PPR)

Name of Program :		
a	Programme's mission & objectives	**Mission**: This M.Sc. programme is uniquely designed to impart essential knowledge in all major areas of fundamental, pure or applied Chemistry. This programme offers an exciting opportunity for specialization in Chemistry to Chemical Industry, pharmaceutical companies, hospitals, medical schools, private clinics, research centres; they can pursue roles in research and development, quality control, and analytical laboratories. They can also explore opportunities in academia, where they can contribute to teaching and mentoring future chemists and so on. **Objectives**: The 'M.Sc. (Chemistry)' Program will- • To study critical thinking and analytical skills to enable students to pursue higher studies and research in Chemistry. To expose students to current trends in research about Chemistry. • To explore scientific reasoning and quantitative analysis. Our majors will be able to apply chemical concepts to solve qualitative and quantitative problems. • To study provide a strong foundation for a better understanding of current advances in Chemistry and its practical significance. To perform statistical analysis of chemical data by developing analytical mind. • To discuss Laboratory practice and safety. In order to learn the ways in which new scientific knowledge is created, our majors will experience how chemists interpret chemical and physical phenomena through experimental

		investigation. • To study the Principles of mass spectroscopy, gas chromatography and HPLC. Apply the techniques for structure determination of organic molecules. To demonstrate the mechanism of various reactions. Provide job opportunities in allied sectors [Engineering, chemical, pharma & petroleum industries, Indian Forest Services, National Chemical Laboratories, Scientist, academic career in institutions as **lecturers and professors or a scientific career** in various scientific positions. They can also go and work **as Researchers and as administrators** etc.]
b	Relevance of the program with HEI's Mission and Goals	Objects of the YCMOU (as per the YCMOU Act) which would be fulfilled by implementing the proposed program (a) To provide through instruction, teaching and training and other educational opportunities, access to larger and larger segment of population, and in particular to the disadvantaged groups such as those living in remote and rural areas including working people, housewives and other adults who wish to upgrade or acquire knowledge through studies in various fields; [1(a)] (b) To strengthen and diversify the degrees, diploma and certificate courses at various educational levels, to fulfil the knowledge, skills and development needs of the individuals, institutions and society in general, by relating, particularly, the courses, to the needs of the employment and economic development of the state on the basis of its natural and human resources; [1(b)] (c) To promote acquisition of knowledge in a rapidly developing and changing society and to continually offer opportunity of upgrading knowledge, training and skills in the context of innovations, research and discovery in all field of human endeavour by developing educational network with the use of modern communication media and technologies appropriate for a learning society; [1(c)] (d) To provide an innovative system of

		University level education, flexible and open, in regard to the methods and pace of learning, combination of courses, eligibility for enrolment, age of entry, conduct of examinations and operation of the program, with a review to promote learning and encourage excellence in all fields of knowledge; [1(d)] (e) To contribute to the improvement of the education system in the state by providing a non-formal channel complementary to the formal system and encouraging transfer of credits and exchange of teaching staff by making a wide use of text and other software developed by the University; [1(e)] (f) To develop innovative, need based Vocational courses and establish industry, institution linkage for developing the society; [1(f)] (g) To provide through incidental and non-formal means, for continuing and extension of education in various cultural forms, arts, crafts and skills of the country, raising their quality and improving their availability to the people; [1(g)] (h) To provide for the counseling and guidance to its students; [1(j)] (i) To provide major part of its resources and direct efforts in designing, developing and offering need-based and relevant vocational courses. [1(l)]
c	Nature of prospective target group of learners	Candidates with B.Sc. (PCM/PCB) /B.Sc. with Chemistry at FY and SY or Equivalent pass. Although, similar PG Program on offer from the conventional institutes, conventional educational system offers very little freedom to learners as regards to when, where, how to learn. Proposed Program aims to provide this freedom to learners to the maximum possible extent.
d	Appropriateness of programme to be conducted in Open and Distance Learning mode to acquire specific skills and competence Specify the expected learning outcomes in terms of: 1. Knowledge Attainment: 2. Skills and Competencies: 3. Compliances of academic,	Proposed Program aims to provide relevant skills as needed by the working professional to identify, and solve challenging problems in environment, thus contributing to the ever increasing demands of the society/industry. The program helps to develop scientific tempers and attitudes, which in turn can prove to be beneficial for the society since the scientific developments can make a nation or society to grow at a rapid pace. After studying critical

	professional & occupational standards:	thinking and analytical skills to enable students to pursue higher studies and research in Chemistry. To expose students to current trends in research about Chemistry. The Principles of mass spectroscopy, gas chromatography and HPLC. Apply the techniques for structure determination of organic molecules. To demonstrate the mechanism of various reactions. This program uses the Open and Distance(ODL) Mode of Education- Theory, Practical/ Project component of teaching-learning is offered as face to face counseling by the qualified and experienced teacher at recognized LSC along with continuous assessment and offline materials/ resources in printed book format/Soft copy format. Hence, this program is appropriate to conduct in Open and Distance Learning mode to acquire specified skills and competence.

e Instructional Design

Instructional Design :

1. Curriculum Design (***Outcome of Expert Committee meeting; Program Structure: specify the theory, practical, fieldwork, project, etc. components***):
2. Total Credit Points (*including course wise*):
3. Detailed Syllabi:
4. Duration of the program (***Minimum & Maximum***):
5. Medium of Instruction:
6. Type of Program (***General***

Semester pattern: This programme is of total 4 semesters. Distribution of the credits are as follows –

Sem	Mandatory Courses (DSC)			Elective Courses (DSE) (4 CR)	Other Courses 4 CR/ 6 CR	Total Courses (CR)
	Theory		Practical 4 CR			
	4 CR	2 CR				
1	2	1	1	1	1 – Research Methodology (4 CR)	**6** (22 CR)
2	2	1	1	1	Any one - OJT/ Field Projects (4 CR)	**6** (22 CR)
3	2	1	1	1	1- Research Project (4 CR)	**6** (22 CR)
4	2	-	1	1	1- Research Project (6 CR)	**5** (22 CR)
Total	8 x 4 = 32	3 x 2 = 06	4 x 4 = (16 CR)	4 x 4 = (16 CR)	3 x 4 + 1 x 6 = (18 CR)	**23** (88 CR)
	(38 CR)					

Programme Structure:

SN	Course Category	Code	Course Name	CA	EE	TM	Type	CR	Min %

***/Technical/ Professional*):**

7. Faculty and Support Staff:
8. Instructional Design & Delivery Mechanism **(*Media to be used -print, audio, video, online, computer aided, web based, etc. (course wise)*):**

Student Support Service System **(*Specify the provisions to be made at Head Quarter, Regional Centers, Learner Support Centers and Web based, etc*):**

[Level 6.0] Semester 01: 22 Credits									
01	Mandatory (DSC)	CHE 501	Inorganic Chemistry-I	30	70	100	T	4	40%
02	Mandatory (DSC)	CHE 502	Physical Chemistry-I	30	70	100	T	4	40%
03	Mandatory (DSC)	CHE 503	Organic Chemistry-I	15	35	100	T	2	40%
04	Mandatory (DSC)	CHE 504	Lab Activities on CHE501, CHE502 & CHE503	50	50	50	P	4	40%
05	RM	RES 505	Research Methodology	30	70	100	T	4	40%
Elective (DSE)Courses (Select Any One)									
06	Elective (DSE)	CHE 506	Physical Methods in Chemistry	30	70	100	T	4	40%
07	Elective (DSE)	CHE 507	Polymer Chemistry	30	70	100	T	4	40%
[Level 6.0] Semester 02 : 22 Credits									
08	Mandatory (DSC)	CHE 509	Inorganic Chemistry-II	30	70	100	T	4	40%
09	Mandatory (DSC)	CHE 510	Physical Chemistry-II	30	70	100	T	4	40%
10	Mandatory (DSC)	CHE 511	Organic Chemistry-II	15	35	100	T	2	40%
11	Mandatory (DSC)	CHE 512	Lab Activities on CHE509, CHE510 & CHE511	50	50	50	P	4	40%
12	OJT/FP	CHE 513 CHE 514	Any one OJT or FP OJT FP	50	50	100	TW	4	40%
Elective (DSE)Courses (Select Any One)									
13	Elective (DSE)	CHE 515	Analytical Chemistry	30	70	100	T	4	40%
14	Elective (DSE)	CHE 516	Chemical mathematics & Biostatistics	30	70	100	T	4	40%
Exit option: PGD 14- CHE (44 Credits) after Three Year UG Degree									
[Level 6.5] Semester 03 : 22 Credits									
15	Mandatory (DSC)	CHE601	Organic Reaction Mechanism	30	70	100	T	4	40%

16	Mandatory (DSC)	CHE602	Stereochemistry	30	70	100	T	4	40%
17	Mandatory (DSC)	CHE603	Advanced Synthetic Methods	15	35	100	T	2	40%
18	Mandatory (DSC)	CHE604	Lab Activities on CHE601, CHE602 & CHE603	50	50	50	P	4	40%
19	RP	CHE605	Research Project	50	50	100	PW	4	40%
Elective (DSE)Courses (Select Any One)									
20	Elective (DSE)	CHE606	Green Chemistry	30	70	100	T	4	40%
21	Elective (DSE)	CHE607	Drugs & Heterocyclic	30	70	100	T	4	40%
22	Elective (DSE)	CHE608	Biotechnology	30	70	100	T	4	40%
[Level 6.5] Semester 04 : 22 Credits									
23	Mandatory (DSC)	CHE609	Advance Organic Chemistry	30	70	100	T	4	40%
24	Mandatory (DSC)	CHE610	Advanced Organic Spectroscopy	30	70	100	T	4	40%
25	Mandatory (DSC)	CHE611	Lab Activities on CHE609 & CHE610	30	70	100	T	4	40%
26	RP	CHE612	Research Project	75	75	150	PW	6	40%
Elective (DSE)Courses (Select Any One)									
27	Elective (DSE)	CHE613	Natural Products	30	70	100	T	4	40%
28	Elective (DSE)	CHE614	Industrial Organic Chemistry	30	70	100	T	4	40%
29	Elective (DSE)	CHE615	Pharmaceutical Chemistry	30	70	100	T	4	40%

Total Credits: 88 and Total Courses: 23 (without electives) & 29 (with electives)

Detailed Syllabi: Available at **https://drive.google.com/drive/folders/13lNyj1PT7qN-AAAi2eE8fwDAsCQFWMQz?tid=0B451Yjwt_acQR1VPSUQ4Qotvams**

- Programme Outcomes and Course Outcomes: Refer Appendix - I

		Minimum programme duration: 2 years **Maximum Programme Duration**: 4 years **Medium of Instruction**: English **Type of Program:** General **Faculty and Support Staff:** Dr. Chetana Kamlaskar, Director, School of Sciences, Dr. Bharat P. More, Mr. Ghanshyam S. Patil (Academic coordinator) & Dr. Dnyaneshwar Irappa Bhusanur (Academic coordinator), School of Sciences. **Instructional Design & Delivery Mechanism** : • **Minimum number of face-to-face counseling sessions:** 12 (for 4 Credits) • (For each theory type of course of 4 credits duration of each counseling session shall be 01 Clock Hour) • (For each Practical/Project type of course of 4 credits duration of each counseling session shall be 02 Clock Hour). • **Minimum number of face-to-face counseling sessions:** 6 (for 2 Credits) • (For each theory type of course of 2 credits duration of each counseling session shall be 01 Clock Hour) • **Minimum number of face-to-face counseling sessions:** 18 (for 6 Credits) • (For each Practical/Project type of course of 6 credits duration of each counseling session shall be 02 Clock Hour). • **Required study efforts**: Total 2640 Hours (including Self-Study) during all 4 semesters. • **Attendance**: Minimum 80 % attendance recommended for all activity type of courses • **eBook**: eBook in SLM format for each course (Free Download from University website) at all semesters 01 to semester 04 **Student Support Service System**: At headquarter: Support from School, SSD, Evaluation Division and Exam Unit-3 At Regional Centers: From all 8 regional centers within MH At Learner Support Centers: Recognized Learner support centers within MH Web Based: http://ycmou.digitaluniversity.ac http://www.ycmou.ac.in
f	Procedure for admissions,	**Admissions procedure**: A customized "Online

<table>
<tr>
<td></td>
<td>curriculum transaction and evaluation
1. Define the Admission Policy (including web based tools to be adopted:
2. Eligibility Criteria:
3. Fee Structure:
4. Financial Assistance to Learners (if any):
5. Activity planner of all academic activities of the academic session:
Policy for Evaluation of learner progress along with methods and tools:</td>
<td>Annual Admission system” available at DU portal http://ycmou.digitaluniveristy.ac
Online payment facility is made available using a credit card or debit card or internet banking.
Admission Eligibility: B.Sc.(PCM/PCB) /B.Sc. with Chemistry at FY and SY or Equivalent pass
Total programme Fee: Total ₹ 46,316 for all 04 Semesters, which is duly approved by the university authorities.
Curriculum Transaction:
• 01 SLM e-Book will be developed for each theory course
• Total 12/06 Face-To-Face counseling sessions, each of 60 Minutes duration, will be provided at respective learner support center, for each theory course.
• Total 12/18 Face-To-Face counseling sessions, each of 120 Minutes duration, will be provided at respective learner support center, for each practical/Field Project/OJT/Research Project course.
• Curriculum updation will be after every 3 years
Activity planner:
Teaching-Learning of students admitted in a single academic year shall start from 01-Sep. every year. (For all Programmes)
<table>
<tr><th>SN</th><th>Activity Description</th><th>Odd semesters like
c1, 03, 05 and 07
From 01-Sep Till 31-Jan</th><th>Even semesters like
02, 04, 06 and c8
From 01-Feb Till 31-Jul</th></tr>
<tr><td colspan="4">Admission: offered on Annual basis collectively for 2 semesters in each academic year.</td></tr>
<tr><td>01</td><td>Fresh and Further Yearly Admission</td><td>From June Till Aug</td><td>NA</td></tr>
<tr><td colspan="4">Teaching - Learning</td></tr>
<tr><td>02</td><td>Teaching – Learning (16 Weeks) & Backlog Clearing</td><td>From 01-Aug Till 21-Nov</td><td>From 01-Feb Till 23-May</td></tr>
<tr><td colspan="4">End Exam (EE) Form Submission (Required only for Repeater Students)</td></tr>
<tr><td>03</td><td>Online EE Form Submission by SCs/ students at University</td><td>On or Before 21-Oct</td><td>On or Before 23-Apr</td></tr>
<tr><td colspan="4">Continuous Assessment (CA) Submission</td></tr>
<tr><td>05</td><td>CA Availability</td><td>From 01-Sep Till 21-Nov</td><td>From 01-Mar Till 23-May</td></tr>
<tr><td>06</td><td>CA Submission by Students</td><td>From 01-Nov Till 30-Nov</td><td>From 01-May Till 31-May</td></tr>
<tr><td colspan="4">End Examination (EE)</td></tr>
<tr><td>07</td><td>End Exam for Theory Courses</td><td>From 25-Nov to 05-Dec</td><td>From 25-May to 05-Jun</td></tr>
<tr><td>08</td><td>EE for Activity Courses (Pr, TW, PW, STW, SV)</td><td>Immediately after the last day of end exam for theory courses, but positively before 15-Dec</td><td>Immediately after the last day of end exam for theory courses, but positively before 15-Jun</td></tr>
<tr><td>10</td><td>End Exam Result Declaration</td><td>On or Before 31-Jan</td><td>On or Before 31-Jul</td></tr>
<tr><td colspan="4">Semester End Vacation</td></tr>
<tr><td>11</td><td>Semester End Vacation</td><td>Jan</td><td>July</td></tr>
</table>
Policy:
Refer Evaluation pattern given in Appendix II.</td>
</tr>
<tr>
<td>g</td>
<td>Requirement of the Laboratory Support and Library Resources:
1. Laboratory Support to the learners (if</td>
<td>Laboratory requirement and Library Resources – Yes. Institutes/Colleges affiliated with conventional university offering M.Sc. (Chemistry) will be only recognized as a Learner support center of this university for this programme. So, requirement of laboratory support and</td>
</tr>
</table>

	any): 2. Provision of Practical book for learners (*if any*): 3. Provision of Virtual Reality Methods for Practical in case of Online learning (*if any*):	library resources will be automatically ensured. **Recommended**: Computer infrastructure with Wi-Fi/broadband connection with Chemistry related software/tool.
h	Cost Estimate of the Program and the Provisions: 1. Indicate the Budgetary Requirement for: 1.Programme Development 2.Program Delivery 3.Program Maintenance	Budget provision for this development under A.27.P.38 Fees/Royalties/ Honorarium to Writer/Editors/Trans.
i	Quality Assurance Mechanism and expected Program Outcomes*: 1. Define the Review Mechanism of the Program for enhancing the standards of curriculum, instructional design relevant to professional requirements: 2. Define Program Benchmark Statements: 3. Mechanism for Monitoring the effectiveness of the program: ***(Minimum standards must adhere to "UGC Open and Distance Learning Programmes and**	M.Sc. (Chemistry) programme is designed to provide scientific as well as professional level competency to learners, and offers advanced theoretical as well as practical knowledge to learners. This programme enables the learner to develop interest in knowing more about the environment and to develop research attitude. University has policy to review and revise every course at least once in five years of its launching. The following key result areas will be closely monitored. i. Enrolment of student (Equated Access) ii. Equal weightage for each credit in student evaluation iii. Demonstrate in-depth knowledge of Chemistry, both in theory and practical iv. Examination Results v. Placements/satisfaction of passing out students vi. Administrative/stakeholder feedback

	Online Programmes Regulations, 2020" & directions of the Statutory Bodies of the University)	

B. **Duration & Nomenclature**

Name of Programme :-	M.Sc. Chemistry
Medium	English
Year	2 Years
Level	PG
Academic Session	2023-24
Entry Qualification (as per the Specification of Degrees, 2014)	B.Sc.(PCM/PCB) /B.Sc. with Chemistry at FY and SY or Equivalent pass
Duration (as per the Specification of Degrees, 2014)	2 Years
Name of the Department	School of Sciences

C. **Mode of Evaluation**

Year	2023	
Whether Weightages to continuous assessment and end semester examinations or term end examinations as per clause mentioned in Regulations	Yes 1. 30% - 70% weightage Pattern for theory 2. 50% - 50% Weightage pattern for Practical/OJT/FP/RP	
Examination Scheme	Formative and Summative	
Percentage of Continuous Assessment (%)	Theory	30%
	Practical/OJT/FP/RP	50%
Percentage of Term End Examination (%)	Theory	70%
	Practical/OJT/FP/RP	50%
Pass or Fail Criteria	40% for Pass	
Pass/Fail Criteria (% Pass Marks)	40% and above - Pass Below 40 % - Fail	

D. Mode of Examination

Whether examination through Online (For ODL Programs)	No

E. SLM Development (Submit all SLM in pdf in pen drive and prepare the SLM availability sheet in the order as per sample in pdf for each program separately)

Particulars	% SLM in house developed	% SLM in collaboration with HEI (It should not be more than 40% of total SLM .If it is in collaboration then provide MOU in Soft & Hard copy

Printing Material	100%	-
Audio-Video Material	-	-
Online Material	Yes [pdf of SLMs]	-
Compute based Material	-	-

F. Program wise faculty details (Requirement of Minimum three faculties not below the rank of Assistant Professor to be furnished in the following format – to be taken from Establishment

Sr. No.	Emp. No	Name of the Faculty	Designation	Date of Joining	Qualification	Specialization	Teaching experience	Address	Phone no.	Email	Appointment letter
1	Y947	Dr. Bharat Pralhad More	Academic Coordinator	13/01/2020	M.Sc. Chemistry, Ph.D.	Organic Chemistry	16 Years	YCMOU	9175456300	bhrtmre@gmail.com	13/01/2020
2		Mr. Ghanshyam Sahebrao Patil	Academic Coordinator	15/03/2022	M.Sc. Chemistry B.Ed.	Chemistry	10 Years	YCMOU	9561564264	ghanshaympatil1@gmail.com	02/03/2022
3	Y1051	Dr. Dnyaneshwar Irappa Bhusanur	Academic Coordinator	11/03/2024	M.Sc. Chemistry NET(JRF), GATE, Ph.D	Organic Chemistry	NA	YCMOU	8698052565	dnyaneshwarbhusanur@gmail.com	04/03/2024
4	1067	Dr. Jagruti Chavan	Academic Coordinator	11/03/2024	M.Sc. , SET, Ph.D (Environmental Sciences)	Environmental Sciences	9 years	YCMOU	8554894494	sos.evs@ycmou.ac.in	04/03/2024

G. List of Learner Support Centres Program wise and Region wise to be submitted as per following format – to be taken from SSD Director

Sr. No.	Study centre code	Name & Address of LSC	Name of the HEI to which college/Institute is affiliated (where LSC is established)	Whether the College /Institute Private or Govt. (where LSC is established)	Name and Contact Details of Coordinator/ counsellor :	Qualification of Coordinator/ Counsellor :	No. of Counsellor :	Name of Proposed Programmes/ Course from July, 2023 onwards:	Approved	Not Approved with Reason

Appendix – I

Programme Objectives, Scope of the Programme & Programme Outcomes (PO)

And

Course Outcomes (CO)

Programme Name: Master of Science (Chemistry)		
1	**Programme Objectives**	The objectives of this course are • To study critical thinking and analytical skills to enable students to pursue higher studies and research in Chemistry. To expose students to current trends in research about Chemistry. • To explore scientific reasoning and quantitative analysis. Our majors will be able to apply chemical concepts to solve qualitative and quantitative problems. • To study provide a strong foundation for a better understanding of current advances in Chemistry and its practical significance. To perform statistical analysis of chemical data by developing analytical mind. • To discuss Laboratory practice and safety. In order to learn the ways in which new scientific knowledge is created, our majors will experience how chemists interpret chemical and physical phenomena through experimental investigation. • To study the Principles of mass spectroscopy, gas chromatography and HPLC. Apply the techniques for structure determination of organic molecules. To demonstrate the mechanism of various reactions.
2	**Scope of the Programme**	After successful completion of this programme, students may get opportunities in various fields/sectors to work as • Career opportunities in both private and government sector/ in India and abroad. • Job opportunities in sectors like chemical, pharma & petroleum industries, Indian Forest Services, National Chemical Laboratories, Scientist, etc. • Inculcation of research attitude. • Inculcation of entrepreneurship. • Perceive higher education and research in the same or allied fields. • Candidates who have advanced qualifications can pursue either an academic career in institutions as lecturers and professors or a scientific career in various scientific positions. • They can also go and work as Researchers and as administrators.

<table>
<tr><td>3</td><td>Programme Outcome</td><td>After successful completion of this programme, students will be able to
Inculcate critical thinking and analytical skills to enable students to pursue higher studies and research in Chemistry. Expose students to current trends in research about Chemistry.
Use key concepts of inorganic and organometallic chemistry including those related to synthesis, reaction chemistry, and structure and bonding.
Apply the knowledge to develop the sustainable and eco-friendly technology in Industrial Chemistry.
Formulate the macroscopic and quantum laws of the absorption of light by molecules and solids. Describe the various deactivation processes of molecular excited states. Characterize the kinetics of deactivation processes and their role in the photochemical reactivity.
Understand the Principles of mass spectroscopy, gas chromatography and HPLC. Apply the techniques for structure determination of organic molecules. Understand the mechanism of various reactions.</td></tr>
<tr><td>4</td><td>Course Outcomes</td><td>
<table>
<tr><th>SN</th><th>Course Code & Name</th><th>Course Outcomes</th></tr>
<tr><td colspan="3">Semester 1</td></tr>
<tr><td>1</td><td>CHE501: Inorganic Chemistry-I</td><td>After successful completion of this course, student should be able to
Explain the nuclear structure, stable and unstable atomic nuclei, and nuclear reactions.
Analyse selected crystal structures explain what kind of parameters that affect the crystal structure of a compound and perform calculations of the lattice enthalpy of ionic compounds.
Analyse the various defects and its application on inorganic crystals. Explain the fundamentals of metallic clusters.
Understand the periodic properties of the different groups of compounds focusing on production methods and application of selected elements and compounds.
Evaluate the structure and bonding in molecules and predict the structure of molecules.</td></tr>
<tr><td>2</td><td>CHE502: Physical Chemistry-I</td><td>After successful completion of this course, student should be able to
Solve the problems related to 1D box.
Explore the role of operators in quantum.
Understand the solve questions basis on rates of</td></tr>
</table>
</td></tr>
</table>

				different reactions. • Evaluate the concept of group theory to predict the spectroscopic properties of molecules • Use to differentiate between different theories of kinetics.
		3	CHE503: Organic Chemistry-I	After successful completion of this course, student should be able to • Recognize either molecule is aromatic, non-aromatic or anti-aromatic. • Describe mechanism of different aliphatic nucleophilic substitution reactions. • Understand the potential energy diagrams. • Apply a versatile knowledge of different name reactions and their application in synthesis. • Explore the different organic reaction mechanisms
		4	CHE504: Lab Activities on CHE501, CHE502 & CHE503	After successful completion of this course, student should be able to • Build technical skill • Generalize the qualitative analysis by semi micro-qualitative analysis method. Understand the basic concept and advantages of semi- micro qualitative analysis. • Apply the techniques to prepare of inorganic complexes. • Analyze the systematic separations of d-block elements. Evaluate the d-block elements with their special tests. • Apply the step wise procedure to predict the anions along with metals
		5	RES505: Research Methodology	After successful completion of this course, student should be able to – • Select and apply appropriate research designs based on the research question or problem. • Formulate clear and relevant research questions or hypotheses. • Analyze and interpret data using appropriate statistical techniques. • Identify and address ethical considerations in research, ensuring the protection of participants

				and data integrity. • Develop critical thinking skills in evaluating research studies, identifying strengths and weaknesses, and proposing improvements
		6	CHE506: Physical Methods in Physical Chemistry	After successful completion of this course, student should be able to • Understand about electron spectroscopy and thermal analysis. • Analyze Circular Dichroism and Optical Rotatory Dispersion. • Explore the Electron Spin Resonance spectroscopy • Analyze about flame emission spectroscopy. • Apply the spectroscopic concepts for separation and identification of mixture compounds/ complex/ metals
		7	CHE507: Polymer Chemistry	After successful completion of this course, student should be able to • Explaining the basic concepts of polymer. Techniques & Kinetics of polymer. • Explore the Study of crystalline nature & degree of crystallinity. • Understand polymer degradation & polymer reactions. • Analyze stereochemistry of polymers & determination of molecular weight.
		Semester 2		
		8	CHE509: Inorganic Chemistry-II	After successful completion of this course, student should be able to • Explain the theories of bonding in coordination compounds. • Comprehend the kinetics and mechanisms of reactions of complex compounds. • Explore the magnetic properties of coordination compounds. • Analyze the types of coordination compounds like metal carbonyls, carbocyclic pi complex in coordination compounds • Evaluate the geometries of simple molecules.

		9	CHE510: Physical Chemistry-II	After successful completion of this course, student should be able to • Explain the thermodynamics and Non-ideal systems • Describe about the third law of thermodynamics • Understand the classical Maxwell-Boltzmann and quantum statistics • Know about partition functions and determining thermodynamic properties • Understand heat capacity of solids. • Use the thermodynamic factors in various organic synthesis processes (how the reaction condition and reaction rate various depend on the thermodynamic factors).
		10	CHE511: Organic Chemistry-II	After successful completion of this course, student should be able to • Recognize either molecule is aromatic, non-aromatic or anti-aromatic. • Describe mechanism of different aliphatic nucleophilic substitution reactions. • Understand the potential energy diagrams. • Apply a versatile knowledge of different name reactions and their application in synthesis. • 5. Explore the different organic reaction mechanisms
		11	CHE512: Lab Activities on CHE 509, CHE 510 & CHE 511	After successful completion of this course, student should be able to • Get knowledge about the heat of solution, determination of molecular weight and Distribution coefficient. • Apply the basic concepts of conductometric titrations to determine the ionic strength. • Explain the various laws in electrochemistry. • Apply the conductometric method for the solutions and measure its conductivity. Give practice to handle the conductivity meter, spectrophotometer. • Evaluate distribution co-efficient influence the solubility of various systems.

		12	CHE513: OJT	After successful completion of this course, student should be able to – • Students will demonstrate proficiency in applying theoretical knowledge and academic concepts to real-world professional situations. • Students will possess job-specific skills that are relevant to their chosen field of study, enabling them to perform tasks and responsibilities effectively and efficiently. • Students will acquire a comprehensive understanding of industry practices, trends, and challenges, contributing to their overall knowledge and expertise in the field. • Students will establish professional networks and relationships, expanding their professional connections and opportunities for future collaborations and career advancement. • Students will develop problem-solving and critical thinking abilities, demonstrating the ability to analyse complex situations, make informed decisions, and propose effective solutions. • Students will demonstrate professionalism, adaptability, and effective communication skills in a professional work environment.
		13	CHE514: FP	After successful completion of this course, student should be able to – • Students will demonstrate the ability to apply theoretical knowledge and concepts to real-world situations, effectively bridging the gap between academia and practical applications. • Students will develop advanced research and investigative skills, including the ability to design and execute research projects, collect and analyse data, and draw well-founded conclusions. • Students will conduct independent research, demonstrating the ability to formulate research questions, design appropriate methodologies, and independently execute fieldwork or data collection. • Students will exhibit effective collaboration and communication skills, demonstrating the ability to work collaboratively with others, engage in

				professional dialogue, and effectively communicate their research findings to diverse audiences. • Students will showcase advanced problem-solving and critical thinking abilities, demonstrating the capacity to identify and address challenges encountered during fieldwork, analyse complex data, and propose innovative solutions. • Students will demonstrate a thorough understanding of ethical considerations, field safety protocols, and best practices in their chosen field of study.
		14	CHE515: Analytical Chemistry	After successful completion of this course, student should be able to • Impart knowledge on the instrumentation of UV-Visible spectrometry and FT-IR • Comprehend the basic principles of Thermal methods, Polarography, powder and single crystal XRD techniques. • Understand the applications of these instrumental techniques in studying various physical and chemical phenomena.
		15	CHE516: Chemical Mathematics & Biostatics	After successful completion of this course, student should be able to • Understand the functions, differential & integral. • Explore the partial differentiation • Explain the Vectors, Matrices & Determinants • Analyze the statistics, probability & sampling. • Use the knowledge of basic statistical methods to solve problems. Students are taught to operate. • Use the statistical techniques in pharmaceuticals.
		Semester 3		
		16	CHE601: Organic Reaction Mechanism	After successful completion of this course, student should be able to • Explain the Molecularity. • Provide a versatile knowledge of different name reactions and their application in synthesis. • Understand learn about familiar Oxidation and Reduction reactions. Gain knowledge about

				reaction intermediates. • Use the principles and reaction mechanisms involving various Free radical reactions. • Analyse the different organic reaction mechanisms.
		17	CHE602: Stereochemistry	After successful completion of this course, student should be able to • Comprehend the membrane and receptors in drug delivery process. • Explore the various theoretical laws to predict the pharmaco-kinetics of the compounds. • Analyses the molecular receptor binding and molecular recognition of the natural and synthetic compounds.
		18	CHE603: Advanced Synthetic Methods	After successful completion of this course, student should be able to • Comprehend the fundamental knowledge on structure, reactivity and reaction mechanism of organic compounds. • Explore the organic transformations through disconnection approach. • Generalise application of spectroscopic techniques for compound characterization.
		19	CHE604: Lab Activities on CHE 601, CHE 602 & CHE 603	After successful completion of this course, student should be able to • Develop technical skill. Explain the basic principles about quantitative analyses. • Understand the concepts and systematic procedure in gravimetric analysis. • Apply the systematic procedure for estimation. • Analyze the synthesis method for in-organic co-ordination complexes • Analyze the molecules and identify its nature through chromatography technique. Create ideas and concepts for water treatment process, food science and forensic fields.
		20	CHE605: Research Project	After successful completion of this course, student should be able to • Use to develop technical skill. • Build empower our students with practical

					skills to comprehend the physiology and other functions of each and every vital systems.
		21	CHE606: Green Chemistry	After successful completion of this course, student should be able to • Comprehend the knowledge about the concept of Green chemistry. • Understand the 12 principles of Green chemistry as well as the tools of Green chemistry. • Apply how to evaluate a reaction or process and determine "Greener" alternatives. • Build focus on the application of greener routes to improve industrial processes and to produce important products. • Evaluate the greener synthetic pathway to produce pharmacological compounds. Understand the basics of Medicinal chemistry.
		22	CHE607: Drugs and Heterocyclic	After successful completion of this course, student should be able to • Generalise the classification, Chemical structure, production, properties and uses of Drug. • Understand the dyeing process on fibers. • Analyses the types of dyes in various applications • Use the Pollution Control in Drug Industry. Apply the various finishing process of Drug. • Explore this fundamental to fabricate the material and its dying process.
		23	CHE608: Biotechnology	After successful completion of this course, student should be able to • Generalise the classification on proteins & types of enzymes • Understand the structural model of DNA, Chemical composition, structure and functions of RNA. • Analyses the Microscopy & Spectroscopy • Use the Fundamentals of Computers & Bioinformatics. • Explore the Commercial potentials of

				Biotechnology.
		Semester 4		
		24	CHE609: Advanced Organic Chemistry	After successful completion of this course, student should be able to • Know about versatile knowledge of rearrangements • Explain the different organic (radical and concerted) reactions and their applications in synthesis. Implement this basic concept to design and produce the new organic molecules. • Analyze the principles of conformational analysis and stereochemistry. • Describe the concepts in organic photochemistry. • Aanalyze the various theories in pericyclic reactions.
		25	CHE610: Advanced Organic Spectroscopy	After successful completion of this course, student should be able to • Explain the Electronic spectroscopy. Understand about IR spectroscopy. Describe the basic concept of NMR spectroscopy • Apply the different aspects of NMR spectroscopy to predict the structure of compounds. • Analyze about the mass spectroscopy and Mossbauer spectroscopy. • Evaluate about the invaluable tools in synthetic chemistry for the confirmation of • Known molecules and elucidation of shape and structures of unknown compounds of high complexity with a high degree of certainty.
		26	CHE611: Lab Activities on CHE 609 & CHE 610	After successful completion of this course, student should be able to • Develop technical skill. Explain the basic principles about quantitative analyses. • Understand the concepts and systematic procedure in gravimetric analysis. • Apply the systematic procedure for estimation. • Analyze the synthesis method for in-organic co-ordination complexes

					• Analyze the molecules and identify its nature through chromatography technique. Create ideas and concepts for water treatment process, food science and forensic fields.
			27	CHE612: Research Project	After successful completion of this course, student should be able to • Use to develop technical skill. • Build empower our students with practical skills to comprehend the physiology and other functions of each and every vital systems.
			28	CHE613: Natural Products	After successful completion of this course, student should be able to • Comprehend the Importance of natural products. • Understand the terpenoids and its application. Knowledge about steroids and its synthesis. • Explore the importance of alkaloids in medicinal field and its synthesis • Analyze the various proteins and enzymes. • Apply the concepts present in the nucleic acids.
			29	CHE614: Industrial Organic Chemistry	After successful completion of this course, student should be able to • Use the concept of retro synthesis and the terms involved • Comprehend about the one group and two group disconnections • Explore the various protection and deprotection of important functional groups • Apply the use of important reagents in organic synthesis. Explain the selected name reactions in Organic synthesis. • Generalise them a brief idea on organic synthesis in industries.
			30	CHE615: Pharmaceuticals Chemistry	After successful completion of this course, student should be able to • Develop analytical instrumental techniques for identification, characterization and quantification of drugs. • Describe different techniques of organic synthesis, mechanisms, their application to process chemistry and drug discovery.

				• Understanding of interactions between medications in the body. Discuss the fundamental of volumetric analysis, significance of quality control in pharmaceutical analysis and use methods of concentration expression.

Appendix II

Evaluation Pattern

SN	Type of Course	Continuous Assessment (CA)	End Examination (EE)
1	Theory (T) 4 Credit 100 Marks CA: 30% EE: 70%	Each student is required to attempt total 02 (Two) "Continuous Assessments (CAs)" for each course of each Semester, as per the following details: 1. CA01: 'Continuous Assessment 01 (CA01)' on Credit 01 to Credit 04 of each course, consists of • 2 (Two) 'Short Answer Questions (SAQs)',each carrying 05 Marks, on Credit 01 and Credit 02 **and** • 1 (One) 'Long Answer Question (LAQ)' of 10 Marks, on Credit 03 and Credit 04. LAQ may consist of sub-questions. **CA01**: On Credit 01 to Credit 04, of Marks = (5x2 + 10) = **20 Marks** 2. CA02: 'Continuous Assessment 02 (CA02)' on Credit 01 to Credit 04 of each course, consists of • A test containing total **10** (Ten) 'Objective Type Questions, ' 05 (Five) on Credit 01 and Credit 02,and 05 (Five) on Credit 03 and Credit 04. Each 'Objective Type Question' of 1 Mark. **CA02**: On Credit 01 to Credit 04, of Marks = **10 Marks** 3. Maximum number of attempts for **CA,** during each semester : Single attempt only 4. **Total Marks**: **30** Marks	1. Student is required to answer **05 'VSAQs' out of 06 'VSAQs'**, each carrying 03 Marks, on Credit 01 to 04, for total 15 Marks. One VSAQ will be on each Credit. 2. Student is required to answer **05 'SAQs' out of 06 'SAQs'**, each carrying 05 Marks, on Credit 01 to 04, for total 25 Marks. One SAQ will be on each Credit. 3. Student is required to answer **01 'LAQ' out of 2 LAQs,** of 10 Marks on Credit 01 and Credit 02, for total 10 Marks. LAQ may consist of sub-questions. 4. Student is required to answer **01 'LAQ' out of 2 LAQs,** of 10 Marks on Credit 03 and Credit 04, for total 10 Marks. LAQ may consist of sub-questions. 5. Student is required to answer **01 'LAQ' out of 2 LAQs,** of 10 Marks on Credit 01 to Credit 04, for total 10 Marks. LAQ may consist of sub-questions. 6. Number of attempts: Till Valid Registration Period (VRP) only 7. Marks: 70 Marks 8. Duration: 150 minutes

<table>
<tr><th>SN</th><th>Type of Course</th><th colspan="2">Continuous Assessment (CA)</th><th>End Examination (EE)</th></tr>
<tr><td></td><td></td><td colspan="2"><table>
<tr><td>S N</td><td>Description</td><td>Evaluation of End Examination(EE)</td><td>Marks</td></tr>
<tr><td rowspan="3">1</td><td rowspan="3">Question Types</td><td>Very Short Answer Question (VSAQ) on each Credit</td><td>03 Marks</td></tr>
<tr><td>Short Answer Question (SAQ) on each Credit</td><td>05 Marks</td></tr>
<tr><td>On each Credit, either Single Long Answer Question (LAQ) or LAQ contains sub-questions (a), (b) and so on.</td><td>10 Marks</td></tr>
<tr><td>2</td><td>Grand Total Marks</td><td>Total five Questions in EE Question paper based on:
Credit 01 to 04 : 05 VSAQs out of 06 VSAQs (15 Marks)
Credit 01 to 04 : 05 SAQs out of 06 SAQs (25 Marks)
Credit 01 to 02 : 01 LAQ out of 02 LAQs (10 Marks)
Credit 03 to 04 : 01 LAQ out of 02 LAQs (10 Marks)
Credit 01 to 04 : 01 LAQ out of 02 LAQs (10 Marks)
LAQ may contains sub-questions</td><td>70 Marks</td></tr>
</table></td><td></td></tr>
<tr><td>2</td><td>Theory (T)

2 Credit
50 Marks

CA: 30%
EE: 70%</td><td colspan="2">Each student is required to attempt total 01 (One) “Continuous Assessment (CA)” for each course of each Semester, as per the following details:
1. CA01: 1 (One) ‘Continuous Assessment 01 (CA01)’ on Credit 01 and Credit 02 of each course, consists of
• 1 (One) ‘Short Answer Question (SAQ)’ of 5 Marks
and
• 1 (One) ‘Long Answer Question (LAQ)’of 10 Marks, LAQ may consist of sub-questions.
CA01: On Credit 01 and Credit 02, of Marks = (5 + 10) = 15 Marks
2. Maximum number of attempts for CA, during each semester: Single attempt only
3. Total Marks: 15 Marks</td><td>1. Student is required to answer 05 ‘VSAQs’ out of 06 ‘VSAQs’, each carrying 03 Marks, on Credit 01 to 02, for total 15 Marks. One VSAQ will be on each Credit.
2. Student is required to answer 02 ‘SAQs’ out of 03 ‘SAQs’, each carrying 05 Marks, on Credit 01 to 02, for total 10 Marks. One SAQ will be on each Credit.
3. Student is required to answer 01 ‘LAQ’ out of 2 LAQs, of 10 Marks on Credit 01 and Credit 02, for total 10 Marks. LAQ may consist of sub-questions.
4. Number of attempts: Till Valid Registration Period (VRP) only
5. Marks: 35 Marks
6. Duration: 75 minutes</td></tr>
</table>

<table>
<tr><th>SN</th><th>Type of Course</th><th colspan="2">Continuous Assessment (CA)</th><th colspan="2">End Examination (EE)</th></tr>
<tr><td></td><td></td><td colspan="4">
<table>
<tr><th>SN</th><th>Description</th><th>Evaluation of End Examination (EE)</th><th>Marks</th></tr>
<tr><td rowspan="3">1</td><td rowspan="3">Question Types</td><td>Very Short Answer Question (VSAQ) on each Credit</td><td>03 Marks</td></tr>
<tr><td>Short Answer Question (SAQ) on each Credit</td><td>05 Marks</td></tr>
<tr><td>On each Credit, either Single Long Answer Question (LAQ) or LAQ contains sub-questions (a), (b) and so on.</td><td>10 Marks</td></tr>
<tr><td>2</td><td>Grand Total Marks</td><td>Total three Questions in EE Question paper based on:
Credit 01 to 02 : 05 VSAQs out of 06 VSAQs (15 Marks)
Credit 01 to 02 : 02 SAQs out of 03 SAQs (10 Marks)
Credit 01 to 02 : 01 LAQ out of 02 LAQs (10 Marks)
LAQ may contains sub-questions</td><td>35 Marks</td></tr>
</table>
</td></tr>
<tr><td>3</td><td>Practical (P)

4 Credit
100 Marks

CA: 50%
EE: 50%</td><td colspan="2">1. Student is required to submit “Activity Report in Work-Book Format” for each Credit in the prescribed format.
2. Maximum number of attempts for each CA, during each semester : Single attempt only
3. Marks: 50 Marks
4. Grading criteria:
<table>
<tr><td>Lab Punctuality, Preparedness & Ethics</td><td>Irregular in lab. Copies the experiment from others
(0 Points)</td><td>Consistently regular but unable to explain the concepts
(06 Points)</td><td>Punctuality in lab. Follows the procedure and responds to questions asked
(10 Points)</td></tr>
<tr><td>Activity Report and Performance

(Experiment No, Date, Objectives, Apparatus with specification, Observations, Graphs, software used if any)</td><td>Poor Documentation and copied the experiment from others. Couldn't perform the Activity /poor observation made
(04 Points)</td><td>Average Documentation: Report is in format but some of the formatting guidelines are missed. Performed the Activity but observations made with some mistakes
(12 Points)</td><td>Good Documentation: Lab activity writing is in proper format with all references, Grammar. Performed the Activity on time observations made with no mistakes
(20 Points)</td></tr>
<tr><td>Results and Conclusion</td><td>Unable to achieve the desired results but makes attempts to relate data to theory. Poor concluding statements
(08 Points)</td><td>Average graphical and tabulated representation with misinterpret physical significance of theory. Achieve the desired results and but insufficient conclusion statement.
(14 Points)</td><td>Analyses and interpret observed data carefully with good graphical and tabulated representation using appropriate theory/evidence. Achieve the results and reach to appropriate Conclusion
(20 Points)</td></tr>
</table>
</td><td colspan="2">External and internal examiners shall assess each student based on:
1. Workbook/Activity Report submission by the student (Only by External Examiner) [05 Marks]
2. Practical Activity performed by the student [12 Marks]
3. Result and Conclusion of the Practical Activity [13 Marks]
4. Viva-Voce on Practical Activities [20 Marks]
5. Number of attempts: Till Valid Registration Period (VRP) only
6. Marks: 50 Marks
7. Duration: 180 minutes</td></tr>
</table>

<table>
<tr><th>SN</th><th>Type of Course</th><th>Continuous Assessment (CA)</th><th>End Examination (EE)</th></tr>
<tr><td></td><td></td><td>
<table>
<tr><td rowspan="2">SN</td><td colspan="3">Evaluation of Practical End Examination</td></tr>
<tr><td>Description</td><td>Internal Examiner</td><td>External Examiner</td></tr>
<tr><td>1</td><td>Workbook/Activity Report</td><td>-</td><td>05 Marks</td></tr>
<tr><td>2</td><td>Actual Conduct of one randomly selected Practical Activity</td><td>02 Marks</td><td>10 Marks</td></tr>
<tr><td>3</td><td>Diagram, Synoptic Answers, Graph/Observation and Conclusion</td><td>03 Marks</td><td>10 Marks</td></tr>
<tr><td>4</td><td>Viva-Voce/Oral</td><td>05 Marks</td><td>15 Marks</td></tr>
<tr><td>5</td><td>Total</td><td>10 Marks</td><td>40 Marks</td></tr>
</table>
</td><td></td></tr>
<tr><td>4</td><td>Field Project (TW)

4 Credit
100 Marks

CA: 50%
EE: 50%</td><td>Students need to complete one month Field Project (Total Study hours 120 hrs including Activity Report). After completion of the field project, learners shall submit a report to the LSC - Programme Coordinator (PC) and Mentor/Guide.
1. Maximum number of attempts for each CA, during each semester: Single attempt only
2. Duration: 1 Month or 4 Weeks duration –i) After end examination of semester 02 and before beginning of semester 03 or
ii) Any one month during semester 02 duration
3. Marks: 50 Marks
4. Grading Criteria for Evaluation of FP (only by Mentor/Guide):
<table>
<tr><td>SN</td><td>Description</td><td>Marks</td></tr>
<tr><td>1</td><td>Key Definitions of Problem area and analysis of preliminary data</td><td>15</td></tr>
<tr><td>2</td><td>Work related to formats, Correspondence, Interactions and liaising etc</td><td>05</td></tr>
<tr><td>3</td><td>Field work and data collection</td><td>15</td></tr>
<tr><td>4</td><td>Analysis and Report</td><td>10</td></tr>
<tr><td>5</td><td>Feedback to community</td><td>05</td></tr>
<tr><td colspan="2">Total</td><td>50</td></tr>
</table>
</td><td>1. External and Internal examiners (Internal examiner - Programme Coordinator (PC) / Supervisor of LSC) shall assess each student based on:
a. Activity Report submission by the student (Only by External Examiner) [10 Marks]
b. Viva-Voce on Activity Report [40 Marks]
2. Number of attempts: Till Valid Registration Period (VRP) only
3. Marks: 50 Marks
4. Duration: 180 minutes</td></tr>
</table>

SN	Type of Course	Continuous Assessment (CA)	End Examination (EE)

SN	Evaluation of Field Project End Examination		
	Description	Internal Examiner (Programme Coordinator **(PC)/ Supervisor of LSC)**	External Examiner
1	Workbook/Report submission	-	10 Marks
2	Viva-Voce /Oral	10 Marks	30 Marks
3	Total	10 Marks	40 Marks

<table>
<tr><th>SN</th><th>Type of Course</th><th>Continuous Assessment (CA)</th><th>End Examination (EE)</th></tr>
<tr><td>5</td><td>OJT or Internship (TW)

4 Credit
100 Marks

CA: 50%
EE: 50%</td><td>
1. Students need to complete one month On Job Training (OJT) or Internship (Total Study hours 120 hrs including Internship Report) in any Industry/Organization/Institute/ R&D Division /Any Micro/Small/Medium/ enterprise/Govt/NGO/PSU/Online Internship related to major course.
2. Maximum number of attempts for each CA, during each semester: Single attempt only
3. Marks: 50 Marks
4. Duration: 1 Month or 4 Weeks –
i) After end examination of semester 02 and before beginning of semester 03.
or
ii) Any one month during semester 02 duration
5. Grading Criteria for Evaluation of OJT (or Intern) only by Mentor where the Internship is proposed to be imparted:
<table>
<tr><th>SN</th><th>Parameters</th><th>Marks Out of</th></tr>
<tr><td>1</td><td>Behaviors, Shows interest in assigned work, Willingness to learn</td><td>10</td></tr>
<tr><td>2</td><td>Accepts responsibility, Cooperates with co-workers and supervisors, Demonstrates organizational skills</td><td>10</td></tr>
<tr><td>3</td><td>Uses time, knowledge and expertise effectively, Analyzes problems effectively</td><td>10</td></tr>
<tr><td>4</td><td>Demonstrates creativity/ originality / any innovative contribution, Professional ethics and accountability</td><td>10</td></tr>
<tr><td>5</td><td>Writes effectively, Produces high quality work/Skill Proficiency</td><td>10</td></tr>
<tr><td colspan="2">Total</td><td>50</td></tr>
</table>
Document as Evidence: Activity report along with Certificate or Declaration, duly issued and signed by the concerned authority [To be assessed during EE] should be submitted during End Examination to the parent Learner support Centre (LSC).
</td><td>
At the end of second semester, Programme Coordinator (PC)/ Supervisor of LSC and 1 (one) External Examiner will complete ‘End Exam (EE)’ for all allotted students as follows:
1. Duration of EE: After Theory EE of second Semester
2. Programme Coordinator (PC)/ Supervisor of LSC and External Expert will have 20% and 80% weightage respectively in EE.
3. Number of attempts: Till Valid Registration Period (VRP) only
4. Marks for EE: 50 Marks
<table>
<tr><th>Parameter</th><th>PC /Supervisor of LSC</th><th>External Expert</th></tr>
<tr><td>Professional Attitude</td><td>-</td><td>05 Marks</td></tr>
<tr><td>Maintenance of Daily Diary</td><td>-</td><td>10 Marks</td></tr>
<tr><td>Internship Report</td><td>05 Marks</td><td>10 Marks</td></tr>
<tr><td>Viva/Oral</td><td>05 Marks</td><td>15 Marks</td></tr>
<tr><td>Total</td><td>10 Marks</td><td>40 Marks</td></tr>
</table>
</td></tr>
</table>

<table>
<tr><th>SN</th><th>Type of Course</th><th>Continuous Assessment (CA)</th><th>End Examination (EE)</th></tr>
<tr><td>6</td><td>Project Work (PW)

RP-I
4 Credit
100 Marks

CA: 50%
EE: 50%</td><td>1. Student is required to submit “Activity Report” based on Grading Criteria of the course in the prescribed format.
2. Maximum number of attempts for each CA, during each semester: Single attempt only
3. Marks: 50Marks
4. Grading Criteria:
<table>
<tr><td>SN</td><td>Desc</td><td>Marks</td></tr>
<tr><td>1</td><td>Seminar*</td><td>25</td></tr>
<tr><td>2</td><td>Research Proposal</td><td>25</td></tr>
</table>
*To be conducted in Online/Offline mode at LSC.</td><td>1. External and internal examiners shall assess each student based on:
a. Project Report submission by the student (Only by External Examiner) [10 Marks]
b. Project Presentation by the student [20 Marks]
c. Viva-Voce on Project Report [20 Marks]
2. Number of attempts: Till Valid Registration Period (VRP) only
3. Marks: 50 Marks
4. Duration: 180 minutes</td></tr>
<tr><td></td><td></td><td colspan="2">
<table>
<tr><td rowspan="2">SN</td><td colspan="3">Evaluation of Project Work End Examination</td></tr>
<tr><td>Description</td><td>Internal Examiner</td><td>External Examiner</td></tr>
<tr><td>1</td><td>Project Report</td><td>-</td><td>10 Marks</td></tr>
<tr><td>2</td><td>Project Presentation</td><td>05 Marks</td><td>15 Marks</td></tr>
<tr><td>3</td><td>Viva-Voce /Oral</td><td>05 Marks</td><td>15 Marks</td></tr>
<tr><td>4</td><td>Total</td><td>10 Marks</td><td>40 Marks</td></tr>
</table>
</td></tr>
<tr><td>7</td><td>Project Work (PW)

RP-II

6 Credit
150 Marks

CA: 50%
EE: 50%</td><td>1. Student is required to submit “Activity Report” based on Grading Criteria of the course in the prescribed format.
2. Maximum number of attempts for each CA, during each semester: Single attempt only
3. Marks: 75 Marks
4. Grading Criteria:
<table>
<tr><td>SN</td><td>Desc</td><td>Marks</td></tr>
<tr><td>1</td><td>Seminar*</td><td>30</td></tr>
<tr><td>2</td><td>Research Paper Presentation**</td><td>30</td></tr>
<tr><td>3</td><td>Project Report</td><td>15</td></tr>
</table>
*To be conducted in Online/Off line mode at LSC.
** Journals/Conferences/ at LSC, in Online/Offline mode [This activity shall be organized by respective LSC in Online/Offline mode in case student didn’t get an opportunity for presentation at Journals/Conferences]</td><td>1. External and internal examiners shall assess each student based on:
a. Project Report submission by the student (Only by External Examiner) [20 Marks]
b. Project Presentation by the student [25 Marks]
c. Viva-Voce on Project Report [30 Marks]
2. Number of attempts: Till Valid Registration Period (VRP) only
3. Marks: 75 Marks
4. Duration: 180 minutes</td></tr>
</table>

<table>
<tr><th>SN</th><th>Type of Course</th><th colspan="2">Continuous Assessment (CA)</th><th>End Examination (EE)</th></tr>
<tr><td></td><td></td><td colspan="3"><table>
<tr><td rowspan="2">SN</td><td colspan="3">Evaluation of Project Work End Examination</td></tr>
<tr><td>Description</td><td>Internal Examiner</td><td>External Examiner</td></tr>
<tr><td>1</td><td>Project Report</td><td>-</td><td>20 Marks</td></tr>
<tr><td>2</td><td>Project Presentation</td><td>05 Marks</td><td>20 Marks</td></tr>
<tr><td>3</td><td>Viva-Voce /Oral</td><td>10 Marks</td><td>20 Marks</td></tr>
<tr><td></td><td>Total</td><td>15 Marks</td><td>60 Marks</td></tr>
</table></td><td></td></tr>
</table>

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DEB-UGC application for Programme approval for AY 2023-24

School of Sciences, YCMOU Nashik

(Formerly School of Architecture, Science and Technology)

Programme Project Report (PPR)

M.Sc. (Mathematics)

Instructions:

1. The soft copy is forwarded on email of the directors of School .You are requested to prepare it in soft and submit in word and pdf format. The supporting document size in pdf should be below 5MB.
2. SLM in pdf to be submitted in pendrive to Director, CIQA on or before 28th Feb 2024.
3. All information need to be submitted on or before 28th Feb 2024.
4. If any other information required then it will be communicated to you time to time.

Programme: V151:M.Sc. (Mathematics) {2023 Pattern}

A. **Programme project report** (PPR)

Name of Program :		
a	Programme's mission & objectives	Programme's mission: Master of Science in Mathematics Programme has been designed to provide in-deep knowledge in Mathematics to those students who are not having opportunity to study in regular mode and for drop-out students from rural and urban areas. This programme is offered to meet current needs of aspiring youths and adult population and also create awareness about the basic Mathematical aspects to the society. This Programme aims at creating equity in education by providing opportunity to rural people for whom Higher Education is unreachable. This programme has the following broad objectives: • To prepare the learners, who will understand and apply the basic as well as advanced principles of mathematics for solving problems from science with an emphasis on applications • To produce the learners who are well-grounded in the fundamentals of Mathematics with the acquisition of the necessary skills, tools, and techniques required in many applications areas • To develop an ability to study the conceptual problem and critically analyze, and also promote the use of mathematics in industry and applied sciences • To provide exposure and motivate students for research in current trends of mathematics

b	Relevance of the program with HEI's Mission and Goals	Objects of the YCMOU (as per the YCMOU Act) which would be fulfilled by implementing the proposed program (a) To provide through instruction, teaching and training and other educational opportunities, access to larger and larger segment of population, and in particular to the disadvantaged groups such as those living in remote and rural areas including working people, housewives and other adults who wish to upgrade or acquire knowledge through studies in various fields; [1(a)] (b) To strengthen and diversify the degrees, diploma and certificate courses at various educational levels, to fulfil the knowledge, skills and development needs of the individuals, institutions and society in general, by relating, particularly, the courses, to the needs of the employment and economic development of the state on the basis of its natural and human resources; [1(b)] (c) To promote acquisition of knowledge in a rapidly developing and changing society and to continually offer opportunity of upgrading knowledge, training and skills in the context of innovations, research and discovery in all field of human endeavour by developing educational network with the use of modern communication media and technologies appropriate for a learning society; [1(c)] (d) To provide an innovative system of university level education, flexible and open, in regard to the methods and pace of learning, combination of courses, eligibility for enrolment, age of entry, conduct of examinations and operation of the program, with a review to promote learning and encourage excellence in all fields of knowledge; [1(d)] (e) To contribute to the improvement of the education system in the state by providing a non-formal channel complementary to the formal system and encouraging transfer of credits and exchange of teaching staff by making a wide use of text and other software developed by the University; [1(e)] (f) To develop innovative, need based Vocational courses and establish industry, institution linkage for developing the society; [1(f)] (g) To provide through incidental and non-formal means, for continuing and extension of education in various cultural forms, arts, crafts and skills of the country, raising their quality and improving their availability to the people; [1(g)] (h) To provide for the counselling and guidance to its students; [1(j)] (i) To provide major part of its resources and direct efforts in designing, developing and offering need-based and relevant vocational courses. [1(l)]
c	Nature of prospective target group of learners	In-Service Science Teachers from Schools/ Junior College and Equivalent pass students.

<table>
<tr><td></td><td></td><td>Admission Eligibility: Any B.Sc. with Maths upto Second year/ BA with Maths/ BE/ B.Tech. or equivalent pass
Although, similar PG Program on offer from the conventional institutes, conventional educational system offers very little freedom to learners as regards to when, where, how to learn. Proposed Program aims to provide this freedom to learners to the maximum possible extent.</td></tr>
<tr><td>d</td><td>Appropriateness of programme to be conducted in Open and Distance Learning mode to acquire specific skills and competence</td><td>Proposed Program aims to provide relevant skills as needed by the working professional to identify, and solve challenging problems in real life, thus contributing to the ever-increasing demands of the society/industry.
The program helps to develop scientific tempers and attitudes, which in turn can prove to be beneficial for the society since the scientific developments can make a nation or society to grow at a rapid pace.
After studying this program, students will be able to formulate mathematical models that represent real-world phenomena, analyse the models using mathematical methods, and interpret the results to make informed decisions or predictions.
This program uses the Open and Distance (ODL) Mode of Education- Theory, Practical/ Project component of teaching-learning is offered as face to face counseling by the qualified and experienced teacher at recognized Learner Support Centers along with continuous assessment and Self Learning Materials/ Resources in soft copy book format. Hence, this program is appropriate to conduct in Open and Distance Learning mode to acquire specified skills and competence.</td></tr>
<tr><td>e</td><td>Instructional Design
1. Curriculum Design (Outcome of Expert Committee meeting; Program Structure: specify the theory, practical, fieldwork, project, etc components):
2. Total Credit Points (including course wise):
3. Detailed Syllabi:
4. Duration of the program (Minimum & Maximum):
5. Medium of Instruction:
6. Type of Program (General/Technical/ Professional):
7. Faculty and Support Staff:
8. Instructional Design &</td><td>1. Curriculum Design and
2. Total Credit Points:
a. Total Courses: Total 23 courses (subjects) distributed over Semesters 01 to 04.
b. Total Credits: 88 Credits [As per UGC norms 1 Credit means 30 hours of study efforts required to gain learning of content of each credit].
c. Total Courses and Credit Distribution Scheme:
<table>
<tr><th rowspan="2">Sem</th><th colspan="3">Mandatory Courses(DSC)</th><th rowspan="2">Elective Courses (DSE) (4 Credits)</th><th rowspan="2">Other Courses (4 Credits)/ (6 Credits)</th><th rowspan="2">Total Courses (Credits)</th></tr>
<tr><th colspan="2">Theory</th><th>Practical (4 Credits)</th></tr>
<tr><td></td><td>(4 Credits)</td><td>(2 Credits)</td><td></td><td></td><td></td><td></td></tr>
<tr><td>1</td><td>2</td><td>1</td><td>1</td><td>1</td><td>1 – Research Methodology (4 Credits)</td><td>6 (22 Credits)</td></tr>
</table>
</td></tr>
</table>

Delivery Mechanism (***Media to be used - print, audio, video, online, computer aided, web based, etc. (course wise)***)**:**

9. Student Support Service System (***Specify the provisions to be made at Head Quarter, Regional Centers, Learner Support Centers and Web based, etc***)**:**

2	2	1	1	1	Any one - OJT/ Field Projects (4 Credits)	**6** (22 Credits)
3	2	1	1	1	1- Research Project (4 Credits)	**6** (22 Credits)
4	2	-	1	1	1- Research Project (6 Credits)	**5** (22 Credits)
Total	8 x4= (32 Credits)	3 x2= (6 Credits)	4x4= (16 Credits)	4x4= (16 Credits)	4x3+1x6= (18 Credits)	23 (88 Credits)

d. **Programme Structure:**

SN	Code	Course Name	CA	EE	TM	Type	CR	Min %
[Level 6.0]Semester 01: 22 Credits								
01	MAT501	Real Analysis	30	70	100	T	4	40%
02	MAT502	Abstract Algebra	30	70	100	T	4	40%
03	MAT503	Ordinary Differential Equations	15	35	50	T	2	40%
04	MAT504	Programming in C and Scilab	50	50	100	P	4	40%
05	RES505	Research Methodology	30	70	100	T	4	40%
Elective (DSE)Courses (Select Any One)								
06	MAT506	Operations Research	30	70	100	T	4	40%
07	MAT507	Numerical Analysis	30	70	100	T	4	40%
[Level 6.0]Semester 02: 22 Credits								
08	MAT509	Topology	30	70	100	T	4	40%
09	MAT510	Linear Algebra	30	70	100	T	4	40%
10	MAT511	Partial Differential Equations	15	35	50	T	2	40%
11	MAT512	LaTex and Programming in SageMath	50	50	100	P	4	40%
12	MAT513 MAT514	Any one OJT or FP OJT	50	50	100	TW	4	40%

		FP						
Elective (DSE)Courses (Select Any One)								
13	MAT515	Number Theory	30	70	100	T	4	40%
14	MAT516	Field Theory	30	70	100	T	4	40%
Exit option: PGD 9- MAT (44 Credits) after Three Year UG Degree								
[Level 6.5]Semester 03: 22 Credits								
15	MAT601	Complex Analysis	30	70	100	T	4	40%
16	MAT602	Measure and Integration	30	70	100	T	4	40%
17	MAT603	Integral Equations	15	35	50	T	2	40%
18	MAT604	Mathematical Statistics &Combinatorics	50	50	100	P	4	40%
19	MAT605	Research Project	50	50	100	PW	4	40%
Elective (DSE)Courses (Select Any One)								
20	MAT606	Discrete Mathematics	30	70	100	T	4	40%
21	MAT607	Differential Geometry	30	70	100	T	4	40%
22	MAT608	Integral Transforms	30	70	100	T	4	40%
[Level 6.5] Semester 04: 22 Credits								
23	MAT609	Classical Mechanics	30	70	100	T	4	40%
24	MAT610	Functional Analysis	30	70	100	T	4	40%
25	MAT611	Programming in Python	50	50	100	P	4	40%
26	MAT612	Research Project	75	75	150	PW	6	40%
Elective (DSE)Courses (Select Any One)								
27	MAT613	Cryptography	30	70	100	T	4	40%
28	MAT614	Topics in Fuzzy Mathematics	30	70	100	T	4	40%
29	MAT615	Algebraic Topology	30	70	100	T	4	40%

		3. Detailed Syllabi: Available at University website: **https://drive.google.com/drive/folders/13lNyj1PT7qN-AAAi2eE8fwDAsCQFWMQz?tid=0B451Yjwt_acQR1VPSUQ4Q0tvams** • Curriculum updation will be after every 3 years • Programme Outcomes and Course Outcomes: Refer Appendix - I **4. Duration of the program (*Minimum & Maximum*):** • **Minimum Programme Duration**: 2 years/ 4 semesters after any B.Sc. with Maths upto Second year/ BA with Maths/ BE/ B.Tech. or equivalent pass • **Maximum Programme Duration:** 4 years from the date of admission to the PG programme, also referred as Valid Registration Period. **5. Medium of Instruction:** English **6. Type of Program (*General/Technical/ Professional*):** General **7. Faculty and Support Staff:** Dr. Chetana Kamlaskar (Director, School of Sciences) and Ms. Tejaswi Kadam (Academic Coordinator) **8. Instructional Design & Delivery Mechanism:** a. **Teaching-Learning:** Total 12 + 3 = 15 working weeks in each semester, where 3-weeks' time duration in each semester for clearing face-to-face counseling session's backlog (if any). b. **Total Teaching-Learning Support:** Total 2640 Hours including Self-Study during all 4 semesters. 660 Hours (including Self-Study) **during** each semester. c. **Minimum number of face-to-face counseling sessions:** • For each course of 2 credits: 6 • For each course of 4 credits: 12 • For each course of 6 credits: 18 (For each theory type of course duration of each counseling session shall be 01 Clock Hour and For each Practical/Project type of course duration of each counseling session shall be 02 Clock Hour) d. **Attendance**: Minimum 80 % attendance recommended for all activity type of courses

<table>
<tr><td></td><td></td><td>e. Book: Book in SLM format for each course (Free Download from University website) at all semesters 01 to semester 04

9. Student Support Service System:

At headquarter: Support from School, SSD, Evaluation Division and Exam Unit-3

At Regional Centers: From all 8 regional centers within MH

At Learner Support Centers: Recognized Learner support centers within MH

Web Based: http://ycmou.digitaluniversity.ac http://ycmou.ac.in</td></tr>
<tr><td>f</td><td>Procedure for admissions, curriculum transaction and evaluation
1. Define the Admission Policy (including web based tools to be adopted:
2. Eligibility Criteria:
3. Fee Structure:
4. Financial Assistance to Learners (if any):
5. Activity planner of all academic activities of the academic session:
6. Policy for Evaluation of learner progress along with methods and tools:</td><td>1. Admission Policy: A customized “Online Annual Admission system” available at DU portal http://ycmou.digitaluniveristy.ac .

Online payment facility is made available using a credit card or debit card or internet banking.

2. Eligibility Criteria: Any B.Sc. with Maths upto Second year/ BA with Maths/ BE/ B.Tech. or equivalent pass

3. Fee Structure:
Annual Admission Form Amount (AAFA) is payable to university along with admission form at the start of each year.
<table>
<tr><th colspan="2">Description</th><th>INR ₹</th><th></th></tr>
<tr><td colspan="2"></td><td>1st yr</td><td>2nd yr</td></tr>
<tr><td colspan="2">Mandatory Fee (MF)</td><td>608</td><td>858</td></tr>
<tr><td rowspan="2">Tuition Fee</td><td>USF</td><td>6000</td><td>6000</td></tr>
<tr><td>LSCF</td><td>6000</td><td>6000</td></tr>
<tr><td colspan="2">End Exam Fee (EEF)</td><td>2000</td><td>2000</td></tr>
<tr><td colspan="2">Total (AAFA)</td><td>14,608</td><td>14,858</td></tr>
</table>
4. Financial Assistance to Learners (if any):NA

5. Activity planner:</td></tr>
</table>

SCHOOL OF SCIENCES PROGRAMME CALENDAR

Note: This University and School will follow the Programme Calender declared by UGC/DEB New Delhi time to time.

Teaching-Learning of students shall start from 01-September/01-Feb every year.

SN	Activity Description	Yearly Pattern/Odd semesters like 01, 03, 05 and 07 From 01-Sep Till 31-Jan	Even semesters like 02, 04, 06 and 08 From 01-Feb Till 31-Jul
Online Admission: offered on Annual basis for 2 semesters in each academic year. Only for 'C149: Certificate progarmme in Beekeeping', Admissions shall be offered on Winter and Summer batch basis.			
01	Fresh and Further Yearly Admission	From June/ July Till Aug (For C149,Winter Batch: From Jul)	NA (For C149, Summer Batch: From Jan)
Teaching – Learning at the resp Learning Support Centers/ SCs for all Theory, Practical, Term-Work, Studio & Project Courses			
02	Teaching – Learning (16 Weeks) & Backlog Clearing	**From 01-Sep Till 30-Nov**	**From 01-Feb Till 23-May**
Online End Exam (EE) Form Submission (Required only for Repeater Students)			
03	**Online** EE Form Submission by SCs/ students at University	On or Before 21-Oct	On or Before 23-Apr
Continuous Assessment (CA) Submission			
05	CA Availability	From 01-Sep Till 30-Nov	From 01-Mar Till 23-May
06	CA Submission by Students	From 01-Nov Till 30-Nov	From 01-May Till 31-May
End Examination (EE)			
07	**End Exam for Theory Courses**	**From 1-Dec to 10-Dec**	**From 25-May to 05-Jun**
08	EE for Activity Courses (Pr, TW, PW, STW, SV)	Immediately after/ before the schedule of the end exam for theory courses, but positively before 15-Dec	Immediately after/ before the schedule of the end exam for theory courses, but positively before 15-Jun
10	End Exam Result Declaration	On or Before 31-Jan	On or Before 31-Jul
Semester End Vacation			
11	Semester End Vacation	Jan	July

6. Evaluation Policy:

- **"Evaluation Pattern"**: As per NEP2020, the 'Evaluation Pattern' of the Post graduate Programme consists of the following components:

Course Type	No. of Credits	Continuous Assessment (CA)	End Examination (EE)	Total Marks 'TM' = (CA+EE)	Minimum Passing %
Theory (T)	4	30	70	100	minimum 40% in CA, EE and (CA + EE) shall be essential for each course to pass
Theory (T)	2	15	35	50	
Practical (P)	4	50	50	100	
OJT/Field Project	4	50	50	100	

(FP)					
Research Project (RP)	4	50	50	100	
Research Project (RP)	6	75	75	150	

- Separate and independent passing @ 40% in CA, EE and (CA+EE) shall be essential for each course - Theory, Practical, OJT/FP and RP."CA, EE and Total marks" shall be separately reported for each course in the transcript or mark-statement. The minimum and maximum marks for "CA, EE and Total Marks" are shown in the table below. If student does not score a minimum of 40% marks in CA or in EE of a course then the result of such a course will be reported as FAIL.

Course Type	**Number of Credits**	**Continuous Assessment (CA)**	**End Examination(EE)**			**Total Marks 'TM' = (CA +EE)**	
		Min	**Max**	**Min**	**Max**	**Min**	**Max**
Theory	2	6	15	14	35	20	50
	4	12	30	28	70	40	100
Practical/ OJT/FP/ RP	4	20	50	20	50	40	100
	6	30	75	30	75	60	150

- In each semester, only 1 attempt, for CA for each course and for EE for each course shall be allowed. Only during valid registration period (VRP), students are allowed to appear for CA and EE for each course against the payment of the specified 'Examination Fee' for each attempt, for each course where he/she is admitted by the university. The 'CA and/or EE' attempts are counted for each examination option offered by the university to the student, irrespective of whether student actually chooses to appear in end exam or not.
- If a student does not successfully complete the continuous assessment (CA) or pass the End Examination of Practical/Term work/OJT/Field Project/Research Project courses, they may complete these requirements with the next semester at the respective Learning Support Center (LSC) only during the valid registration period (VRP).
- Duration for Practical/Term work/OJT/Field Project/Research Project type of Courses: 180 Minutes for a batch of typically 15 ± 3 students
- Only best of past performance shall be reported in transcript or mark

		statement. • Total student evaluation for a. Each semester shall be for 550 marks b. Each year shall be for 1100 marks c. Each regular PG degree shall be for 2200 marks • Reporting Semesters for certification: Min 40% or better marks in total 23 courses (subjects) of total 88 credit points at Semesters 01-04. **Detail Evaluation Pattern is available at:** https://drive.google.com/drive/folders/1jtM1b-t_lO04apxNkfZCufdz3IPCkhnB?tid=0B451Yjwt_acQR1VPSUQ4Q0tvams Or **Refer Detail Evaluation pattern given in Appendix II.**
g	Requirement of the laboratory support and Library Resources	Laboratory requirement and Library Resources – Yes. Institutes/Colleges affiliated with conventional university offering M.Sc. (Mathematics) will be only recognized as a Learner support center of this university for this programme. So, requirement of laboratory support and library resources will be automatically ensured. **Recommended:** Computer infrastructure with Wi-Fi /broadband connection with Mathematics related software/tool.
h	Cost estimate of the programme and the provisions	A.27.P.38.Fees/ Royalty/ Honorarium to Writers/ Editors/ Trans
i	Quality assurance mechanism and expected programme outcomes	M.Sc. (Mathematics) programme is designed to provide scientific as well as professional level competency to learners, and offers advanced theoretical as well as practical knowledge to learners. This programme enables the learner to develop interest in knowing more about the Mathematics and to develop research attitude. University has policy to review and revise every course at least once in five years of its launching. The following key result areas will be closely monitored. i. Enrolment of student (Equated Access) ii. Equal weightage for each credit in student evaluation iii. Demonstrate in-depth knowledge of Mathematics, both in theory and practical iv. Examination Results v. Skill enhancement with valuable experiences through hands-on activities, projects and internships vi. Placements/satisfaction of passing out students vii. Administrative/stakeholder feedback

B. **Duration & Nomenclature**

Name of Programme :-	M.Sc. (Mathematics)
Medium	English
Year	2 Year
Level	PG
Academic Session	2023-24
Entry Qualification (as per the Specification of Degrees, 2014)	Any B.Sc. with Maths upto Second year/ BA with Maths/ BE/ B.Tech. or equivalent pass
Duration (as per the Specification of Degrees, 2014)	2 Year
Name of the Department	School of Sciences

C. **Mode of Evaluation**

Year	2023
Whether Weightages to continuous assessment and end semester examinations or term end examinations as per clause mentioned in Regulations	Yes 1. 30% - 70% weightage Pattern for theory 2. 50% - 50% Weightage pattern for Practical/OJT/FP/RP
Examination Scheme	Formative and Summative
Percentage of Continuous Assessment(%)	Theory: 30% Practical/OJT/FP/RP: 50%
Percentage of Term End Examination(%)	Theory: 70% Practical/OJT/FP/RP: 50%
Pass or Fail Criteria 40%	Yes
Pass/Fail Criteria (% Pass Marks)	40% and above - Pass Below 40 % - Fail

D. Mode of Examination

Whether examination through Online (For ODL Programs)	No

E. SLM Development (Submit all SLM in pdf in pendrive and prepare the SLM availability sheet in the order as per sample in pdf for each program separately)

Particulars	% SLM in house developed	% SLM in collaboration with with HEI(It should not be more than 40% of total SLM .If it is in collaboration then provide MOU in Soft & Hard copy
Printing Material	100 %	-
Audio-Video Material	-	-
Online Material	Yes [pdf of SLMs]	-
Compute based Material	-	-

F. Program wise faculty details (Requirement of Minimum three faculties not below the rank of Assistant Professor to be furnished in the following format: – to be taken from Establishment

Sr. No.	Emp. No	Name of the Faculty	Designation	Date of Joining	Qualification	Specialization	Teaching experience	Address	Phone no	Email	Appointment letter
1	0907	Ms. Tejaswi Kadam	Academic Coordinator	12/10/2018	M.Sc. Mathematics, SET	Mathematics	5 Year	Nashik	9527359061	tejaswikadamindia@gmail.com	
2											
3											

G. List of Learner Support Centres Program wise and Region wise to be submitted as per following format. (We have intimated the same to Director SSD. **You are requested to give him the list of programs for which the LSCs data is required.**) – To be taken from SSD Director

Sr. No	Study centre code	Name & Address of LSC	Name of the HEI to which college/Institute is affiliated (where LSC is established)	Whether the College /Institute Private or Govt. (where LSC is established)	Name and Contact Details of Coordinator/ counsellor :	Qualification of Coordinator/ Counsellor :	No. of Counsellor :	Name of Proposed Programmes/ Course from July, 2023 onwards:	Approved	Not Approved with Reason

Appendix - I

Programme Objectives, Scope of the Programme & Programme Outcomes (PO)

And Course Outcomes (CO)

<table>
<tr><td colspan="3">Programme Name: Master of Science (Mathematics)</td></tr>
<tr><td>1</td><td>Programme Objectives</td><td>This programme has the following broad objectives:
To prepare the learners, who will understand and apply the basic as well as advanced principles of mathematics for solving problems from science with an emphasis on applications
To produce the learners who are well-grounded in the fundamentals of Mathematics with the acquisition of the necessary skills, tools, and techniques required in many applications areas
To develop an ability to study the conceptual problem and critically analyze, and also promote the use of mathematics in industry and applied sciences
To provide exposure and motivate students for research in current trends of mathematics</td></tr>
<tr><td>2</td><td>Scope of the Programme</td><td>After successful completion of the M.Sc. programme, the learner has ample opportunities to use their mathematical knowledge in different areas:
Career opportunities in government organizations like Defense Research and Development Organization (DRDO), Indian Space Research Organization (ISRO), research laboratories like Council of Scientific and Industrial Research or government-owned scientific organizations.
Job positions like Mathematics Specialist, Quantitative Risk Analyst, Treasury Management Specialist, Public sector banking, financial institutions, Engineering or Insurance Sectors, etc.
Job opportunities in the teaching profession at Science and Engineering colleges, and Universities
Scope for Higher Studies and find lucrative opportunities in the field of research.</td></tr>
<tr><td>3</td><td>Programme Outcome</td><td>After successful completion of this programme, students will be able to
Enhance their logical thinking and apply advanced mathematical concepts to solve complex problems.
Formulate research questions, design experiments or investigations, collect and analyse data, and present their findings in a clear and coherent manner.
Apply advanced mathematical techniques and tools to analyse and solve challenging problems encountered in mathematics and related fields.
Formulate mathematical models that represent real-world phenomena, analyse the models using mathematical methods, and interpret the results to make informed decisions or predictions.
Develop proficiency in utilizing computational tools, software, and programming languages to aid in mathematical analysis, numerical simulations, and data visualization.
Present complex mathematical concepts, proofs, and research findings to both technical and non-technical audiences.
Develop a strong foundation for professional growth and lifelong learning in mathematics.</td></tr>
<tr><td>4</td><td>Course Outcomes</td><td><table><tr><th>SN</th><th>Course Code & Name</th><th>Course Outcomes</th></tr><tr><td colspan="3">Semester 1</td></tr></table></td></tr>
</table>

		1	MAT501: Real Analysis	After successful completion of this course, student should be able to • Comprehend the aspect of Metric Space which forms foundation for topology • Understand thorough foundation of Riemann integration theory • Use convergence of sequence and series of functions to evaluate Riemann integration of functions
		2	MAT502:Abstract Algebra	After successful completion of this course, student should be able to • Build foundation of group and ring theory • Apply the concept of subgroup and normal subgroups to discuss the solvability of groups and thereby solvability of equations of any positive order • Generalize the concepts of divisibility to rings and apply them in general context and factorize polynomials.
		3	MAT503: Ordinary Differential Equations	After successful completion of this course, student will be able to • Understand various methods of solutions of differential equations of first and second order. • Apply these methods to solve differential equations in physics and engineering fields • Discuss approximation and existence & uniqueness of solution of nth order differential equations to solve them using the techniques discussed thereby.
		4	MAT504:Programming in C and Scilab	After successful completion of this course, student will be able to • Use numerical methods in solving problems in Maths, Physics, Chemistry and any other areas using C. • Perform various Matrix Operations using C. • Write, compile and debug programs in Scilab. • Understand and solve matrices operations effectively using Scilab • Use conditional expressions and looping statement to solve problems associated with conditions and repetitions • Solve problems by using various numerical methods in Scilab
		5	RES505: Research Methodology	After successful completion of this course, student will be able to • Understand some basic concepts of research and its methodologies. • Select proper method of Data collection & representation • Select and apply appropriate statistical method for data analysis. • Perform literature review, research writings with the knowledge of Intellectual Property Rights.
		6	MAT506: Operations	After successful completion of this course, student should be

			Research	able to • Understand the theory of convex sets, functions, formulation of LPP, techniques of integer and non-integer solution of Linear and nonlinear programming problems. • Use quantitative methods and techniques for effective decisions– making • Develop model formulation and applications that are used in solving business decision problems.
		7	MAT507: Numerical Analysis	After successful completion of this course, student should be able to • Find solutions of algebraic or transcendental equations using an appropriate numerical method • Solve linear systems of equations using an appropriate numerical method • Apply the techniques of numerical methods to solve ordinary differential equations.
		Semester 2		
		8	MAT509: Topology	After successful completion of this course, student should be able to • Understand the basic concepts of topology and base for the topology • Discuss continuity of functions in topological spaces • Apply countability axioms for discussion of compactness, connectedness and sequential continuity of functions.
		9	MAT510: Linear Algebra	After successful completion of this course, student should be able to • Develop concepts of vector spaces and modules • Solve problems based on Linear transformations and Characteristic roots • Construct matrices in Nilpotent, Jordan and Rational forms which are useful for solving system of equations • Visualize theadjoint, self-adjoint and normal linear trans formations
		10	MAT511: Partial Differential Equations	After successful completion of this course, student should be able to • Solve the first-order linear and non-linear partial differential equations by using Lagrange's and Charpit'smethods respectively. • Understand concepts, methods of Solutions and applications of Partial Differential equations.
		11	MAT512:LaTex and Programming in SageMath	After successful completion of this course, student should be able to • Write a simple LaTeX input document based on the article class • Turn the input document into pdf with the pdflatex program • Format Words, Lines, and Paragraphs

				• Understand how to present data using tables • Typeset mathematical formulas, use nested list, tabular and array environments. • Import figures and pictures that are stored in external files.
		12	MAT513: OJT	After successful completion of this course, student should be able to – • Students will demonstrate proficiency in applying theoretical knowledge and academic concepts to real-world professional situations. • Students will possess job-specific skills that are relevant to their chosen field of study, enabling them to perform tasks and responsibilities effectively and efficiently. • Students will acquire a comprehensive understanding of industry practices, trends, and challenges, contributing to their overall knowledge and expertise in the field. • Students will establish professional networks and relationships, expanding their professional connections and opportunities for future collaborations and career advancement. • Students will develop problem-solving and critical thinking abilities, demonstrating the ability to analyze complex situations, make informed decisions, and propose effective solutions. • Students will demonstrate professionalism, adaptability, and effective communication skills in a professional work environment.
		13	MAT514:FP	After successful completion of this course, student should be able to – • Demonstrate the ability to apply theoretical knowledge and concepts to real-world situations, effectively bridging the gap between academia and practical applications. • Develop advanced research and investigative skills, including the ability to design and execute research projects, collect and analyze data, and draw well-founded conclusions. • Conduct independent research, demonstrating the ability to formulate research questions, design appropriate methodologies, and independently execute fieldwork or data collection. • Exhibit effective collaboration and communication skills, demonstrating the ability to work collaboratively with others, engage in professional dialogue, and effectively communicate their research findings to diverse audiences. • Showcase advanced problem-solving and critical thinking abilities, demonstrating the capacity to identify and address challenges encountered during fieldwork, analyze complex data, and

				propose innovative solutions. • Demonstrate a thorough understanding of ethical considerations, field safety protocols, and best practices in their chosen field of study.
		14	MAT515: Number Theory	After successful completion of this course, student should be able to • Understand the concept of arithmetical functions • Solve problems based on congruences and quadratic residues • Know the concepts of primitive root theory
		15	MAT516: Field Theory	After successful completion of this course, student should be able to • Understand concepts in field theory such as finite and algebraic extensions, algebraic elements, constructible elements, solvable groups etc • Aware the motive behind development of galois theory and solvability by radicals • Apply concepts in field theory for solving polynomial equations, systems of equations, ancient problems on impossibility of constructions and finding formula for solutions of polynomial equations.
		Semester 3		
		16	MAT601:Complex Analysis	After successful completion of this course, student should be able to • Understand the concepts of analytic functions, harmonic functions and the importance of the Cauchy Riemann equations. • Apply analyticity solve integration of functions • Describe the basic properties of singularities, zeros residues, poles to solve integrals. • Apply concept of Hadamard Theorem and Uniqueness of Direct Analytic Continuation along a Curve, Power Series Method of Analytic Continuation
		17	MAT602: Measure and Integration Theory	After successful completion of this course, student should be able to • Develop fundamentals of measurable sets and functions • Apply the concept of measurability of function and sets to solve integration of functions. • Discuss L^p spaces in more general setting and use them to prove Riesz theorem.
		18	MAT603:Integral Equations	After successful completion of this course, student should be able to • Classify and solve integral equations • Apply integral equations to solve ODEs
		19	MAT604: Mathematical Statistics & Combinatorics	After successful completion of this course, student should be able to • Use various graphical and diagrammatic techniques of data representation • Analyse data pertaining to discrete and continuous variables and to interpret

				the results • Compute various measures of central tendency, dispersion, skewness and kurtosis • Summarize and analyze the data using computer • Find the probabilities of events • Apply standard probability distributions to different situations
		20	MAT605: Research Project - I	After successful completion of this course, student should be able to • Frame research problem & do literature survey about the same • Do independent thinking • Learn basic techniques for carrying out research
		21	MAT606: Discrete Mathematics	After successful completion of this course, student should be able to • Solve problems on permutation and combinations, discrete Probability • Understand concepts of graph theory, Trees, Cut-sets • Understand properties of Boolean algebra, lattice and Boolean functions, Algebraic Systems defined by Lattices
		22	MAT607: Differential Geometry	After successful completion of this course, student should be able to • Describe curves and surfaces and label their equations • Represent the curves and surfaces in different forms and identify their nature • Construct various surfaces • Compute various parameters related to curves and surfaces and justify their behaviour
		23	MAT608: Integral Transforms	After successful completion of this course, student should be able to • Solve problems on differential and integral equations using Laplace, Fourier transform techniques • Solve difference Equations by using Z transforms • Solve problems based on Mellin Transform and Hankel transform techniques
		Semester 4		
		24	MAT609: Classical Mechanics	After successful completion of this course, student should be able to • Use Euler's variational principles to solve real life problems. • Apply D'Alembert's Principle, Lagrange's equation, Hamiltonians Principle, Hamilton's equation and Hamilton Jacobi equation to form differential equation as well as its solution of various real existing systems. • Formulate Poisson's brackets, Lagrange's bracket, and canonical transformation for solution of equations.

		25	MAT610:Functional Analysis	After successful completion of this course, student should be able to • Know the concepts of normed spaces, Banach space and Hilbert spaces • Explain how the notion of norm induces metric on a linear space and then think of sequences, continuity and completeness over linear spaces • Apply uniform boundedness principal, Hahn-Banach theorem for solution of differential equations
		26	MAT611: Programming in Python	After successful completion of this course, student should be able to • Explain basic principles of Python programming language • Implement object oriented concepts • Demonstrate the use of Python in Mathematics such as operations research and computational Geometry etc. • Study graphics and design and implement a program to solve a real world problem • Implement the concepts of data with python and database connectivity
		27	MAT612: Research Project	After successful completion of this course, student should be able to • Frame research problem & do literature survey about the same • Do independent thinking • Learn basic techniques for carrying out research
		28	MAT613: Cryptography	After successful completion of this course, student should be able to • Use various primarily tests, encryption and decryption algorithms • Apply arithmetic of elliptic curves in cryptography • Use ways of doing secret communication
		29	MAT614:Topics in Fuzzy Mathematics	After successful completion of this course, student should be able to • Apply the concepts of fuzzy sets, algebra of fuzzy sets and extension principal. • Explain generalize notions of fuzzy union, intersection and fuzzy complementation and their properties. • Apply fuzzy relations, fuzzy arithmetic's, fuzzy relation equations and fuzzy logic for real life problems.
		30	MAT615:Algebraic Topology	After successful completion of this course, student should be able to • Explain the fundamental concepts of algebraic topology and their role in modern mathematics and applied contexts. • Explain the well-known theorems- The Euler-Poincare theorem, Euler's theorem,

				Brouwer's fixed point theorem. • Learn the relation between first homology group and fundamental group. • Apply problem-solving using algebraic topology techniques applied to diverse situations in physics, engineering and other mathematical contexts.

Appendix II

Evaluation Pattern

SN	Type of Course	Continuous Assessment (CA)	End Examination (EE)
1	Theory (T) 4 Credit 100 Marks CA: 30% EE: 70%	Each student is required to attempt total 02 (Two) "Continuous Assessments (CAs)" for each course of each Semester, as per the following details: 1. CA01: 'Continuous Assessment 01 (CA01)' on Credit 01 to Credit 04 of each course, consists of • 2 (Two) 'Short Answer Questions (SAQs)',each carrying 05 Marks, on Credit 01 and Credit 02 **and** • 1 (One) 'Long Answer Question (LAQ)' of 10 Marks, on Credit 03 and Credit 04. LAQ may consist of sub-questions. **CA01**: On Credit 01 to Credit 04, of Marks = (5x2 + 10) = **20 Marks** 2. CA02: 'Continuous Assessment 02 (CA02)' on Credit 01 to Credit 04 of each course, consists of • A test containing total **10** (Ten) 'Objective Type Questions, ' 05 (Five) on Credit 01 and Credit 02,and 05 (Five) on Credit 03 and Credit 04. Each 'Objective Type Question' of 1 Mark. **CA02**: On Credit 01 to Credit 04, of Marks = **10 Marks** 3. Maximum number of attempts for **CA,** during each semester : Single attempt only 4. **Total Marks**: **30** Marks	1. Student is required to answer **05 'VSAQs' out of 06 'VSAQs'**, each carrying 03 Marks, on Credit 01 to 04, for total 15 Marks. One VSAQ will be on each Credit. 2. Student is required to answer **05 'SAQs' out of 06 'SAQs'**, each carrying 05 Marks, on Credit 01 to 04, for total 25 Marks. One SAQ will be on each Credit. 3. Student is required to answer **01 'LAQ' out of 2 LAQs,** of 10 Marks on Credit 01 and Credit 02, for total 10 Marks. LAQ may consist of sub-questions. 4. Student is required to answer **01 'LAQ' out of 2 LAQs,** of 10 Marks on Credit 03 and Credit 04, for total 10 Marks. LAQ may consist of sub-questions. 5. Student is required to answer **01 'LAQ' out of 2 LAQs,** of 10 Marks on Credit 01 to Credit 04, for total 10 Marks. LAQ may consist of sub-questions. 6. Number of attempts: Till Valid Registration Period (VRP) only 7. Marks: 70 Marks 8. Duration: 150 minutes

<table>
<tr><th>SN</th><th>Type of Course</th><th colspan="2">Continuous Assessment (CA)</th><th colspan="2">End Examination (EE)</th></tr>
<tr><td></td><td></td><td colspan="4"><table>
<tr><th>SN</th><th>Description</th><th>Evaluation of End Examination(EE)</th><th>Marks</th></tr>
<tr><td rowspan="3">1</td><td rowspan="3">Question Types</td><td>Very Short Answer Question (VSAQ) on each Credit</td><td>03 Marks</td></tr>
<tr><td>Short Answer Question (SAQ) on each Credit</td><td>05 Marks</td></tr>
<tr><td>On each Credit, either Single Long Answer Question (LAQ) or LAQ contains sub-questions (a), (b) and so on.</td><td>10 Marks</td></tr>
<tr><td>2</td><td>Grand Total Marks</td><td>Total five Questions in EE Question paper based on:
Credit 01 to 04 : 05 VSAQs out of 06 VSAQs (15 Marks)
Credit 01 to 04 : 05 SAQs out of 06 SAQs (25 Marks)
Credit 01 to 02 : 01 LAQ out of 02 LAQs (10 Marks)
Credit 03 to 04 : 01 LAQ out of 02 LAQs (10 Marks)
Credit 01 to 04 : 01 LAQ out of 02 LAQs (10 Marks)
LAQ may contains sub-questions</td><td>70 Marks</td></tr>
</table></td></tr>
<tr><td>2</td><td>Theory (T)
2 Credit
50 Marks

CA: 30%
EE: 70%</td><td colspan="2">Each student is required to attempt total 01 (One) “Continuous Assessment (CA)” for each course of each Semester, as per the following details:
1. CA01: 1 (One) ‘Continuous Assessment 01 (CA01)’ on Credit 01 and Credit 02 of each course, consists of
• 1 (One) ‘Short Answer Question (SAQ)’ of 5 Marks
and
• 1 (One) ‘Long Answer Question (LAQ)’of 10 Marks, LAQ may consist of sub-questions.
CA01: On Credit 01 and Credit 02, of Marks = (5 + 10) = 15 Marks
2. Maximum number of attempts for CA, during each semester: Single attempt only
3. Total Marks: 15 Marks</td><td colspan="2">1. Student is required to answer 05 ‘VSAQs’ out of 06 ‘VSAQs’, each carrying 03 Marks, on Credit 01 to 02, for total 15 Marks. One VSAQ will be on each Credit.
2. Student is required to answer 02 ‘SAQs’ out of 03 ‘SAQs’, each carrying 05 Marks, on Credit 01 to 02, for total 10 Marks. One SAQ will be on each Credit.
3. Student is required to answer 01 ‘LAQ’ out of 2 LAQs, of 10 Marks on Credit 01 and Credit 02, for total 10 Marks. LAQ may consist of sub-questions.
4. Number of attempts: Till Valid Registration Period (VRP) only
5. Marks: 35 Marks
6. Duration: 75 minutes</td></tr>
</table>

<table>
<tr><th>SN</th><th>Type of Course</th><th colspan="3">Continuous Assessment (CA)</th><th>End Examination (EE)</th></tr>
<tr><td rowspan="5"></td><td rowspan="5"></td><td>SN</td><td>Description</td><td colspan="2">Evaluation of End Examination (EE)</td><td>Marks</td></tr>
<tr><td rowspan="3">1</td><td rowspan="3">Question Types</td><td colspan="2">Very Short Answer Question (VSAQ) on each Credit</td><td>03 Marks</td></tr>
<tr><td colspan="2">Short Answer Question (SAQ) on each Credit</td><td>05 Marks</td></tr>
<tr><td colspan="2">On each Credit, either Single Long Answer Question (LAQ) or LAQ contains sub-questions (a), (b) and so on.</td><td>10 Marks</td></tr>
<tr><td>2</td><td>Grand Total Marks</td><td colspan="2">Total three Questions in EE Question paper based on:
Credit 01 to 02 : 05 VSAQs out of 06 VSAQs (15 Marks)
Credit 01 to 02 : 02 SAQs out of 03 SAQs (10 Marks)
Credit 01 to 02 : 01 LAQ out of 02 LAQs (10 Marks)
LAQ may contains sub-questions</td><td>35 Marks</td></tr>
</table>

<table>
<tr><th>SN</th><th>Type of Course</th><th>Continuous Assessment (CA)</th><th>End Examination (EE)</th></tr>
<tr><td>3</td><td>Practical (P)

4 Credit
100 Marks

CA: 50%
EE: 50%</td><td>1. Student is required to submit “Activity Report in Work-Book Format” for each Credit in the prescribed format.
2. Maximum number of attempts for each CA, during each semester : Single attempt only
3. Marks: 50 Marks
4. Grading criteria:
<table>
<tr><td>Lab Punctuality, Preparedness & Ethics</td><td>Irregular in lab. Copies the experiment from others
(0 Points)</td><td>Consistently regular but unable to explain the concepts
(06 Points)</td><td>Punctuality in lab. Follows the procedure and responds to questions asked
(10 Points)</td></tr>
<tr><td>Activity Report and Performance

(Experiment No, Date, Objectives, Apparatus with specification, Observations, Graphs, software used if any)</td><td>Poor Documentation and copied the experiment from others.
Couldn't perform the Activity /poor observation made
(04 Points)</td><td>Average Documentation: Report is in format but some of the formatting guidelines are missed.
Performed the Activity but observations made with some mistakes
(12 Points)</td><td>Good Documentation: Lab activity writing is in proper format with all references, Grammar.
Performed the Activity on time observations made with no mistakes
(20 Points)</td></tr>
<tr><td>Results and Conclusion</td><td>Unable to achieve the desired results but makes attempts to relate data to theory. Poor concluding statements
(08 Points)</td><td>Average graphical and tabulated representation with misinterpret physical significance of theory. Achieve the desired results and but insufficient conclusion statement.
(14 Points)</td><td>Analyses and interpret observed data carefully with good graphical and tabulated representation using appropriate theory/evidence. Achieve the results and reach to appropriate Conclusion
(20 Points)</td></tr>
</table>
</td><td>External and internal examiners shall assess each student based on:
1. Workbook/Activity Report submission by the student (Only by External Examiner) [05 Marks]
2. Practical Activity performed by the student [12 Marks]
3. Result and Conclusion of the Practical Activity [13 Marks]
4. Viva-Voce on Practical Activities [20 Marks]
5. Number of attempts: Till Valid Registration Period (VRP) only
6. Marks: 50 Marks
7. Duration: 180 minutes</td></tr>
</table>

SN	Evaluation of Practical End Examination		
	Description	Internal Examiner	External Examiner
1	Workbook/Activity Report	-	05 Marks
2	Actual Conduct of one randomly selected Practical Activity	02 Marks	10 Marks
3	Diagram, Synoptic Answers, Graph/Observation and Conclusion	03 Marks	10 Marks
4	Viva-Voce/Oral	05 Marks	15 Marks
5	Total	10 Marks	40 Marks

<table>
<tr><th>SN</th><th>Type of Course</th><th>Continuous Assessment (CA)</th><th>End Examination (EE)</th></tr>
<tr><td>4</td><td>Field Project (TW)

4 Credit
100 Marks

CA: 50%
EE: 50%</td><td>Students need to complete one month Field Project (Total Study hours 120 hrs including Activity Report). After completion of the field project, learners shall submit a report to the LSC - Programme Coordinator (PC) and Mentor/Guide.
1. Maximum number of attempts for each CA, during each semester: Single attempt only
2. Duration: 1 Month or 4 Weeks duration –i) After end examination of semester 02 and before beginning of semester 03 or
ii) Any one month during semester 02 duration
3. Marks: 50 Marks
4. Grading Criteria for Evaluation of FP (only by Mentor/Guide):
<table>
<tr><th>SN</th><th>Description</th><th>Marks</th></tr>
<tr><td>1</td><td>Key Definitions of Problem area and analysis of preliminary data</td><td>15</td></tr>
<tr><td>2</td><td>Work related to formats, Correspondence, Interactions and liaising etc</td><td>05</td></tr>
<tr><td>3</td><td>Field work and data collection</td><td>15</td></tr>
<tr><td>4</td><td>Analysis and Report</td><td>10</td></tr>
<tr><td>5</td><td>Feedback to community</td><td>05</td></tr>
<tr><td colspan="2">Total</td><td>50</td></tr>
</table></td><td>1. External and Internal examiners (Internal examiner - Programme Coordinator (PC) / Supervisor of LSC) shall assess each student based on:
a. Activity Report submission by the student (Only by External Examiner) [10 Marks]
b. Viva-Voce on Activity Report [40 Marks]
2. Number of attempts: Till Valid Registration Period (VRP) only
3. Marks: 50 Marks
4. Duration: 180 minutes</td></tr>
<tr><td colspan="4">
<table>
<tr><th rowspan="2">SN</th><th colspan="3">Evaluation of Field Project End Examination</th></tr>
<tr><th>Description</th><th>Internal Examiner
(Programme Coordinator
(PC)/ Supervisor of LSC)</th><th>External Examiner</th></tr>
<tr><td>1</td><td>Workbook/Report submission</td><td>-</td><td>10 Marks</td></tr>
<tr><td>2</td><td>Viva-Voce /Oral</td><td>10 Marks</td><td>30 Marks</td></tr>
<tr><td>3</td><td>Total</td><td>10 Marks</td><td>40 Marks</td></tr>
</table>
</td></tr>
</table>

<table>
<tr><th>SN</th><th>Type of Course</th><th>Continuous Assessment (CA)</th><th>End Examination (EE)</th></tr>
<tr><td>5</td><td>OJT or Internship (TW)

4 Credit
100 Marks

CA: 50%
EE: 50%</td><td>
1. Students need to complete one month On Job Training (OJT) or Internship (Total Study hours 120 hrs including Internship Report) in any Industry/Organization/Institute/ R&D Division /Any Micro/Small/Medium/ enterprise/Govt/NGO/PSU/Online Internship related to major course.
2. Maximum number of attempts for each CA, during each semester: Single attempt only
3. Marks: 50 Marks
4. Duration: 1 Month or 4 Weeks –
i) After end examination of semester 02 and before beginning of semester 03.
or
ii) Any one month during semester 02 duration
5. Grading Criteria for Evaluation of OJT (or Intern) only by Mentor where the Internship is proposed to be imparted:
<table>
<tr><th>SN</th><th>Parameters</th><th>Marks Out of</th></tr>
<tr><td>1</td><td>Behaviors, Shows interest in assigned work, Willingness to learn</td><td>10</td></tr>
<tr><td>2</td><td>Accepts responsibility, Cooperates with co-workers and supervisors, Demonstrates organizational skills</td><td>10</td></tr>
<tr><td>3</td><td>Uses time, knowledge and expertise effectively, Analyzes problems effectively</td><td>10</td></tr>
<tr><td>4</td><td>Demonstrates creativity/ originality / any innovative contribution, Professional ethics and accountability</td><td>10</td></tr>
<tr><td>5</td><td>Writes effectively, Produces high quality work/Skill Proficiency</td><td>10</td></tr>
<tr><td colspan="2">Total</td><td>50</td></tr>
</table>
Document as Evidence: Activity report along with Certificate or Declaration, duly issued and signed by the concerned authority [To be assessed during EE] should be submitted during End Examination to the parent Learner support Centre (LSC).
</td><td>
At the end of second semester, Programme Coordinator (PC)/ Supervisor of LSC and 1 (one) External Examiner will complete ‘End Exam (EE)’ for all allotted students as follows:
1. Duration of EE: After Theory EE of second Semester
2. Programme Coordinator (PC)/ Supervisor of LSC and External Expert will have 20% and 80% weightage respectively in EE.
3. Number of attempts: Till Valid Registration Period (VRP) only
4. Marks for EE: 50 Marks
<table>
<tr><th>Parameter</th><th>PC /Supervisor of LSC</th><th>External Expert</th></tr>
<tr><td>Professional Attitude</td><td>-</td><td>05 Marks</td></tr>
<tr><td>Maintenance of Daily Diary</td><td>-</td><td>10 Marks</td></tr>
<tr><td>Internship Report</td><td>05 Marks</td><td>10 Marks</td></tr>
<tr><td>Viva/Oral</td><td>05 Marks</td><td>15 Marks</td></tr>
<tr><td>Total</td><td>10 Marks</td><td>40 Marks</td></tr>
</table>
</td></tr>
</table>

<table>
<tr><th>SN</th><th>Type of Course</th><th>Continuous Assessment (CA)</th><th>End Examination (EE)</th></tr>
<tr><td>6</td><td>Project Work (PW)

RP-I
4 Credit
100 Marks

CA: 50%
EE: 50%</td><td>1. Student is required to submit “Activity Report” based on Grading Criteria of the course in the prescribed format.
2. Maximum number of attempts for each CA, during each semester: Single attempt only
3. Marks: 50Marks
4. Grading Criteria:
<table><tr><td>SN</td><td>Desc</td><td>Marks</td></tr><tr><td>1</td><td>Seminar*</td><td>25</td></tr><tr><td>2</td><td>Research Proposal</td><td>25</td></tr></table>*To be conducted in Online/Offline mode at LSC.</td><td>1. External and internal examiners shall assess each student based on:
a. Project Report submission by the student (Only by External Examiner) [10 Marks]
b. Project Presentation by the student [20 Marks]
c. Viva-Voce on Project Report [20 Marks]
2. Number of attempts: Till Valid Registration Period (VRP) only
3. Marks: 50 Marks
4. Duration: 180 minutes</td></tr>
<tr><td colspan="3"><table><tr><td rowspan="2">SN</td><td colspan="3">Evaluation of Project Work End Examination</td></tr><tr><td>Description</td><td>Internal Examiner</td><td>External Examiner</td></tr><tr><td>1</td><td>Project Report</td><td>-</td><td>10 Marks</td></tr><tr><td>2</td><td>Project Presentation</td><td>05 Marks</td><td>15 Marks</td></tr><tr><td>3</td><td>Viva-Voce /Oral</td><td>05 Marks</td><td>15 Marks</td></tr><tr><td>4</td><td>Total</td><td>10 Marks</td><td>40 Marks</td></tr></table></td></tr>
<tr><td>7</td><td>Project Work (PW)

RP-II

6 Credit
150 Marks

CA: 50%
EE: 50%</td><td>1. Student is required to submit “Activity Report” based on Grading Criteria of the course in the prescribed format.
2. Maximum number of attempts for each CA, during each semester: Single attempt only
3. Marks: 75 Marks
4. Grading Criteria:
<table><tr><td>SN</td><td>Desc</td><td>Marks</td></tr><tr><td>1</td><td>Seminar*</td><td>30</td></tr><tr><td>2</td><td>Research Paper Presentation**</td><td>30</td></tr><tr><td>3</td><td>Project Report</td><td>15</td></tr></table>*To be conducted in Online/Off line mode at LSC.
** Journals/Conferences/ at LSC, in Online/Offline mode [This activity shall be organized by respective LSC in Online/Offline mode in case student didn’t get an opportunity for presentation at Journals/Conferences]</td><td>1. External and internal examiners shall assess each student based on:
a. Project Report submission by the student (Only by External Examiner) [20 Marks]
b. Project Presentation by the student [25 Marks]
c. Viva-Voce on Project Report [30 Marks]
2. Number of attempts: Till Valid Registration Period (VRP) only
3. Marks: 75 Marks
4. Duration: 180 minutes</td></tr>
</table>

<table>
<tr><th>SN</th><th>Type of Course</th><th colspan="2">Continuous Assessment (CA)</th><th>End Examination (EE)</th></tr>
<tr><td></td><td></td><td colspan="3"><table>
<tr><td rowspan="2">SN</td><td colspan="3">Evaluation of Project Work End Examination</td></tr>
<tr><td>Description</td><td>Internal Examiner</td><td>External Examiner</td></tr>
<tr><td>1</td><td>Project Report</td><td>-</td><td>20 Marks</td></tr>
<tr><td>2</td><td>Project Presentation</td><td>05 Marks</td><td>20 Marks</td></tr>
<tr><td>3</td><td>Viva-Voce /Oral</td><td>10 Marks</td><td>20 Marks</td></tr>
<tr><td></td><td>Total</td><td>15 Marks</td><td>60 Marks</td></tr>
</table></td><td></td></tr>
</table>

End Of Doc

DEB-UGC application for Programme approval for AY 2023-24

School of Sciences, YCMOU Nashik

(Formerly School of Architecture, Science and Technology)

Programme Project Report (PPR)

M.Sc. (Botany)

A. **Programme project report** (PPR)

Name of Program :		
a	Programme's mission & objectives	**Mission**: The 'M.Sc. (Botany)' Program aims to create awareness about Botany, analyze various vital Botanical issues and find creative solutions for the same, to inculcate values, entrepreneurship and research attitude in learners. **Objectives**: The objectives of this course are 1. Develop Advanced Knowledge: The primary objective of the postgraduate program in Botany Studies is to provide students with advanced knowledge and a deeper understanding of various aspects of Botany, ecology, Mycology, Plant Diversity and Pathology. 2. Interdisciplinary Perspective: The program aims to foster an interdisciplinary perspective, enabling students to integrate knowledge from various disciplines, including biology, chemistry, geology, economics, and social sciences, to address complex Botanical issues. 3. Critical Thinking and Research Skills: The program seeks to cultivate critical thinking and research skills in students, encouraging them to analyze environmental problems, conduct empirical research, and apply data-driven approaches to find sustainable solutions. 4. Botanical Policy and Governance: Students will gain insights into Botanical policy frameworks, laws, and governance mechanisms to evaluate the effectiveness of Botanical regulations and contribute to policy formulation. 5. Sustainable Development: The program aims to equip students with the tools to promote sustainable development, considering the social, economic, and ecological dimensions of Botanical challenges. 6. Botanical Awareness and Ethics: Enhance Botanical awareness and ethical values among students, emphasizing their responsibility as future Botanical professionals to protect and preserve the natural world.
b	Relevance of the program with HEI's Mission and Goals	Objects of the YCMOU (as per the YCMOU Act) which would be fulfilled by implementing the proposed program 1. To provide through instruction, teaching and training and other educational opportunities, access to larger and larger segment of population, and in particular to the disadvantaged groups such as those living in remote and rural areas including working people, housewives and other adults who wish to upgrade or acquire knowledge through studies in various fields; [1(a)] 2. To strengthen and diversify the degrees, diploma and certificate courses at various educational levels, to fulfil the knowledge, skills and development needs of the

		individuals, institutions and society in general, by relating, particularly, the courses, to the needs of the employment and economic development of the state on the basis of its natural and human resources; [1(b)] 3. To promote acquisition of knowledge in a rapidly developing and changing society and to continually offer opportunity of upgrading knowledge, training and skills in the context of innovations, research and discovery in all field of human endeavour by developing educational network with the use of modern communication media and technologies appropriate for a learning society; [1(c)] 4. To provide an innovative system of University level education, flexible and open, in regard to the methods and pace of learning, combination of courses, eligibility for enrolment, age of entry, conduct of examinations and operation of the program, with a review to promote learning and encourage excellence in all fields of knowledge; [1(d)] 5. To contribute to the improvement of the education system in the state by providing a non-formal channel complementary to the formal system and encouraging transfer of credits and exchange of teaching staff by making a wide use of text and other software developed by the University; [1(e)] 6. To develop innovative, need based Vocational courses and establish industry, institution linkage for developing the society; [1(f)] 7. To provide through incidental and non-formal means, for continuing and extension of education in various cultural forms, arts, crafts and skills of the country, raising their quality and improving their availability to the people; [1(g)] 8. To provide for the counseling and guidance to its students; [1(h)] 9. To provide major part of its resources and direct efforts in designing, developing and offering need-based and relevant vocational courses. [1(i)]
c	Nature of prospective target group of learners	Candidates with B.Sc. (BCZ) /B.Sc. with Botany at FY and SY or Equivalent pass. Although, similar PG Program on offer from the conventional institutes, conventional educational system offers very little freedom to learners as regards to when, where, how to learn. Proposed Program aims to provide this freedom to learners to the maximum possible extent.
d	Appropriateness of programme to be conducted in Open and Distance Learning mode to acquire specific skills and competence Specify the expected learning outcomes in terms of: 1. Knowledge Attainment: 2. Skills and Competencies: Compliances of academic,	Proposed Program aims to provide relevant skills as needed by the working professional to identify, and solve challenging problems in Botany, thus contributing to the ever increasing demands of the society/industry. The program helps to develop scientific tempers and attitudes, which in turn can prove to be beneficial for the society since the scientific developments can make a nation or society to grow at a rapid pace. (After studying this program, students will be more equipped to learn and know about different biological systems, their coordination and control as well as evolution, behavior and biological roles of the animals in the ecosystem). This program uses the Open and Distance(ODL) Mode of Education- Theory, Practical/ Project component of teaching-

	professional & occupational standards:	learning is offered as face to face counseling by the qualified and experienced teacher at recognized LSC along with continuous assessment and offline materials/ resources in printed/ Soft Copy/ book format. Hence, this program is appropriate to conduct in Open and Distance Learning mode to acquire specified skills and competence.
e	Instructional Design Instructional Design : **1.** Curriculum Design (Outcome of Expert Committee meeting; Program Structure: specify the theory, practical, fieldwork, project, etc components): **2.** Total Credit Points (including course wise): **3.** Detailed Syllabi: **4.** Duration of the program (Minimum & Maximum): **5.** Medium of Instruction: **6.** Type of Program (General/Technical/ Professional): **7.** Faculty and Support Staff: **8.** Instructional Design & Delivery Mechanism (Media to be used - print, audio, video, online, computer aided, web based, etc. (course wise)): Student Support Service System (Specify the provisions to be made at Head Quarter, Regional Centers, Learner Support Centers and Web based, etc):	**Semester pattern:** This programme is of total 4 semesters. Distribution of the credits are as follows –

Sem	Mandatory Courses (DSC)			Elective Courses (DSE) (4 CR)	Other Courses 4 CR/ 6 CR	Total Courses (CR)
	Theory		Practical 4 CR			
	4 CR	2 CR				
1	2	1	1	1	1 – Research Methodology (4 CR)	**6** (22 CR)
2	2	1	1	1	Any one - OJT/ Field Projects (4 CR)	**6** (22 CR)
3	2	1	1	1	1- Research Project (4 CR)	**6** (22 CR)
4	2	-	1	1	1- Research Project (6 CR)	**5** (22 CR)
Total	8 x 4 = 32	3 x 2 = 06	4 x 4 = (16 CR)	4 x 4 = (16 CR)	3 x 4 + 1 x 6 = (18 CR)	**23** (88 CR)
	(38 CR)					

Programme Structure:

SN	Course Category	Code	Course Name	CA	EE	TM	Type	CR	Min %
[Level 6.0] Semester 01: 22 Credits									
01	Mandatory (DSC)	BOT501	Diversity of Non-vascular Plants-I	30	70	100	T	4	40%
02	Mandatory (DSC)	BOT502	Diversity of Non-Vascular Plants-II	30	70	100	T	4	40%
03	Mandatory (DSC)	BOT503	Diversity of Vascular Plants & Paleobotany-I	15	35	100	T	2	40%
04	Mandatory (DSC)	BOT504	Lab Activities on BOT501, BOT502 & BOT503	50	50	50	P	4	40%
05	RM	RES505	Research Methodology	30	70	100	T	4	40%
Elective (DSE)Courses (Select Any One)									
06	Elective (DSE)	BOT506	Applied Phycology	30	70	100	T	4	40%
07	Elective	BOT507	Tools and Techniques in	30	70	100	T	4	40%

	(DSE)		plant Science							
[Level 6.0] Semester 02 : 22 Credits										
08	Mandatory (DSC)	BOT509	Plant Physiology	30	70	100	T	4	40%
09	Mandatory (DSC)	BOT510	Herbal Wealth	30	70	100	T	4	40%
10	Mandatory (DSC)	BOT511	Diversity of Vascular Plants and Paleobotany-II	15	35	100	T	2	40%
11	Mandatory (DSC)	BOT512	Lab Activities on BOT509, BOT510 & BOT511	50	50	50	P	4	40%
12	OJT/FP	BOT513 BOT514	Any one OJT or FP	50	50	100	TW	4	40%
Elective (DSE)Courses (Select Any One)										
13	Elective (DSE)	BOT515	Biotechnology and Molecular Biology	30	70	100	T	4	40%
14	Elective (DSE)	BOT516	Ecology and Phytogeography	30	70	100	T	4	40%
Exit option: PGD 14- BOT (44 Credits) after Three Year UG Degree										
[Level 6.5] Semester 03 : 22 Credits										
15	Mandatory (DSC)	BOT601	Cytogenetics and Plant Breeding	30	70	100	T	4	40%
16	Mandatory (DSC)	BOT602	Advanced Plant Physiology	30	70	100	T	4	40%
17	Mandatory (DSC)	BOT603	Pharmacognosy	15	35	100	T	2	40%
18	Mandatory (DSC)	BOT604	Lab Activities on BOT601, BOT602 & BOT603	50	50	50	P	4	40%
19	RP	BOT605	Research Project	50	50	100	PW	4	40%
Elective (DSE)Courses (Select Any One)										
20	Elective (DSE)	BOT606	Biostatistics	30	70	100	T	4	40%
21	Elective (DSE)	BOT607	Mycology and Plant Pathology	30	70	100	T	4	40%
22	Elective	BOT608	Renewable Energy Studies	30	70	100	T	4	40%

	(DSE)								
[Level 6.5] Semester 04 : 22 Credits									
23	Mandatory (DSC)	BOT609	Taxonomy of Angiosperms	30	70	100	T	4	40%
24	Mandatory (DSC)	BOT610	Seed Technology	30	70	100	T	4	40%
25	Mandatory (DSC)	BOT611	Lab Activities on BOT609 & BOT610	30	70	100	T	4	40%
26	RP	BOT612	Research Project	75	75	150	PW	6	40%
Elective (DSE)Courses (Select Any One)									
27	Elective (DSE)	BOT613	Anatomy and Embryology	30	70	100	T	4	40%
28	Elective (DSE)	BOT614	Hydroponic Technology	30	70	100	T	4	40%
29	Elective (DSE)	BOT615	Medicinal plants and their Applications	30	70	100	T	4	40%

Total Credits: 88 and Total Courses: 29 (with electives)
Detailed Syllabi: Available at https://drive.google.com/drive/folders/13lNyj1PT7qN-AAAi2eE8fwDAsCQFWMQz?tid=0B451Yjwt_acQR1VPSUQ4Q0tvams

- **Programme Outcomes (PO) and Course Outcomes (CO): Refer Appendix I**

Minimum programme duration: 2 years
Maximum Programme Duration: 4 years
Medium of Instruction: English
Type of Program: General
Faculty and Support Staff: Dr. Chetana Kamlaskar, Director, School of Sciences, Dr. Bharat P. More (Academic coordinator), Ms. Minakshi Babusing Kadel (Academic coordinator),, Dr. Jagruti Chavan (Academic coordinator),, School of Sciences.

Instructional Design & Delivery Mechanism :

- Minimum number of face-to-face counseling sessions: 12 (for 4 Credits)
- (For each theory type of course of 4 credits duration of each counseling session shall be 01 Clock Hour)
- (For each Practical/Project type of course of 4 credits duration of each counseling session shall be 02 Clock Hour).
- Minimum number of face-to-face counseling sessions: 6 (for 2 Credits)

		• (For each theory type of course of 2 credits duration of each counseling session shall be 01 Clock Hour) • Minimum number of face-to-face counseling sessions: 18 (for 6 Credits) • (For each Practical/Project type of course of 6 credits duration of each counseling session shall be 02 Clock Hour). • Required study efforts: Total 2640 Hours (including Self-Study) during all 4 semesters. • Attendance: Minimum 80 % attendance recommended for all activity type of courses • eBook: eBook in SLM format for each course (Free Download from University website) at all semesters 01 to semester 04 **Student Support Service System**: At headquarter: Support from School, SSD, Evaluation Division and Exam Unit-3 At Regional Centers: From all 8 regional centers within MH At Learner Support Centers: Recognized Learner support centers within MH Web Based: http://ycmou.digitaluniversity.ac http://www.ycmou.ac.in
f	Procedure for admissions, curriculum transaction and evaluation 1. Define the Admission Policy (including web based tools to be adopted: 2. Eligibility Criteria: 3. Fee Structure: 4. Financial Assistance to Learners (if any): 5. Activity planner of all academic activities of the academic session: Policy for Evaluation of learner progress along with methods and tools:	**Admissions procedure**: A customized "Online Annual Admission system" available at DU portal http://ycmou.digitaluniveristy.ac Online payment facility is made available using a credit card or debit card or internet banking. **Admission Eligibility:** B.Sc.(BCZ) /B.Sc. with Botany at FY and SY or Equivalent pass Total programme Fee: Total ₹ 46,316 for all 04 Semesters, which is duly approved by the university authorities. Curriculum Transaction: • 01 SLM e-Book will be developed for each theory course • Total 12 Face-To-Face counseling sessions, each of 60 Minutes duration, will be provided at respective learner support center, for each theory course. • Total 12 Face-To-Face counseling sessions, each of 120 Minutes duration, will be provided at respective learner support center, for each practical course. • Curriculum updation will be after every 3 years **Activity planner:**

		Teaching-Learning of students admitted in a single academic year shall start from 01-Sep. every year. (For all Programmes) **Policy:** Refer Evaluation pattern given in Annexure I. **For exit option**: PGD 14-BOT: Min 40% or better marks in total 12 courses without electives & 14 courses with electives (subjects) of total 44 credits at Semesters 01 to 02.
g	Requirement of the Laboratory Support and Library Resources: 1. Laboratory Support to the learners (if any): 2. Provision of Practical book for learners (if any): 3. Provision of Virtual Reality Methods for Practical in case of Online learning (if any):	Laboratory requirement and Library Resources – Yes. Institutes/Colleges affiliated with conventional university offering M.Sc. (Botany) will be only recognized as a Learner support center of this university for this programme. So, requirement of laboratory support and library resources will be automatically ensured. Recommended: Computer infrastructure with Wi-Fi/broadband connection with Botany related software/tool.
h	Cost Estimate of the Program and the Provisions: 1. Indicate the Budgetary Requirement for: 1.Programme Development 2. Program Delivery 3. Program Maintenance	Budget provision for this development under A.27P.38Fees/ Royalties/ honorarium to Writer/Editors/Trans.

SN	Activity Description	Odd semesters like 01, 03, 05 and 07 From 01-Sep Till 31-Jan	Even semesters like 02, 04, 06 and 08 From 01-Feb Till 31-Jul
Admission: offered on Annual basis collectively for 2 semesters in each academic year.			
01	Fresh and Further Yearly Admission	From June Till Aug	NA
Teaching - Learning			
02	Teaching – Learning (16 Weeks) & Backlog Clearing	From 01-Aug Till 21-Nov	From 01-Feb Till 23-May
End Exam (EE) Form Submission (Required only for Repeater Students)			
03	Online EE Form Submission by SCs/ students at University	On or Before 21-Oct	On or Before 23-Apr
Continuous Assessment (CA) Submission			
05	CA Availability	From 01-Sep Till 21-Nov	From 01-Mar Till 23-May
06	CA Submission by Students	From 01-Nov Till 30-Nov	From 01-May Till 31-May
End Examination (EE)			
07	End Exam for Theory Courses	From 25-Nov to 05-Dec	From 25-May to 05-Jun
08	EE for Activity Courses (Pr, TW, PW, STW, SV)	Immediately after the last day of end exam for theory courses, but positively before 15-Dec	Immediately after the last day of end exam for theory courses, but positively before 15-Jun
10	End Exam Result Declaration	On or Before 31-Jan	On or Before 31-Jul
Semester End Vacation			
11	Semester End Vacation	Jan	July

i	Quality Assurance Mechanism and expected Program Outcomes*: 1. Define the Review Mechanism of the Program for enhancing the standards of curriculum, instructional design relevant to professional requirements: 2. Define Program Benchmark Statements: 3. Mechanism for Monitoring the effectiveness of the program: *(Minimum standards must adhere to UGC (ODL) Regulations,2020 & directions of the Statutory Bodies of the University)	M.Sc. (Botany) programme is designed to provide scientific as well as professional level competency to learners, and offers advanced theoretical as well as practical knowledge to learners. This programme enables the learner to develop interest in knowing more about the environment and to develop research attitude. University has policy to review and revise every course at least once in five years of its launching. The following key result areas will be closely monitored. i. Enrolment of student (Equated Access) ii. Equal weightage for each credit in student evaluation iii. Demonstrate in-depth knowledge of Botany, both in theory and practical iv. Examination Results v. Placements/satisfaction of passing out students vi. Administrative/stakeholder feedback

B. **Duration & Nomenclature**

Name of Programme :-	M.Sc. in Botany
Medium	English
Year	2 Years
Level	PG
Academic Session	2023-24
Entry Qualification (as per the Specification of Degrees, 2014)	B.Sc.(BCZ) /B.Sc. with Botany at FY and SY or Equivalent pass
Duration (as per the Specification of Degrees, 2014)	2 Years
Name of the Department	School of Sciences

C. **Mode of Evaluation**

Year	2023	
Whether Weightages to continuous assessment and end semester examinations or term end examinations as per clause mentioned in Regulations	Yes 1. 30% - 70% weightage Pattern for theory 2. 50% - 50% Weightage pattern for Practical/OJT/FP/RP	
Examination Scheme	Formative and Summative	
Percentage of Continuous Assessment (%)	Theory	30%
	Practical/OJT/FP/RP	50%
Percentage of Term End Examination (%)	Theory	70%
	Practical/OJT/FP/RP	50%
Pass or Fail Criteria	40% for Pass	
Pass/Fail Criteria (% Pass Marks)	40% and above - Pass	

	Below 40 % - Fail

D. Mode of Examination

Whether examination through Online (For ODL Programs)	No

E. SLM Development (Submit all SLM in pdf in pen drive and prepare the SLM availability sheet in the order as per sample in pdf for each program separately)

Particulars	% SLM in house developed	% SLM in collaboration with HEI (It should not be more than 40% of total SLM .If it is in collaboration then provide MOU in Soft & Hard copy
Printing Material	100%	-
Audio-Video Material	-	-
Online Material	Yes [pdf of SLMs]	-
Compute based Material	-	-

F. Program wise faculty details (Requirement of Minimum three faculties not below the rank of Assistant Professor to be furnished in the following format – to be taken from Establishment

Sr. No.	Emp. No	Name of the Faculty	Designation	Date of Joining	Qualification	Specialization	Teaching experience	Address	Phone no.	Email	Appointment letter
1	0939	Ms. Minakshi Babusing Kadel	Academic Coordinator	13/03/2024	M.Sc. Botany, SET (Life Sciences), SET (Environmental Sciences)	Botany	2 years	YCMOU	8888694739	sos.botany@ycmou.ac.in	04/03/2024
2	1067	Dr. Jagruti Chavan	Academic Coordinator	11/03/2024	M.Sc. , SET, Ph.D (Environmental Sciences)	Environmental Sciences	9 years	YCMOU	8554894494	sos.evs@ycmou.ac.in	04/03/2024
3		Dr. Bharat Pralhad More	Academic Coordinator	13/01/2020	M.Sc. Chemistry, Ph.D.	Organic Chemistry	16 Years	YCMOU	9175456300	bhrtmre@gmail.com	13/01/2020

G. List of Learner Support Centres Program wise and Region wise to be submitted as per following format – to be taken from SSD Director

Sr. No	Study centre code	Name & Address of LSC	Name of the HEI to which college/Institute is affiliated (where LSC is established)	Whether the College /Institute Private or Govt. (where LSC is established)	Name and Contact Details of Coordinator/ counsellor :	Qualification of Coordinator/ Counsellor :	No. of Counsellor :	Name of Proposed Programmes/ Course from July, 2023 onwards:	Approved	Not Approved with Reason

Appendix I

Programme Objectives, Scope of the Programme & Programme Outcomes (PO)

And

Course Outcomes (CO)

Programme Name: Master of Science (BOTANY)		
1	**Programme Objectives**	This programme has the following broad objectives: • To prepare the learners, with the necessary theoretical knowledge and practical skills to conduct independent research in botany. This includes training in research methodologies, experimental design, data analysis, and interpretation. • To produce the learners who are proficient in various aspects of botany, including plant anatomy, physiology, taxonomy, ecology, genetics, and evolution. Graduates should be equipped to apply their knowledge in diverse settings such as academia, industry, government, and conservation organizations. • To **Develop critical thinking and problem-solving abilities**: Through coursework, laboratory exercises, fieldwork, and research projects, students should develop critical thinking skills and the ability to solve complex problems in botany. This involves the application of scientific principles to analyze and address issues related to plant biology, ecology, conservation, and sustainability. • To provide students with the necessary theoretical knowledge and practical skills to conduct independent research in botany. This includes training in research methodologies, experimental design, data analysis, and interpretation.
2	**Scope of the Programme**	After successful completion of the M.Sc. programme, the learner has ample opportunities to use their Botany knowledge in different areas: **Career Opportunities**: • Advancement to leadership positions in research institutions, government agencies, or corporations. • Entrepreneurship opportunities in agriculture, biotechnology, eco-tourism, or botanical product development. • Consulting opportunities in environmental impact assessment, land use planning, or sustainable development projects. • Collaboration with interdisciplinary teams in areas such as climate change adaptation, ecosystem restoration, or biodiversity conservation. **Job Positions**: • Research Scientist • Laboratory Manager • Environmental Policy Analyst • Seed Analyst • Plant Geneticist

		• Ecologist • Park Ranger • Plant Breeder • Botanical Illustrator **Job Opportunities**: • Botanist: Conduct research in laboratories, botanical gardens, or field settings, studying plant life, ecology, and evolution. • Plant Biotechnologist: Work in biotechnology companies, agricultural organizations, or research institutions to develop genetically modified crops, improve crop yields, or enhance plant resistance to pests and diseases. • Environmental Consultant: Assess the impact of human activities on plant biodiversity and ecosystems, and provide recommendations for conservation and sustainable land management practices. • Conservation Scientist: Work for government agencies, non-profit organizations, or environmental consulting firms to develop and implement strategies for the protection and restoration of plant species and habitats. • Educator: Teach botany and related subjects at colleges, universities, botanical gardens, museums, or outreach programs. • Agronomist: Provide expertise in crop production, soil management, and sustainable agriculture practices to enhance food security and agricultural sustainability. • Forester: Manage forest ecosystems, conduct research on tree species, and develop strategies for forest conservation and sustainable timber harvesting. • Horticulturist: Cultivate and manage plants in botanical gardens, nurseries, landscaping firms, or agricultural production facilities. • Plant Pathologist: Identify and control plant diseases, conduct research on plant-pathogen interactions, and develop strategies for disease management in agriculture and horticulture **Scope for Higher Studies**: • Doctoral (Ph.D.) studies in Botany, Plant Biology, Ecology, Genetics, Biotechnology, or related fields. • Postdoctoral research positions for further specialization and career advancement. • Professional certifications or additional training in specialized areas such as plant breeding, GIS mapping, or environmental law and policy.
3	**Programme Outcome**	After successful completion of this programme, students will be able to • Enhance their understanding of advanced concepts and principles in botany, including plant physiology, ecology, genetics, taxonomy, and biotechnology. • Formulate research questions, design experiments or investigations, collect and analyse data, and present their findings in a clear and coherent manner. • Applying Techniques and Methodologies acquire proficiency in a variety of laboratory techniques, field methodologies, and analytical tools used in botanical research and practice. • Formulate testable hypotheses based on theoretical frameworks and empirical evidence, contributing to the advancement of knowledge in botany.

<table>
<tr><td></td><td></td><td>

Develop the ability to effectively communicate complex scientific information through written reports, oral presentations, and visual aids, catering to diverse audiences including peers, policymakers, and the general public.
Present complex botanical concepts, proofs, and research findings to both technical and non-technical audiences.
Develop the skills to analyze complex botanical problems, identify key challenges, and propose innovative solutions informed by scientific evidence and critical thinking.

</td></tr>
<tr><td>4</td><td>Course Outcomes</td><td>
<table>
<tr><th>SN</th><th>Course Code & Name</th><th>Course Outcomes</th></tr>
<tr><td colspan="3">Semester 1</td></tr>
<tr><td>1</td><td>BOT501: Diversity of Non-vascular Plants-I</td><td>After successful completion of this course, student should be able to
Identify and describe the different types of nonvascular plants.
Explain the key features of nonvascular plants and their life cycles.
Discuss the ecological importance of nonvascular plants.
Understand the application of Diversity of Non-vascular Plants .
Apply their knowledge of nonvascular plants to real- world problems, such as conservation and restoration.</td></tr>
<tr><td>2</td><td>BOT502: Diversity of Non-Vascular Plants-II</td><td>After successful completion of this course, student should be able to
Discuss the ecological importance of nonvascular plants.
Understand the application of Diversity of Non-vascular Plants.
Explain the key features of nonvascular plants and their life cycles.
Evaluate the potential of nonvascular plants as biofertilizers and bioagents.</td></tr>
<tr><td>3</td><td>BOT503: Diversity of Vascular Plants & Paleobotany-I</td><td>After successful completion of this course, student will be able to
The student will be able to identify the major groups of vascular plants, both living and extinct, with 80% accuracy.
The student will be able to explain the evolutionary relationships between the major groups of vascular plants.</td></tr>
</table>
</td></tr>
</table>

					• The student will be able to use paleobotanical data to reconstruct the history of the Earth's climate and environment. • The student will be able to write a research paper on a topic related to the diversity of vascular plants.
			4	BOT504: Lab Activities on BOT501, BOT502 & BOT503	After successful completion of this course, student will be able to • Identify the major groups of non-vascular plants, both living and extinct, with 80% accuracy. • Explain the evolutionary relationships between the major groups of non-vascular plants. • Use non-vascular plant data to reconstruct the history of the Earth's climate and environment. • Write a research paper on a topic related to the diversity of non-vascular plants.
			5	RES505: Research Methodology	After successful completion of this course, student will be able to • Understand some basic concepts of research and its methodologies. • Select proper method of Data collection & representation • Select and apply appropriate statistical method for data analysis. • Perform literature review, research writings with the knowledge of Intellectual Property Rights.
			6	BOT506: Applied Phycology	After successful completion of this course, student should be able to • Identify and classify different groups of algae, including their morphological and anatomical characteristics. • Understand the ecological roles and contributions of algae in various ecosystems and their importance in the food chain. • Analyze the physiological processes of algae, including photosynthesis and reproduction, and relate them to broader botanical principles. • Evaluate the impact of algae on the environment, including harmful algal blooms and their management strategies. • Apply phycological knowledge in the field of agriculture, including algae-based fertilizers, biofertilizers, and soil health improvement.

		7	BOT507: Tools and Techniques in plant Science	After successful completion of this course, student should be able to • Understand the basic tools and techniques used in plant science, such as microscopes, cell culture techniques, and genetic engineering. • Apply these tools and techniques to the study of plants, such as the identification of plant cells, the culture of plant cells, and the transformation of plant cells with genes. • Communicate effectively about tools and techniques in plant science through written reports, presentations, and other media.
		Semester 2		
		8	BOT509 Plant Physiology	After successful completion of this course, student should be able to • Explain the role of plant hormones in growth regulation, development, and responses to environmental cues. • Understand the mechanisms of water and mineral transport in plants and their significance in maintaining plant health and homeostasis. • Analyze the factors influencing plant growth, including light, temperature, humidity, and nutrient availability. • Investigate the responses of plants to abiotic and biotic stress factors, such as drought, salinity, pathogens, and herbivores. • Evaluate the impact of environmental factors on crop productivity and explore strategies for improving crop yield and stress tolerance.
		9	BOT510: Herbal Wealth	After successful completion of this course, student should be able to • Describe the traditional and contemporary uses of herbs in different cultures for medicinal, culinary, cosmetic, and aromatic purposes. • Understand the chemical constituents and active compounds present in medicinal herbs and their potential therapeutic benefits. • Evaluate the scientific evidence supporting the medicinal properties and efficacy of herbal remedies. • Discuss the importance of herbal wealth in the context of traditional medicine systems, such as Ayurveda, Traditional Chinese Medicine, and Indigenous knowledge.

					• Analyze the ecological significance of herbal resources and their conservation in the context of sustainable practices and biodiversity conservation.
			10	BOT511: Diversity of Vascular Plants and Paleobotany-II	After successful completion of this course, student should be able to • The student will be able to identify the major groups of vascular plants, both living and extinct, with 80% accuracy. • The student will be able to explain the evolutionary relationships between the major groups of vascular plants. • The student will be able to use paleobotanical data to reconstruct the history of the Earth's climate and environment. • The student will be able to write a research paper on a topic related to the diversity of vascular plants.
			11	BOT512: Lab Activities on BOT509, BOT510 & BOT511	After successful completion of this course, student should be able to • Identify medicinal plants by their common and scientific names. • Describe the chemical constituents of medicinal plants and their effects on humans. • Discuss the traditional and modern uses of medicinal plants. • Evaluate the safety and efficacy of medicinal plants. • Collect and prepare herbarium specimens. • Conduct field studies of medicinal plants. • Apply ethical principles to the study and use of medicinal plants.
			12	BOT513: OJT	After successful completion of this course, student should be able to – • Students will demonstrate proficiency in applying theoretical knowledge and academic concepts to real-world professional situations. • Students will possess job-specific skills that are relevant to their chosen field of study, enabling them to perform tasks and responsibilities effectively and efficiently. • Students will acquire a comprehensive understanding of industry practices, trends, and challenges, contributing to their overall

					knowledge and expertise in the field. • Students will establish professional networks and relationships, expanding their professional connections and opportunities for future collaborations and career advancement. • Students will develop problem-solving and critical thinking abilities, demonstrating the ability to analyze complex situations, make informed decisions, and propose effective solutions. • Students will demonstrate professionalism, adaptability, and effective communication skills in a professional work environment.
			13	BOT514:FP	After successful completion of this course, student should be able to – • Demonstrate the ability to apply theoretical knowledge and concepts to real-world situations, effectively bridging the gap between academia and practical applications. • Develop advanced research and investigative skills, including the ability to design and execute research projects, collect and analyze data, and draw well-founded conclusions. • Conduct independent research, demonstrating the ability to formulate research questions, design appropriate methodologies, and independently execute fieldwork or data collection. • Exhibit effective collaboration and communication skills, demonstrating the ability to work collaboratively with others, engage in professional dialogue, and effectively communicate their research findings to diverse audiences. • Showcase advanced problem-solving and critical thinking abilities, demonstrating the capacity to identify and address challenges encountered during fieldwork, analyze complex data, and propose innovative solutions. • Demonstrate a thorough understanding of ethical considerations, field safety protocols, and best practices in their chosen field of study.
			14	BOT515: Biotechnology and Molecular Biology	After successful completion of this course, student should be able to • Define the terms "biotechnology", "molecular biology", and explain their relationship to each other. • Understand the basic principles of biotechnology and molecular biology, such as DNA cloning, gene

				expression, and protein synthesis. • Apply these principles to the study of plants, such as the development of new cultivars, the improvement of crop yields, and the development of new drugs. • Communicate effectively about biotechnology and molecular biology through written reports, presentations, and other media.
		15	BOT516: Ecology and Phytogeography	After successful completion of this course, student should be able to • Understand the basic principles of ecology and phytogeography, such as the distribution of plants, the interactions between plants and their environment, and the effects of human activities on plant communities. • Apply these principles to the study of plant communities, such as the identification of plant communities, the study of the factors that influence the distribution of plants, and the assessment of the impact of human activities on plant communities. • Communicate effectively about ecology and phytogeography through written reports, presentations, and other media.
		Semester 3		
		16	BOT601: Cytogenetics and Plant Breeding	After successful completion of this course, student should be able to • Identify and interpret chromosomal abnormalities in plant cells. • Apply cytogenetics to plant breeding by selecting parents with desirable traits and using various breeding methods. • Design and execute breeding experiments using proper techniques. • Evaluate the results of breeding experiments and draw conclusions about the effectiveness of the breeding methods used.
		17	BOT602: Advanced Plant Physiology	After successful completion of this course, student should be able to • Describe the basic principles of plant physiology, such as photosynthesis, respiration, transpiration, and the role of hormones in plant growth and development. • Apply these principles to the study of plant growth, development, and responses to the environment.

					• Conduct research on plant physiology using proper techniques and equipment. • Communicate effectively about plant physiology through written reports, presentations, and other media.
			18	BOT603: Pharmacognosy	After successful completion of this course, student should be able to • Identify and classify crude drugs by their common and scientific names. • Describe the chemistry of secondary metabolites, such as alkaloids, glycosides, and tannins. • Describe the methods of extraction, purification, and standardization of crude drugs. • Understand the pharmacology of crude drugs, such as their mechanisms of action and side effects. • Evaluate the safety and efficacy of herbal medicines.
			19	BOT604: Lab Activities on BOT601, BOT602 & BOT603	After successful completion of this course, student should be able to • Identify and interpret chromosomal abnormalities in plant cells. • Apply cytogenetics to plant breeding by selecting parents with desirable traits and using various breeding methods. • Design and execute breeding experiments using proper techniques. • Evaluate the results of breeding experiments and draw conclusions about the effectiveness of the breeding methods used. • Understand the basic principles of plant physiology, such as photosynthesis, respiration, transpiration, and the role of hormones in plant growth and development. • Apply these principles to the study of plant growth, development, and responses to the environment.
			20	BOT605: Research Project - I	After successful completion of this course, student should be able to • Frame research problem & do literature survey about the same • Do independent thinking • Learn basic techniques for carrying out research

		21	BOT606 Biostatistics	After successful completion of this course, student should be able to • Calculate basic statistical Majors, such as the mean, median, and standard deviation. • Use statistical software to analyze botanical data. • Interpret the results of statistical analyses. • Communicate the results of statistical analyses in a clear and concise manner.
		22	BOT607: Mycology and Plant Pathology	After successful completion of this course, student should be able to • Learning the structure, life cycles, economic importance etc of bacteria, virus, fungi and apply this knowledge in identification of organisms. • Analysis of diseases based on symptoms, and apply knowledge for identification of disease • Understanding and application of knowledge of fungal metabolites, their uses for human welfare. • Knowledge on the history, milestones in phytopathology of India • Learn host-parasite relationships, various diseases and control methods. • Practical knowledge on disease control measures in various crops. • Knowledge on bacterial, viral, mycorhizal and nematode diseases, symptoms and their importance.
		23	BOT608: Renewable Energy Studies	After successful completion of this course, student should be able to • Critically analyze and evaluate different renewable energy technologies and their suitability for specific contexts. • Capability of planning, designing, and managing renewable energy projects, considering technical, economic, and regulatory aspects. • Demonstrating an understanding of the environmental and social implications of renewable energy deployment and make informed decisions to minimize negative impacts. • Navigating energy policies and regulations and advocate for sustainable and renewable energy initiatives.
		Semester 4		
		24	BOT609:	After successful completion of this course, student should

				Taxonomy of Angiosperms	be able to • Identify and classify angiosperms by their common and scientific names. • Describe the morphological, anatomical, and molecular features of angiosperms. • Explain the evolutionary history of angiosperms. • Apply taxonomic principles to the study of angiosperms in the field and laboratory. • Communicate effectively about angiosperm taxonomy through written reports, presentations, and other media.
			25	BOT610: Seed Technology	After successful completion of this course, student should be able to • Define the terms "seed technology", "seed production", "seed processing", and "seed storage" and explain their relationship to each other. • Understand the basic principles of seed technology, such as the structure of seeds, the germination process, and the factors that affect seed quality. • Apply these principles to the production, processing, and storage of seeds, such as the selection of seed parents, the production of seedbeds, and the storage of seeds in a cool, dry environment. • Communicate effectively about seed technology through written reports, presentations, and other media.
			26	BOT611: Lab Activities on BOT609 & BOT610	After successful completion of this course, student should be able to • Identify a wide range of angiosperm taxa using morphological features such as leaf arrangement, flower structure, fruit type, and other diagnostic characteristics. • Classify plants into major taxonomic groups (e.g., families, genera, species) based on their morphological characteristics and evolutionary relationships. • Learn to use botanical nomenclature and terminology correctly and adhere to scientific standards of accuracy and clarity in their communication. • Develop critical thinking skills by evaluating conflicting taxonomic hypotheses, resolving taxonomic uncertainties, and synthesizing information from multiple sources to reach

					informed conclusions. • Apply their taxonomic knowledge and problem-solving skills to address real-world challenges in biodiversity conservation, plant ecology, agriculture, and other fields.
			27	BOT612: Research Project	After successful completion of this course, student should be able to • Frame research problem & do literature survey about the same • Do independent thinking • Learn basic techniques for carrying out research
			28	BOT613: Anatomy and Embryology	After successful completion of this course, student should be able to • Identify and classify various types of plant tissues (e.g., epidermal, ground, vascular) and understand their functions. • Understand the principles of plant embryogenesis, from the formation of the zygote to the development of seedlings. • Compare and contrast the embryonic development of different plant groups, including angiosperms and gymnosperms. • Analyze the factors influencing plant growth and development, including hormonal regulation and environmental cues. • Apply anatomical and embryological knowledge to solve practical problems in plant propagation, breeding, and horticulture.
			29	BOT614: Hydroponic Technology	After successful completion of this course, student should be able to • Understand the importance of water quality in hydroponics. • Identify the different types of grow lights and their applications. • Apply the principles of plant physiology to hydroponics. • Design and build a simple hydroponic system • Conduct a research project on a topic related to hydroponics.

		30	BOT615: Medicinal Plants and their Applications	After successful completion of this course, student should be able to • Identify medicinal plants by their common and scientific names. • Describe the chemical constituents of medicinal plants and their effects on humans. • Discuss the traditional and modern uses of medicinal plants. • Evaluate the safety and efficacy of medicinal plants. • Apply ethical principles to the study and use of medicinal plants.

Appendix II

Evaluation Pattern

SN	Type of Course	Continuous Assessment (CA)	End Examination (EE)
1	Theory (T) 4 Credit 100 Marks CA: 30% EE: 70%	Each student is required to attempt total 02 (Two) "Continuous Assessments (CAs)" for each course of each Semester, as per the following details: 1. CA01: 'Continuous Assessment 01 (CA01)' on Credit 01 to Credit 04 of each course, consists of • 2 (Two) 'Short Answer Questions (SAQs)',each carrying 05 Marks, on Credit 01 and Credit 02 **and** • 1 (One) 'Long Answer Question (LAQ)' of 10 Marks, on Credit 03 and Credit 04. LAQ may consist of sub-questions. **CA01**: On Credit 01 to Credit 04, of Marks = (5x2 + 10) = **20 Marks** 2. CA02: 'Continuous Assessment 02 (CA02)' on Credit 01 to Credit 04 of each course, consists of • A test containing total **10** (Ten) 'Objective Type Questions, ' 05 (Five) on Credit 01 and Credit 02,and 05 (Five) on Credit 03 and Credit 04. Each 'Objective Type Question' of 1 Mark. **CA02**: On Credit 01 to Credit 04, of Marks = **10 Marks** 3. Maximum number of attempts for **CA,** during each semester : Single attempt only 4. **Total Marks**: **30** Marks	1. Student is required to answer **05 'VSAQs' out of 06 'VSAQs'**, each carrying 03 Marks, on Credit 01 to 04, for total 15 Marks. One VSAQ will be on each Credit. 2. Student is required to answer **05 'SAQs' out of 06 'SAQs'**, each carrying 05 Marks, on Credit 01 to 04, for total 25 Marks. One SAQ will be on each Credit. 3. Student is required to answer **01 'LAQ' out of 2 LAQs,** of 10 Marks on Credit 01 and Credit 02, for total 10 Marks. LAQ may consist of sub-questions. 4. Student is required to answer **01 'LAQ' out of 2 LAQs,** of 10 Marks on Credit 03 and Credit 04, for total 10 Marks. LAQ may consist of sub-questions. 5. Student is required to answer **01 'LAQ' out of 2 LAQs,** of 10 Marks on Credit 01 to Credit 04, for total 10 Marks. LAQ may consist of sub-questions. 6. Number of attempts: Till Valid Registration Period (VRP) only 7. Marks: 70 Marks 8. Duration: 150 minutes

<table>
<tr><th>SN</th><th>Type of Course</th><th colspan="2">Continuous Assessment (CA)</th><th>End Examination (EE)</th></tr>
<tr><td></td><td></td><td colspan="2"><table>
<tr><td>S N</td><td>Description</td><td>Evaluation of End Examination(EE)</td><td>Marks</td></tr>
<tr><td rowspan="3">1</td><td rowspan="3">Question Types</td><td>Very Short Answer Question (VSAQ) on each Credit</td><td>03 Marks</td></tr>
<tr><td>Short Answer Question (SAQ) on each Credit</td><td>05 Marks</td></tr>
<tr><td>On each Credit, either Single Long Answer Question (LAQ) or LAQ contains sub-questions (a), (b) and so on.</td><td>10 Marks</td></tr>
<tr><td>2</td><td>Grand Total Marks</td><td>Total five Questions in EE Question paper based on:
Credit 01 to 04 : 05 VSAQs out of 06 VSAQs (15 Marks)
Credit 01 to 04 : 05 SAQs out of 06 SAQs (25 Marks)
Credit 01 to 02 : 01 LAQ out of 02 LAQs (10 Marks)
Credit 03 to 04 : 01 LAQ out of 02 LAQs (10 Marks)
Credit 01 to 04 : 01 LAQ out of 02 LAQs (10 Marks)
LAQ may contains sub-questions</td><td>70 Marks</td></tr>
</table></td><td></td></tr>
<tr><td>2</td><td>Theory (T)

2 Credit
50 Marks

CA: 30%
EE: 70%</td><td colspan="2">Each student is required to attempt total 01 (One) “Continuous Assessment (CA)” for each course of each Semester, as per the following details:
1. CA01: 1 (One) ‘Continuous Assessment 01 (CA01)’ on Credit 01 and Credit 02 of each course, consists of
• 1 (One) ‘Short Answer Question (SAQ)’ of 5 Marks
and
• 1 (One) ‘Long Answer Question (LAQ)’of 10 Marks, LAQ may consist of sub-questions.
CA01: On Credit 01 and Credit 02, of Marks = (5 + 10) = 15 Marks
2. Maximum number of attempts for CA, during each semester: Single attempt only
3. Total Marks: 15 Marks</td><td>1. Student is required to answer 05 ‘VSAQs’ out of 06 ‘VSAQs’, each carrying 03 Marks, on Credit 01 to 02, for total 15 Marks. One VSAQ will be on each Credit.
2. Student is required to answer 02 ‘SAQs’ out of 03 ‘SAQs’, each carrying 05 Marks, on Credit 01 to 02, for total 10 Marks. One SAQ will be on each Credit.
3. Student is required to answer 01 ‘LAQ’ out of 2 LAQs, of 10 Marks on Credit 01 and Credit 02, for total 10 Marks. LAQ may consist of sub-questions.
4. Number of attempts: Till Valid Registration Period (VRP) only
5. Marks: 35 Marks
6. Duration: 75 minutes</td></tr>
</table>

<table>
<tr><th>SN</th><th>Type of Course</th><th colspan="2">Continuous Assessment (CA)</th><th colspan="2">End Examination (EE)</th></tr>
<tr><td></td><td></td><td colspan="4">
<table>
<tr><th>SN</th><th>Description</th><th>Evaluation of End Examination (EE)</th><th>Marks</th></tr>
<tr><td rowspan="3">1</td><td rowspan="3">Question Types</td><td>Very Short Answer Question (VSAQ) on each Credit</td><td>03 Marks</td></tr>
<tr><td>Short Answer Question (SAQ) on each Credit</td><td>05 Marks</td></tr>
<tr><td>On each Credit, either Single Long Answer Question (LAQ) or LAQ contains sub-questions (a), (b) and so on.</td><td>10 Marks</td></tr>
<tr><td>2</td><td>Grand Total Marks</td><td>Total three Questions in EE Question paper based on:
Credit 01 to 02 : 05 VSAQs out of 06 VSAQs (15 Marks)
Credit 01 to 02 : 02 SAQs out of 03 SAQs (10 Marks)
Credit 01 to 02 : 01 LAQ out of 02 LAQs (10 Marks)
LAQ may contains sub-questions</td><td>35 Marks</td></tr>
</table>
</td></tr>
<tr><td>3</td><td>Practical (P)

4 Credit
100 Marks

CA: 50%
EE: 50%</td><td colspan="2">
1. Student is required to submit “Activity Report in Work-Book Format” for each Credit in the prescribed format.
2. Maximum number of attempts for each CA, during each semester : Single attempt only
3. Marks: 50 Marks
4. Grading criteria:
<table>
<tr><td>Lab Punctuality, Preparedness & Ethics</td><td>Irregular in lab. Copies the experiment from others
(0 Points)</td><td>Consistently regular but unable to explain the concepts
(06 Points)</td><td>Punctuality in lab. Follows the procedure and responds to questions asked
(10 Points)</td></tr>
<tr><td>Activity Report and Performance

(Experiment No, Date, Objectives, Apparatus with specification, Observations, Graphs, software used if any)</td><td>Poor Documentation and copied the experiment from others. Couldn't perform the Activity /poor observation made
(04 Points)</td><td>Average Documentation: Report is in format but some of the formatting guidelines are missed. Performed the Activity but observations made with some mistakes
(12 Points)</td><td>Good Documentation: Lab activity writing is in proper format with all references, Grammar. Performed the Activity on time observations made with no mistakes
(20 Points)</td></tr>
<tr><td>Results and Conclusion</td><td>Unable to achieve the desired results but makes attempts to relate data to theory. Poor concluding statements
(08 Points)</td><td>Average graphical and tabulated representation with misinterpret physical significance of theory. Achieve the desired results and but insufficient conclusion statement.
(14 Points)</td><td>Analyses and interpret observed data carefully with good graphical and tabulated representation using appropriate theory/evidence. Achieve the results and reach to appropriate Conclusion
(20 Points)</td></tr>
</table>
</td><td colspan="2">
External and internal examiners shall assess each student based on:
1. Workbook/Activity Report submission by the student (Only by External Examiner) [05 Marks]
2. Practical Activity performed by the student [12 Marks]
3. Result and Conclusion of the Practical Activity [13 Marks]
4. Viva-Voce on Practical Activities [20 Marks]
5. Number of attempts: Till Valid Registration Period (VRP) only
6. Marks: 50 Marks
7. Duration: 180 minutes
</td></tr>
</table>

<table>
<tr><th>SN</th><th>Type of Course</th><th>Continuous Assessment (CA)</th><th>End Examination (EE)</th></tr>
<tr><td></td><td></td><td>
<table>
<tr><td rowspan="2">SN</td><td colspan="3">Evaluation of Practical End Examination</td></tr>
<tr><td>Description</td><td>Internal Examiner</td><td>External Examiner</td></tr>
<tr><td>1</td><td>Workbook/Activity Report</td><td>-</td><td>05 Marks</td></tr>
<tr><td>2</td><td>Actual Conduct of one randomly selected Practical Activity</td><td>02 Marks</td><td>10 Marks</td></tr>
<tr><td>3</td><td>Diagram, Synoptic Answers, Graph/Observation and Conclusion</td><td>03 Marks</td><td>10 Marks</td></tr>
<tr><td>4</td><td>Viva-Voce/Oral</td><td>05 Marks</td><td>15 Marks</td></tr>
<tr><td>5</td><td>Total</td><td>10 Marks</td><td>40 Marks</td></tr>
</table>
</td><td></td></tr>
<tr><td>4</td><td>Field Project (TW)

4 Credit
100 Marks

CA: 50%
EE: 50%</td><td>Students need to complete one month Field Project (Total Study hours 120 hrs including Activity Report). After completion of the field project, learners shall submit a report to the LSC - Programme Coordinator (PC) and Mentor/Guide.
1. Maximum number of attempts for each CA, during each semester: Single attempt only
2. Duration: 1 Month or 4 Weeks duration –i) After end examination of semester 02 and before beginning of semester 03 or
ii) Any one month during semester 02 duration
3. Marks: 50 Marks
4. Grading Criteria for Evaluation of FP (only by Mentor/Guide):
<table>
<tr><td>SN</td><td>Description</td><td>Marks</td></tr>
<tr><td>1</td><td>Key Definitions of Problem area and analysis of preliminary data</td><td>15</td></tr>
<tr><td>2</td><td>Work related to formats, Correspondence, Interactions and liaising etc</td><td>05</td></tr>
<tr><td>3</td><td>Field work and data collection</td><td>15</td></tr>
<tr><td>4</td><td>Analysis and Report</td><td>10</td></tr>
<tr><td>5</td><td>Feedback to community</td><td>05</td></tr>
<tr><td colspan="2">Total</td><td>50</td></tr>
</table>
</td><td>1. External and Internal examiners (Internal examiner - Programme Coordinator (PC) / Supervisor of LSC) shall assess each student based on:
a. Activity Report submission by the student (Only by External Examiner) [10 Marks]
b. Viva-Voce on Activity Report [40 Marks]
2. Number of attempts: Till Valid Registration Period (VRP) only
3. Marks: 50 Marks
4. Duration: 180 minutes</td></tr>
</table>

SN	Type of Course	Continuous Assessment (CA)	End Examination (EE)

SN	Evaluation of Field Project End Examination		
	Description	Internal Examiner (Programme Coordinator **(PC)/ Supervisor of LSC)**	External Examiner
1	Workbook/Report submission	-	10 Marks
2	Viva-Voce /Oral	10 Marks	30 Marks
3	Total	10 Marks	40 Marks

<table>
<tr><th>SN</th><th>Type of Course</th><th>Continuous Assessment (CA)</th><th>End Examination (EE)</th></tr>
<tr><td>5</td><td>OJT or Internship (TW)

4 Credit
100 Marks

CA: 50%
EE: 50%</td><td>
1. Students need to complete one month On Job Training (OJT) or Internship (Total Study hours 120 hrs including Internship Report) in any Industry/Organization/Institute/ R&D Division /Any Micro/Small/Medium/enterprise/Govt/NGO/ PSU/Online Internship related to major course.
2. Maximum number of attempts for each CA, during each semester: Single attempt only
3. Marks: 50 Marks
4. Duration: 1 Month or 4 Weeks –
i) After end examination of semester 02 and before beginning of semester 03.
or
ii) Any one month during semester 02 duration
5. Grading Criteria for Evaluation of OJT (or Intern) only by Mentor where the Internship is proposed to be imparted:
<table>
<tr><th>SN</th><th>Parameters</th><th>Marks Out of</th></tr>
<tr><td>1</td><td>Behaviors, Shows interest in assigned work, Willingness to learn</td><td>10</td></tr>
<tr><td>2</td><td>Accepts responsibility, Cooperates with co-workers and supervisors, Demonstrates organizational skills</td><td>10</td></tr>
<tr><td>3</td><td>Uses time, knowledge and expertise effectively, Analyzes problems effectively</td><td>10</td></tr>
<tr><td>4</td><td>Demonstrates creativity/ originality / any innovative contribution, Professional ethics and accountability</td><td>10</td></tr>
<tr><td>5</td><td>Writes effectively, Produces high quality work/Skill Proficiency</td><td>10</td></tr>
<tr><td colspan="2">Total</td><td>50</td></tr>
</table>
Document as Evidence: Activity report along with Certificate or Declaration, duly issued and signed by the concerned authority [To be assessed during EE] should be submitted during End Examination to the parent Learner support Centre (LSC).
</td><td>
At the end of second semester, Programme Coordinator (PC)/ Supervisor of LSC and 1 (one)External Examiner will complete ‘End Exam (EE)’ for all allotted students as follows:
1. Duration of EE: After Theory EE of second Semester
2. Programme Coordinator (PC)/ Supervisor of LSC and External Expert will have 20% and 80% weightage respectively in EE.
3. Number of attempts: Till Valid Registration Period (VRP) only
4. Marks for EE: 50 Marks
<table>
<tr><th>Parameter</th><th>PC /Supervisor of LSC</th><th>External Expert</th></tr>
<tr><td>Professional Attitude</td><td>-</td><td>05 Marks</td></tr>
<tr><td>Maintenance of Daily Diary</td><td>-</td><td>10 Marks</td></tr>
<tr><td>Internship Report</td><td>05 Marks</td><td>10 Marks</td></tr>
<tr><td>Viva/Oral</td><td>05 Marks</td><td>15 Marks</td></tr>
<tr><td>Total</td><td>10 Marks</td><td>40 Marks</td></tr>
</table>
</td></tr>
</table>

<table>
<tr><th>SN</th><th>Type of Course</th><th>Continuous Assessment (CA)</th><th>End Examination (EE)</th></tr>
<tr><td>6</td><td>Project Work (PW)

RP-I
4 Credit
100 Marks

CA: 50%
EE: 50%</td><td>1. Student is required to submit “Activity Report” based on Grading Criteria of the course in the prescribed format.
2. Maximum number of attempts for each CA, during each semester: Single attempt only
3. Marks: 50Marks
4. Grading Criteria:
<table><tr><td>SN</td><td>Desc</td><td>Marks</td></tr><tr><td>1</td><td>Seminar*</td><td>25</td></tr><tr><td>2</td><td>Research Proposal</td><td>25</td></tr></table>*To be conducted in Online/Offline mode at LSC.</td><td>1. External and internal examiners shall assess each student based on:
a. Project Report submission by the student (Only by External Examiner) [10 Marks]
b. Project Presentation by the student [20 Marks]
c. Viva-Voce on Project Report [20 Marks]
2. Number of attempts: Till Valid Registration Period (VRP) only
3. Marks: 50 Marks
4. Duration: 180 minutes</td></tr>
<tr><td colspan="3"><table><tr><td rowspan="2">SN</td><td colspan="3">Evaluation of Project Work End Examination</td></tr><tr><td>Description</td><td>Internal Examiner</td><td>External Examiner</td></tr><tr><td>1</td><td>Project Report</td><td>-</td><td>10 Marks</td></tr><tr><td>2</td><td>Project Presentation</td><td>05 Marks</td><td>15 Marks</td></tr><tr><td>3</td><td>Viva-Voce /Oral</td><td>05 Marks</td><td>15 Marks</td></tr><tr><td>4</td><td>Total</td><td>10 Marks</td><td>40 Marks</td></tr></table></td></tr>
<tr><td>7</td><td>Project Work (PW)

RP-II

6 Credit
150 Marks

CA: 50%
EE: 50%</td><td>1. Student is required to submit “Activity Report” based on Grading Criteria of the course in the prescribed format.
2. Maximum number of attempts for each CA, during each semester: Single attempt only
3. Marks: 75 Marks
4. Grading Criteria:
<table><tr><td>SN</td><td>Desc</td><td>Marks</td></tr><tr><td>1</td><td>Seminar*</td><td>30</td></tr><tr><td>2</td><td>Research Paper Presentation**</td><td>30</td></tr><tr><td>3</td><td>Project Report</td><td>15</td></tr></table>*To be conducted in Online/Off line mode at LSC.
** Journals/Conferences/ at LSC, in Online/Offline mode [This activity shall be organized by respective LSC in Online/Offline mode in case student didn’t get an opportunity for presentation at Journals/Conferences]</td><td>1. External and internal examiners shall assess each student based on:
a. Project Report submission by the student (Only by External Examiner) [20 Marks]
b. Project Presentation by the student [25 Marks]
c. Viva-Voce on Project Report [30 Marks]
2. Number of attempts: Till Valid Registration Period (VRP) only
3. Marks: 75 Marks
4. Duration: 180 minutes</td></tr>
</table>

<table>
<tr><th>SN</th><th>Type of Course</th><th colspan="2">Continuous Assessment (CA)</th><th>End Examination (EE)</th></tr>
<tr><td></td><td></td><td colspan="3"><table>
<tr><td rowspan="2">SN</td><td colspan="3">Evaluation of Project Work End Examination</td></tr>
<tr><td>Description</td><td>Internal Examiner</td><td>External Examiner</td></tr>
<tr><td>1</td><td>Project Report</td><td>-</td><td>20 Marks</td></tr>
<tr><td>2</td><td>Project Presentation</td><td>05 Marks</td><td>20 Marks</td></tr>
<tr><td>3</td><td>Viva-Voce /Oral</td><td>10 Marks</td><td>20 Marks</td></tr>
<tr><td></td><td>Total</td><td>15 Marks</td><td>60 Marks</td></tr>
</table></td><td></td></tr>
</table>

END OF DOC

DEB-UGC application for Programme approval for AY 2023-24

School of Sciences, YCMOU Nashik

(Formerly School of Architecture, Science and Technology)

Programme Project Report (PPR)

M.Sc. (Physics)

A. Programme project report (PPR)

Name of Programme:		
a	Programme's mission & objectives	**Mission**: The "Master of Science" is an innovative Programme based on a number of core courses in physics. Upon Post graduation, the students will be able to understand and appreciate the impact of "physics" in day-to-day life. Further, the students will be exposed to the current trends in research about "physics". **Objectives**: After successful completion of this programme, students will be able to 1. Identify, formulate and solve Physics problems 2. Design and conduct experiments as well as analyse and interpret data 3. Apply knowledge of Physics in a different stream of science and to communicate effectively. 4. Acquire ability to use the techniques, skills, and modern physical tools in real world application. 5. Engage in life-long learning and will have recognition.
b	Relevance of the Programme with HEI's Mission and Goals	Objects of the YCMOU (as per the YCMOU Act) which would be fulfilled by implementing the proposed program (a) To provide through instruction, teaching and training and other educational opportunities, access to larger and larger segment of population, and in particular to the disadvantaged groups such as those living in remote and rural areas including working people, housewives and other adults who wish to upgrade or acquire knowledge through studies in various fields; [1(a)] (b) To strengthen and diversify the degrees, diploma and certificate courses at various educational levels, to fulfill the knowledge, skills and development needs of the individuals, institutions and society in general, by relating, particularly, the courses, to the needs of the employment and economic development of the state on the basis of its natural and human resources; [1(b)] (c) To promote acquisition of knowledge in a rapidly developing and changing society and to continually offer opportunity of upgrading knowledge, training and skills in the context of innovations, research and discovery in all field of human endeavour by developing educational network with the use of modern communication media and technologies appropriate for a learning society; [1(c)] (d) To provide an innovative system of University level education, flexible and open, in regard to the methods

		and pace of learning, combination of courses, eligibility for enrolment, age of entry, conduct of examinations and operation of the program, with a review to promote learning and encourage excellence in all fields of knowledge; [1(d)] (e) To contribute to the improvement of the education system in the state by providing a non-formal channel complementary to the formal system and encouraging transfer of credits and exchange of teaching staff by making a wide use of text and other software developed by the University; [1(e)] (f) To develop innovative, need based Vocational courses and establish industry, institution linkage for developing the society; [1(f)] (g) To provide through incidental and non-formal means, for continuing and extension of education in various cultural forms, arts, crafts and skills of the country, raising their quality and improving their availability to the people; [1(g)] (h) To provide for the counseling and guidance to its students; [1(j)] (i) To provide major part of its resources and direct efforts in designing, developing and offering need-based and relevant vocational courses. [1(l)]
c	Nature of prospective target group of learners	Candidates with B.Sc. (PCM)/ B.Sc. Pass with Physics upto SY/B.Sc.(Electronics)/B.E./B. Tech. Degree or Equivalent pass Although similar PG Programme are offered by conventional institutes, the conventional educational system offers very little freedom to learners as regards when, where, and how to learn. The proposed programme aims to provide this freedom to learners to the maximum possible extent.
d	Appropriateness of programme to be conducted in Open and Distance Learning mode to acquire specific skills and competence Specify the expected learning outcomes in terms of: 1. Knowledge Attainment: 2. Skills and Competencies: Compliances of academic, professional & occupational standards:	The proposed programme aims to provide relevant skills as needed by the working professional to identify and solve challenging problems in physics, thus contributing to the ever-increasing demands of society and industry. The programme helps to develop scientific tempers and attitudes, which in turn can prove beneficial for society since scientific developments can make a nation or society grow at a rapid pace. After studying this program, students will be better equipped to learn and have a deep understanding of key physics concepts, principles, and theories relevant to the field of physics, analyze physics formulae, and are prepared to take on leadership roles in physics, governmental agencies, research institutions, and industries related to physics. This program uses the Open and Distance (ODL) Mode of Education: Theory, Practical, Field Project/OJT, and Research Project. The teaching-learning component is offered as face-to-face counseling by a qualified and experienced teacher at a recognized Learner Support Center (LSC), along with continuous assessment and offline materials and resources in printed book format or soft copy format. Hence, this program is appropriate to conduct in open and distance learning modes to acquire specified skills and competencies.

e Instructional Design

1. Curriculum Design **(*Outcome of Expert Committee meeting; Program Structure: specify the theory, practical, fieldwork, project, etc components*):**
2. Total Credit Points (*including course wise*):
3. Detailed Syllabi:
4. Duration of the program **(*Minimum & Maximum*):**
5. Medium of Instruction:
6. Type of Program **(*General/Technical/ Professional*):**
7. Faculty and Support Staff:
8. Instructional Design & Delivery Mechanism **(*Media to be used -print, audio, video, online, computer aided, web based, etc. (course wise)*):**

Student Support Service System **(*Specify the provisions to be made at Head Quarter, Regional Centers, Learner Support Centers and Web based, etc*):**

Semester pattern: This programme is of total 4 semesters. Distribution of the credits are as follows –

Sem	Mandatory Courses (DSC)			Elective Courses (DSE) (4 CR)	Other Courses (4 CR)/ (6 CR)	Total Courses (CR)
	Theory		Practical (4 CR)			
	(4 CR)	(2 CR)				
1	2	1	1	1	1 – Research Methodology (4 Credits)	**6** (22 CR)
2	2	1	1	1	Any one - OJT/ Field Projects (4 Credits)	**6** (22 CR)
3	2	1	1	1	1- Research Project (4 Credits)	**6** (22 CR)
4	2	-	1	1	1- Research Project (6 Credits)	**5** (22 CR)
Total	8 x 4 = 32	3 x 2 = 06	4 x 4 = (16 CR)	4 x 4 = (16 CR)	3 x 4 + 1 x 6 = (18 CR)	**23** (88 CR)
	(38 CR)					

Programme Structure:

SN	Course Category	Code	Course Name	CA	EE	TM	Type	CR	Min %
[Level 6.0] Semester 01: 22 Credits									
01	Mandatory (DSC)	PHY501	Classical Mechanics	30	70	100	T	4	40%
02	Mandatory (DSC)	PHY502	Electronic Devices	30	70	100	T	4	40%
03	Mandatory (DSC)	PHY503	Mathematical Methods in Physics	15	35	50	T	2	40%
04	Mandatory (DSC)	PHY504	Physics I – Practical	50	50	100	P	4	40%
05	RM	RES505	Research Methodology	30	70	100	T	4	40%
Elective (DSE) Courses (Select Any One)									
06	Elective (DSE)	PHY506	Experimental Techniques in Physics	30	70	100	T	4	40%
07	Elective (DSE)	PHY507	Physics of LASERs	30	70	100	T	4	40%
[Level 6.0] Semester 02 : 22 Credits									
08	Mandatory (DSC)	PHY509	Atomic and Molecular Physics	30	70	100	T	4	40%
09	Mandatory (DSC)	PHY510	Electrodynamics	30	70	100	T	4	40%
10	Mandatory (DSC)	PHY511	Quantum Mechanics-I	15	35	50	T	2	40%
11	Mandatory (DSC)	PHY512	Physics II – Practical (Computational Methods using 'C' program)	50	50	100	P	4	40%
12	OJT/FP	PHY513 or PHY514	Any one OJT or FP	50	50	100	TW	4	40%
Elective (DSE) Courses (Select Any One)									
13	Elective (DSE)	PHY515	Fundamentals of Materials Science	30	70	100	T	4	40%

14	Elective (DSE)	PHY516	Medical Physics	30	70	100	T	4	40%
Exit option: PGD 11- PHY (44 Credits) after Three Year UG Degree									
[Level 6.5] Semester 03 : 22 Credits									
15	Mandatory (DSC)	PHY601	Statistical Mechanics	30	70	100	T	4	40%
16	Mandatory (DSC)	PHY602	Condensed Matter Physics	30	70	100	T	4	40%
17	Mandatory (DSC)	PHY603	Quantum Mechanics - II	15	35	50	T	2	40%
18	Mandatory (DSC)	PHY604	Physics III - Practical	50	50	100	P	4	40%
19	RP	PHY605	Research Project	50	50	100	PW	4	40%
Elective (DSE) Courses (Select Any One)									
20	Elective (DSE)	PHY606	Physics of Thin Film	30	70	100	T	4	40%
21	Elective (DSE)	PHY607	Astronomy and Astrophysics	30	70	100	T	4	40%
22	Elective (DSE)	PHY608	Energy Studies	30	70	100	T	4	40%
[Level 6.5] Semester 04 : 22 Credits									
23	Mandatory (DSC)	PHY609	Nuclear and Particle Physics	30	70	100	T	4	40%
24	Mandatory (DSC)	PHY610	Electronic Instrumentation	30	70	100	T	4	40%
25	Mandatory (DSC)	PHY611	Physics IV – Practical	50	50	100	P	4	40%
26	RP	PHY612	Research Project	75	75	150	PW	6	40%
Elective (DSE) Courses (Select Any One)									
27	Elective (DSE)	PHY613	Physics of Nano Materials	30	70	100	T	4	40%
28	Elective (DSE)	PHY614	General Relativity & Cosmology	30	70	100	T	4	40%
29	Elective (DSE)	PHY615	Energy from Waste	30	70	100	T	4	40%
2 Years- 4 Semester PG Degree in Physics (88 credits) after Three Year UG Degree									

Total Credits: 88 and Total Courses:29 (with electives)
Detailed Syllabi: Available at https://drive.google.com/drive/folders/13lNyj1PT7qN-AAAi2eE8fwDAsCQFWMQz?tid=0B451Yjwt_acQR1VPSUQ4Qotvams

- Programme Outcomes and Courses Outcomes: Refer Annexure – I

Minimum programme duration: 2 years
Maximum Programme Duration: 4 years
Medium of Instruction: English
Type of Program: General
Faculty and Support Staff: Dr. Chetana Kamlaskar, Director, School of Sciences, Ms. Sweta D. Kapade (Academic coordinator) & Mr. Manish S Shingare (Academic coordinator), Mr. Nandkishor S. Sangle (Academic

		coordinator) **Instructional Design & Delivery Mechanism** : • **Minimum number of face-to-face counseling sessions:** 12 (for 4 Credits) • (For each theory type of course of 4 credits duration of each counseling session shall be 01 Clock Hour) • (For each Practical/Project type of course of 4 credits duration of each counseling session shall be 02 Clock Hour). • **Minimum number of face-to-face counseling sessions:** 6 (for 2 Credits) • (For each theory type of course of 2 credits duration of each counseling session shall be 01 Clock Hour) • **Minimum number of face-to-face counseling sessions:** 18 (for 6 Credits) • (For each Practical/Project type of course of 6 credits duration of each counseling session shall be 02 Clock Hour). • **Required study efforts**: Total 2640 Hours including Self-Study during all 4 semesters. 660 Hours (including Self-Study) during each semester. • **Attendance**: Minimum 80 % attendance recommended for all activity type of courses • **eBook**: eBook in SLM format for each course (Free Download from University website) at all semesters 01 to semester 04 **Student Support Service System**: At headquarter: Support from School, SSD, Evaluation Division and Exam Unit-3 At Regional Centers: From all 8 regional centers within MH At Learner Support Centers: Recognized Learner support centers within MH Web Based: http://ycmou.digitaluniversity.ac http://www.ycmou.ac.in
f	Procedure for admissions, curriculum transaction and evaluation 1. Define the Admission Policy **(*including web based tools to be adopted*:** 2. Eligibility Criteria: 3. Fee Structure: 4. Financial assistance	**Admissions procedure**: A customized "Online Annual Admission system" available at DU portal http://ycmou.digitaluniveristy.ac Online payment facility is made available using a credit card or debit card or internet banking. **Admission Eligibility**: Candidates with B.Sc. (PCM)/ B.Sc. Pass with Physics upto SY/B.Sc.(Electronics)/B.E./B. Tech. Degree or Equivalent pass **Total programme Fee**: Total ₹ 46,316/- for all 04 Semesters, which is duly approved by the university authorities **Curriculum Transaction**:

<table>
<tr>
<td></td>
<td>to Learners (if any):
5. Activity planner of all academic activities of the academic session:
6. Exit Option- PG Diploma Certificate:
Policy for Evaluation of learner progress along with methods and tools:</td>
<td>

01 SLM e-Book will be developed for each theory course
Total 12/06 Face-To-Face counseling sessions, each of 60 Minutes duration, will be provided at respective learner support center, for each theory course.
Total 12/18 Face-To-Face counseling sessions, each of 120 Minutes duration, will be provided at respective learner support center, for each practical/Field project/ OJT/ Research project course.
Curriculum updation will be after every 3 years

Activity planner:
Teaching-Learning of students admitted in a single academic year shall start from 01-Sep. every year. (For all Programmes)
<table>
<tr><th>SN</th><th>Activity Description</th><th>Odd semesters like
01, 03, 05 and 07
From 01-Sep Till 31-Jan</th><th>Even semesters like
02, 04, 06 and 08
From 01-Feb Till 31-Jul</th></tr>
<tr><td colspan="4">Admission: offered on Annual basis collectively for 2 semesters in each academic year.</td></tr>
<tr><td>01</td><td>Fresh and Further Yearly Admission</td><td>From June Till Aug</td><td>NA</td></tr>
<tr><td colspan="4">Teaching - Learning</td></tr>
<tr><td>02</td><td>Teaching – Learning (16 Weeks) & Backlog Clearing</td><td>From 01-Aug Till 21-Nov</td><td>From 01-Feb Till 23-May</td></tr>
<tr><td colspan="4">End Exam (EE) Form Submission (Required only for Repeater Students)</td></tr>
<tr><td>03</td><td>Online EE Form Submission by SCs/ students at University</td><td>On or Before 21-Oct</td><td>On or Before 23-Apr</td></tr>
<tr><td colspan="4">Continuous Assessment (CA) Submission</td></tr>
<tr><td>05</td><td>CA Availability</td><td>From 01-Sep Till 21-Nov</td><td>From 01-Mar Till 23-May</td></tr>
<tr><td>06</td><td>CA Submission by Students</td><td>From 01-Nov Till 30-Nov</td><td>From 01-May Till 31-May</td></tr>
<tr><td colspan="4">End Examination (EE)</td></tr>
<tr><td>07</td><td>End Exam for Theory Courses</td><td>From 25-Nov to 05-Dec</td><td>From 25-May to 05-Jun</td></tr>
<tr><td>08</td><td>EE for Activity Courses (Pr, TW, PW, STW, SV)</td><td>Immediately after the last day of end exam for theory courses, but positively before 15-Dec</td><td>Immediately after the last day of end exam for theory courses, but positively before 15-Jun</td></tr>
<tr><td>10</td><td>End Exam Result Declaration</td><td>On or Before 31-Jan</td><td>On or Before 31-Jul</td></tr>
<tr><td colspan="4">Semester End Vacation</td></tr>
<tr><td>11</td><td>Semester End Vacation</td><td>Jan</td><td>July</td></tr>
</table>
Policy:
Refer Evaluation pattern given in Annexure II.
For exit option:
PGD 11-PHY: Min 40% or better marks in total 12 courses without electives & 14 courses with electives (subjects) of total 44 credits at Semesters 01 to 02.
</td>
</tr>
<tr>
<td>g</td>
<td>Requirement of the Laboratory Support and Library Resources:
1. Laboratory Support to the learners (if any):
2. Provision of Practical book for learners (if any):
Provision of Virtual Reality Methods for Practical in case of Online</td>
<td>Laboratory requirement and Library Resources – Yes. Institutes/Colleges affiliated with conventional university offering M.Sc. (Physics) will be only recognized as a Learner support center of this university for this programme. So, requirement of laboratory support and library resources will be automatically ensured.
Recommended: Computer infrastructure with Wi-Fi/ broadband connection with Physics related software/tool.</td>
</tr>
</table>

	learning (*if any*):	
h	Cost Estimate of the Program and the Provisions: Indicate the Budgetary Requirement for: 1. Programme Development 2. Program Delivery Program Maintenance	Budget provision for this development under A.27.P.38: Fees/Royalties/ Honorarium to Writer/Editors/Trans.
i	Quality Assurance Mechanism and expected Program Outcomes*: 1. Define the Review Mechanism of the Program for enhancing the standards of curriculum, instructional design relevant to professional requirements: 2. Define Program Benchmark Statements: 3. Mechanism for Monitoring the effectiveness of the program: ***(Minimum standards must adhere to "UGC Open and Distance Learning Programmes and Online Programmes Regulations, 2020" & directions of the Statutory Bodies of the University)**	M.Sc. (Physics) programme is designed to provide scientific as well as professional level competency to learners, and offers advanced theoretical as well as practical knowledge to learners. This programme enables the learner to develop interest in knowing more about the Physics and to develop research attitude. University has policy to review and revise every course at least once in five years of its launching. The following key result areas will be closely monitored. i. Enrolment of student (Equated Access) ii. Equal weightage for each credit in student evaluation iii. Demonstrate in-depth knowledge of Physics, both in theory and practical iv. Examination Results v. Placements/satisfaction of passing out students Administrative/stakeholder feedback

B. **Duration & Nomenclature**

Name of Programme :-	M.Sc. in Physics
Medium	English
Year	2 Years
Level	PG
Academic Session	2023-24
Entry Qualification (as per the Specification of Degrees, 2014)	Candidates with B.Sc. (PCM)/ B.Sc. Pass with Physics upto SY/B.Sc. (Electronics)/B.E./B. Tech. Degree or Equivalent pass
Duration (as per the Specification of Degrees, 2014)	2 Years
Name of the Department	School of Sciences

C. **Mode of Evaluation**

Year	2023
Whether Weightages to continuous assessment and end semester examinations or term end	Yes 1. 30% - 70% weightage Pattern for theory

examinations as per clause mentioned in Regulations	2. 50% - 50% Weightage pattern for Practical/OJT/FP/RP	
Examination Scheme	Formative and Summative	
Percentage of Continuous Assessment (%)	Theory	30%
	Practical/OJT/FP/RP	50%
Percentage of Term End Examination (%)	Theory	70%
	Practical/OJT/FP/RP	50%
Pass or Fail Criteria	40% for Pass	
Pass/Fail Criteria (% Pass Marks)	40% and above - Pass Below 40 % - Fail	

D. Mode of Examination

Whether examination through Online(For ODL Programs)	No

E. SLM Development (Submit all SLM in pdf in pendrive and prepare the SLM availability sheet in the order as per sample in pdf for each program separately)

Particulars	% SLM in house developed	% SLM in collaboration with with HEI(It should not be more than 40% of total SLM .If it is in collaboration then provide MOU in Soft & Hard copy
Printing Material	100%	–
Audio-Video Material	-	–
Online Material	Yes [pdf of SLMs]	–
Compute based Material	–	–

F. Program wise faculty details (Requirement of Minimum three faculty not below the rank of Assistant Professor to be furnished in the following format – to be taken from Establishment

Sr. No.	Emp. No	Name of the Faculty	Designation	Date of Joining	Qualification	Specialization	Teaching experience	Address	Phone no	Email	Appointment letter
1	1	Ms. Sweta D. Kapade	Academic Coordinator	13/01/2020	M.Sc. Physics B.Ed. JRF NET	Physics	08 Years	YCMOU	9156104758	Swetakapade222@gmail.com	
2	2	Mr. Manish Shingare	Academic Coordinator	03/02/2022	M.Sc. Physics	Physics	14 Years	YCMOU	8888948182	manish.shingare1985@gmail.com	
3	Y1054	Mr. Nandkishor S. Sangle	Academic Coordinator	07/03/2024	M.Sc. Physics, SET,(Ph.D. Pursuing)	Physics	11 Years	YCMOU	8668777508	nksangle1990@gmail.com	04/03/2024

G. List of Learner Support Centres Program wise and Region wise to be submitted as per following format. (We have intimated the same to Director SSD. **You are requested to give him the list of programs for which the LSCs data is required.**) – to be taken from SSD Director

Sr. No	Study centre code	Name & Address of LSC	Name of the HEI to which college/Institute is affiliated (where LSC is established)	Whether the College /Institute Private or Govt. (where LSC is established)	Name and Contact Details of Coordinator/ counsellor :	Qualification of Coordinator/ Counsellor :	No. of Counsellor :	Name of Proposed Programmes/ Course from July, 2023 onwards:	Approved	Not Approved with Reason

Annexure – I

Programme Objectives, Scope of the Programme & Programme Outcomes (PO)

And

Course Outcomes (CO)

<table>
<tr><td colspan="3">Programme Name: Master of Science (Mathematics)</td></tr>
<tr><td>1</td><td>Programme Objectives</td><td>This programme has the following broad objectives:
Identify, formulate and solve Physics problems
Design and conduct experiments as well as analyse and interpret data
Apply knowledge of Physics in a different stream of science and to communicate effectively.
Acquire ability to use the techniques, skills, and modern physical tools in real world application.
Engage in life-long learning and will have recognition.</td></tr>
<tr><td>2</td><td>Scope of the Programme</td><td>After successful completion of this programme, students may get opportunities in various fields/sectors to work as
Career opportunities in both private and government sector/ in India and abroad
Job opportunities in allied sectors [High Tech Industries, Medical Labs, Government Hospitals, Medical Research Labs, Defense Services, Nuclear Power Plants, Aerospace Sector, Research Analyst, Space and Astronomy, Healthcare, Technology, Geo-Physics and meteorology, College Lecturer/ Professor Banking, Business/ Start-up
Inculcation of research attitude
Inculcation of entrepreneurship
Perceive higher education and research in the same field</td></tr>
<tr><td>3</td><td>Programme Outcome</td><td>After successful completion of this programme, students will be able to
Enhance Knowledge to comprehend and appreciate a great variety of phenomena occurring in the Universe, both at micro and macroscopic level in non- relativistic as well as relativistic realm through understanding of basic concepts of Physics.
Exposure to research within one of the research areas represented at the Department of Physics, through supervised Master Dissertation project.
Adequate analytical skills on the advanced levels of Physics, needed for plethora of job opportunities in education, research, and industry.
Competence in core areas of Physics, which is in line with the international standards, aimed at realizing the goals towards skilled India.</td></tr>
<tr><td>4</td><td>Course Outcomes</td><td><table><tr><th>SN</th><th>Course Code &</th><th>Course Outcomes</th></tr></table></td></tr>
</table>

	Name	
	Semester 1	
1	PHY501: Classical Mechanics	After successful completion of this course, student will be able to • Describe the laws governing the motion of a system of particles. • Define Lagrange's equations of motion. • Explain the role played by Hamilton's principle in classical mechanics • Explain the function Routhian like the Lagrangian and the Hamiltonian • Describe the role of canonical transformations in Hamitonian mechanics • Clarify the rotations in a plane and space • Underastand variational principles to real physical problems
2	PHY502: Electronic Devices	After successful completion of this course, student will be able to • Explain structure and working principles of few important analog and digital electronics devices. • Explain the characteristics, working principle and applications of Timer IC, VCO, PLL • Characterized the types of Power Supply, ADC, DAC and Logic Families
3	PHY503:Mathematical Methods In Physics	After successful completion of this course, student will be able to • Understand the basic concepts of mathematics required to solve complex problems in physics • Explain linear ODEs with constant coefficients • Apply the concept of Fourier transform in Physics
4	PHY504: Physics I– Practical	After successful completion of this course, student will be able to • Explain a concept used in electronic devices and circuits • Gain a hands on experience working with real time circuits, to translate theory into practice • Design, Test and verify the operation of simple circuits
5	RES505: Research Methodology	After successful completion of this course, student will be able to • Understand some basic concepts of research and its methodologies.

				• Select proper method of Data collection & representation • Select and apply appropriate statistical method for data analysis. • Perform literature review, research writings with the knowledge of Intellectual Property Rights. • Identify and address ethical considerations in research, ensuring the protection of participants and data integrity.
		6	PHY506: Experimental Techniques In Physics	After successful completion of this course, student should be able to • Understand the important concepts and methods in experimental techniques • Explain the working principles of the various techniques in experimental Physics • Analyze the most commonly employed Characterization techniques used in Physics
		7	PHY507: Physics of LASERs	After successful completion of this course, student should be able to • Describe the concept of stimulated emission and what is an active medium • Describe the different types of lasers, its principle, properties of laser beam and significance of the Lasers materials • Understand Laser Physics, and Laser devices to analyze and quantify complex problems in the field of nanotechnology
		Semester 2		
		8	PHY509: Atomic And Molecular Physics	After successful completion of this course, student should be able to • Explain the change in behavior of atoms in external applied electric and magnetic field • Correlate rotational, vibrational, electronic and rotation-vibration spectra of molecules • Understand the interaction of atoms in strong and weak magnetic field • Characterized a broad knowledge of the most important concept of atoms and molecules • Understand different spectroscopic techniques and their significance
		9	PHY510: Electrodynamics	After successful completion of this course, student should be able to • Understand the concepts of electrodynamics and Maxwell equations and their applications in various situations

				• Understand concepts in electric field and scalar potential, magnetic field and vector potential • Identify electromagnetic potentials, gauge transformations and Lorentz transformations. • Inhomogeneous wave equations and their significance • Understanding the electrodynamics to create a scientific temperament
		10	PHY511: Quantum Mechanics- I	After successful completion of this course, student should be able to • Explore the basic concepts of quantum Mechanics • Solve special functions and matrices for solving Quantum Mechanical Problems • Understand various quantum mechanical features by solving various potentials: example, Finite and infinite well, Harmonic oscillator • Apply the time – dependent and time – independent Schrödinger's equations • Apply the knowledge of Variational Methods for particle in box, Harmonic oscillator and Delta Function along with WKB approximation for classical Region and Tunneling
		11	PHY512: Physics II – Practical (Computational Methods using 'C' program)	After successful completion of this course, student should be able to • Use numerical methods in solving problems in Physics. • Develop logics which will help to programme with the C high-level language. • Analyze data using computational methods. • Identify modern programming methods and describe the extent and limitations of computational methods in Physics
		12	MAT513: OJT	After successful completion of this course, student should be able to – • Demonstrate proficiency in applying theoretical knowledge and academic concepts to real-world professional situations. • Possess job-specific skills that are relevant to their chosen field of study, enabling them to perform tasks and responsibilities effectively and efficiently. • Acquire a comprehensive understanding of industry practices, trends, and challenges, contributing to their overall knowledge and expertise in the field. • Establish professional networks and relationships, expanding their professional connections and opportunities for future

				collaborations and career advancement. • Develop problem-solving and critical thinking abilities, demonstrating the ability to analyze complex situations, make informed decisions, and propose effective solutions. • Demonstrate professionalism, adaptability, and effective communication skills in a professional work environment.
		13	MAT514:FP	After successful completion of this course, student should be able to – • Participate in the projects in industries during his or her industrial training. • Describe use of advanced tools and techniques encountered during industrial training and visit. • Interact with industrial personnel and follow engineering practices and discipline prescribed in industry. • Develop awareness about general workplace behavior and build interpersonal and team skills. • Prepare professional work reports and presentations.
		14	PHY515: Fundamentals Of Materials Science	After successful completion of this course, student should be able to • Explain importance of materials in materials science and engineering field. • Classify materials according to their types • Describe basic definition and conception of materials and physical properties of materials
		15	PHY516: Medical Physics	After successful completion of this course, student should be able to • Apply expert theoretical knowledge and an integrated understanding across all areas of medical physics. • Utilise advanced problem-solving skills to analyse outputs and synthesise complex information in applying medical physics knowledge into clinical practice. • Apply advanced theoretical and technical skills to perform and critically evaluate quality assurance procedures for medical physics • Demonstrate an expert understanding of the roles and responsibilities of medical physicists in patient care and public safety, as part of diverse interdisciplinary teams. • Interpret the significance and scope of ethical principles and the application of these principles in medical physics.

			Semester 3		
		16	PHY601: Statistical Mechanics	After successful completion of this course, student should be able to • Explore the concepts of Phase space, Macro and Microstate • Interpret thermodynamic probability • Illustrate Maxwell-Boltzmann law - distribution of velocity • Validate Fermi-Dirac distribution law - electron gas and Bose-Einstein distribution law - photon gas • Describe and apply various aspects of statistical mechanics
		17	PHY602: Condensed Matter Physics	After successful completion of this course, student should be able to • Understand about the crystal structure, interaction with X-ray, lattice vibrations, defects, electronic properties and the magnetic properties. • Investigate the structural and physical properties of materials by developing better understanding of crystal structure with particular emphasis on studying the electrical and magnetic behavior of solids • Establish various theories of different classes of solids showing varying properties like magnetism, polarization and superconductivity • Explain the significance and value of condensed matter Physics.
		18	PHY603: Quantum Mechanics- II	After successful completion of this course, student should be able to • Investigate the basic concepts of quantum Mechanics • Understand the time – dependent and time – independent Schrödinger's equations • Use perturbation theory to find approximate solutions to more complex quantum mechanical systems • Learn Eigen values and Eigen functions of operators and computation of Clebsch–Gordan coefficients. • Explain approximation methods used in Quantum Mechanics
		19	PHY604: Physics- III- Practical	After successful completion of this course, student should be able to • Collect data and revise an experimental

					procedure iteratively and reflectively, • Evaluate the process and outcomes of an experiment quantitatively and qualitatively, • Extend the scope of an investigation whether or not results come out as expected, • Communicate the process and outcomes of an experiment, and • Conduct an experiment collaboratively and ethically.
			20	PHY605: Research Project - I	After successful completion of this course, student should be able to • Make students familiar with approach to do literature survey • Make student capable of independent thinking • Learn basic techniques for carrying out research
			21	PHY606: Physics Of Thin Film	After successful completion of this course, student should be able to • Understand the principle, differences and similarities, advantages, and disadvantages of different thin film deposition techniques. • Identify potential of thin film preparation method for future thin film application. • Understand about different instrumentation techniques and to analyze thin film properties to apply for various applications. • Understand, evaluate and use models for understanding nucleation and growth of thin films. • Improve problems solving skills related to evaluation of different properties of thin films
			22	PHY607 : Astronomy and Astrophysics	After successful completion of this course, student should be able to • Explain practical application of observational techniques • Solve problems with scientific reasoning and critical thinking skills • Understand the impact of astronomical bodies and formations on earth and climate. viii) Communicate astronomical concepts and theories effectively. • Describe the classification of stars, stellar evolution, interstellar matter, galaxies etc. • Current understanding and investigation of the basic knowledge about cosmic threats viz., comets, asteroids, meteoroids.

		23	PHY608: Energy Studies	After successful completion of this course, student should be able to • Understand the difference between renewable and non-renewable energy resources. • Define energy; Identify energy sources; • Analyse personal energy input and output
		Semester 4		
		24	PHY609: Nuclear And Particle Physics	After successful completion of this course, student should be able to • Describe the basic interaction mechanisms for charged particles and electromagnetic radiation and explain the working principles behind detectors and their characteristic properties with respect to energy resolution, efficiency etc • Identify the mechanism and kinematics of nuclear reactions • Describe the basic features involved in alpha and beta decays and nuclear forces • Understand Nuclear Structure, Comprehend Nuclear Reactions, Learn Radioactivity and Decay, Explore Nuclear Energy, Nuclear Medicine, and Develop Computational and Analytical Skills. • Study the atomic nuclei, their properties, interactions, and the forces that govern them. It explores the fundamental structure and behavior of atomic nuclei, as well as the processes of nuclear reactions and the applications of nuclear phenomena. • Expose to current research topics, emerging technologies, and recent developments in nuclear physics through lectures, literature reviews, or discussions • Apply the knowledge of nuclear physics can be valuable for pursuing advanced research or specialized careers in nuclear / radiation areas.
		25	PHY610: Electronic Instrumentation	After successful completion of this course, student should be able to • Recognize the evolution and history of units and standards in Measurements. • Identify the various parameters that are measurable in electronic instrumentation. • Employ appropriate instruments to measure given sets of parameters. • Practice the construction of testing and measuring set up for electronic systems. • Understand about instrumentation concepts

				which can be applied to Control systems. • Relate the usage of various instrumentation standards and data acquisition systems.
		26	PHY611: Physics IV-Practical	After successful completion of this course, student should be able to • Recognize the evolution and history of units and standards in Measurements. • Identify the various parameters that are measurable in electronic instrumentation. • Employ appropriate instruments to measure given sets of parameters. • Practice the construction of testing and measuring set up for electronic systems. • Understand about instrumentation concepts which can be applied to Control systems. • Relate the usage of various instrumentation standards.
		27	PHY612: Research Project	After successful completion of this course, student should be able to • Make students familiar with approach to do literature survey • Make student capable of independent thinking • Learn basic techniques for carrying out research
		28	PHY613: Physics Of Nano Materials	After successful completion of this course, student should be able to • Understand in broad outline of Nanoscience and Nanotechnology. • Explain the effects of quantum confinement on the electronic structure and corresponding physical and chemical properties of materials at nanoscale • Correlate properties of nanostructures with their size, shape and surface characteristics. • Choose appropriate synthesis technique to synthesize quantum nanostructures of desired size, shape and surface properties • Focus on the design and development of efficient innovative nanostructured materials prepared by various methodologies and physicochemical characterization for technological applications • Explore the various applications of nanomaterials

		29	PHY614: General Relativity & Cosmology	After successful completion of this course, student should be able to • Gain familiarity with basic concepts from differential geometry and apply them in studying General Relativity • Apply and solve Einstein equations for systems such as a spherically symmetric star, black hole, and an isotropic and homogeneous Universe • Apply their understanding of General Relativity to current areas of research such as gravitational waves
		30	PHY615: Energy From Waste	After successful completion of this course, student should be able to • Apply the knowledge about the operations of Waste to Energy Plants. • Analyse the various aspects of Waste to Energy Management Systems. • Carry out Techno-economic feasibility for Waste to Energy Plants. • Apply the knowledge in planning and operations of Waste to Energy plants.

Appendix II

Evaluation Pattern

SN	Type of Course	Continuous Assessment (CA)	End Examination (EE)
1	Theory (T) 4 Credit 100 Marks CA: 30% EE: 70%	Each student is required to attempt total 02 (Two) "Continuous Assessments (CAs)" for each course of each Semester, as per the following details: 1. CA01: 'Continuous Assessment 01 (CA01)' on Credit 01 to Credit 04 of each course, consists of • 2 (Two) 'Short Answer Questions (SAQs)',each carrying 05 Marks, on Credit 01 and Credit 02 **and** • 1 (One) 'Long Answer Question (LAQ)' of 10 Marks, on Credit 03 and Credit 04. LAQ may consist of sub-questions. **CA01**: On Credit 01 to Credit 04, of Marks = (5x2 + 10) = **20 Marks** 2. CA02: 'Continuous Assessment 02 (CA02)' on Credit 01 to Credit 04 of each course, consists of • A test containing total **10** (Ten) 'Objective Type Questions, ' 05 (Five) on Credit 01 and Credit 02,and 05 (Five) on Credit 03 and Credit 04. Each 'Objective Type Question' of 1 Mark. **CA02**: On Credit 01 to Credit 04, of Marks = **10 Marks** 3. Maximum number of attempts for **CA,** during each semester : Single attempt only 4. **Total Marks**: **30** Marks	1. Student is required to answer **05 'VSAQs' out of 06 'VSAQs'**, each carrying 03 Marks, on Credit 01 to 04, for total 15 Marks. One VSAQ will be on each Credit. 2. Student is required to answer **05 'SAQs' out of 06 'SAQs'**, each carrying 05 Marks, on Credit 01 to 04, for total 25 Marks. One SAQ will be on each Credit. 3. Student is required to answer **01 'LAQ' out of 2 LAQs,** of 10 Marks on Credit 01 and Credit 02, for total 10 Marks. LAQ may consist of sub-questions. 4. Student is required to answer **01 'LAQ' out of 2 LAQs,** of 10 Marks on Credit 03 and Credit 04, for total 10 Marks. LAQ may consist of sub-questions. 5. Student is required to answer **01 'LAQ' out of 2 LAQs,** of 10 Marks on Credit 01 to Credit 04, for total 10 Marks. LAQ may consist of sub-questions. 6. Number of attempts: Till Valid Registration Period (VRP) only 7. Marks: 70 Marks 8. Duration: 150 minutes

<table>
<tr><th>SN</th><th>Type of Course</th><th colspan="2">Continuous Assessment (CA)</th><th>End Examination (EE)</th></tr>
<tr><td></td><td></td><td colspan="2"><table>
<tr><td>S N</td><td>Description</td><td>Evaluation of End Examination(EE)</td><td>Marks</td></tr>
<tr><td rowspan="3">1</td><td rowspan="3">Question Types</td><td>Very Short Answer Question (VSAQ) on each Credit</td><td>03 Marks</td></tr>
<tr><td>Short Answer Question (SAQ) on each Credit</td><td>05 Marks</td></tr>
<tr><td>On each Credit, either Single Long Answer Question (LAQ) or LAQ contains sub-questions (a), (b) and so on.</td><td>10 Marks</td></tr>
<tr><td>2</td><td>Grand Total Marks</td><td>Total five Questions in EE Question paper based on:
Credit 01 to 04 : 05 VSAQs out of 06 VSAQs (15 Marks)
Credit 01 to 04 : 05 SAQs out of 06 SAQs (25 Marks)
Credit 01 to 02 : 01 LAQ out of 02 LAQs (10 Marks)
Credit 03 to 04 : 01 LAQ out of 02 LAQs (10 Marks)
Credit 01 to 04 : 01 LAQ out of 02 LAQs (10 Marks)
LAQ may contains sub-questions</td><td>70 Marks</td></tr>
</table></td><td></td></tr>
<tr><td>2</td><td>Theory (T)

2 Credit
50 Marks

CA: 30%
EE: 70%</td><td colspan="2">Each student is required to attempt total 01 (One) “Continuous Assessment (CA)” for each course of each Semester, as per the following details:
1. CA01: 1 (One) ‘Continuous Assessment 01 (CA01)’ on Credit 01 and Credit 02 of each course, consists of
• 1 (One) ‘Short Answer Question (SAQ)’ of 5 Marks
and
• 1 (One) ‘Long Answer Question (LAQ)’of 10 Marks, LAQ may consist of sub-questions.
CA01: On Credit 01 and Credit 02, of Marks = (5 + 10) = 15 Marks
2. Maximum number of attempts for CA, during each semester: Single attempt only
3. Total Marks: 15 Marks</td><td>1. Student is required to answer 05 ‘VSAQs’ out of 06 ‘VSAQs’, each carrying 03 Marks, on Credit 01 to 02, for total 15 Marks. One VSAQ will be on each Credit.
2. Student is required to answer 02 ‘SAQs’ out of 03 ‘SAQs’, each carrying 05 Marks, on Credit 01 to 02, for total 10 Marks. One SAQ will be on each Credit.
3. Student is required to answer 01 ‘LAQ’ out of 2 LAQs, of 10 Marks on Credit 01 and Credit 02, for total 10 Marks. LAQ may consist of sub-questions.
4. Number of attempts: Till Valid Registration Period (VRP) only
5. Marks: 35 Marks
6. Duration: 75 minutes</td></tr>
</table>

<table>
<tr><th>SN</th><th>Type of Course</th><th colspan="2">Continuous Assessment (CA)</th><th colspan="2">End Examination (EE)</th></tr>
<tr><td></td><td></td><td colspan="4">
<table>
<tr><th>SN</th><th>Description</th><th>Evaluation of End Examination (EE)</th><th>Marks</th></tr>
<tr><td rowspan="3">1</td><td rowspan="3">Question Types</td><td>Very Short Answer Question (VSAQ) on each Credit</td><td>03 Marks</td></tr>
<tr><td>Short Answer Question (SAQ) on each Credit</td><td>05 Marks</td></tr>
<tr><td>On each Credit, either Single Long Answer Question (LAQ) or LAQ contains sub-questions (a), (b) and so on.</td><td>10 Marks</td></tr>
<tr><td>2</td><td>Grand Total Marks</td><td>Total three Questions in EE Question paper based on:
Credit 01 to 02 : 05 VSAQs out of 06 VSAQs (15 Marks)
Credit 01 to 02 : 02 SAQs out of 03 SAQs (10 Marks)
Credit 01 to 02 : 01 LAQ out of 02 LAQs (10 Marks)
LAQ may contains sub-questions</td><td>35 Marks</td></tr>
</table>
</td></tr>
<tr><td>3</td><td>Practical (P)

4 Credit
100 Marks

CA: 50%
EE: 50%</td><td colspan="2">
1. Student is required to submit “Activity Report in Work-Book Format” for each Credit in the prescribed format.
2. Maximum number of attempts for each CA, during each semester : Single attempt only
3. Marks: 50 Marks
4. Grading criteria:
<table>
<tr><td>Lab Punctuality, Preparedness & Ethics</td><td>Irregular in lab. Copies the experiment from others
(0 Points)</td><td>Consistently regular but unable to explain the concepts
(06 Points)</td><td>Punctuality in lab. Follows the procedure and responds to questions asked
(10 Points)</td></tr>
<tr><td>Activity Report and Performance

(Experiment No, Date, Objectives, Apparatus with specification, Observations, Graphs, software used if any)</td><td>Poor Documentation and copied the experiment from others. Couldn't perform the Activity /poor observation made
(04 Points)</td><td>Average Documentation: Report is in format but some of the formatting guidelines are missed. Performed the Activity but observations made with some mistakes
(12 Points)</td><td>Good Documentation: Lab activity writing is in proper format with all references, Grammar. Performed the Activity on time observations made with no mistakes
(20 Points)</td></tr>
<tr><td>Results and Conclusion</td><td>Unable to achieve the desired results but makes attempts to relate data to theory. Poor concluding statements
(08 Points)</td><td>Average graphical and tabulated representation with misinterpret physical significance of theory. Achieve the desired results and but insufficient conclusion statement.
(14 Points)</td><td>Analyses and interpret observed data carefully with good graphical and tabulated representation using appropriate theory/evidence. Achieve the results and reach to appropriate Conclusion
(20 Points)</td></tr>
</table>
</td><td colspan="2">
External and internal examiners shall assess each student based on:
1. Workbook/Activity Report submission by the student (Only by External Examiner) [05 Marks]
2. Practical Activity performed by the student [12 Marks]
3. Result and Conclusion of the Practical Activity [13 Marks]
4. Viva-Voce on Practical Activities [20 Marks]
5. Number of attempts: Till Valid Registration Period (VRP) only
6. Marks: 50 Marks
7. Duration: 180 minutes
</td></tr>
</table>

<table>
<tr><th>SN</th><th>Type of Course</th><th>Continuous Assessment (CA)</th><th>End Examination (EE)</th></tr>
<tr><td></td><td></td><td>
<table>
<tr><td rowspan="2">SN</td><td colspan="3">Evaluation of Practical End Examination</td></tr>
<tr><td>Description</td><td>Internal Examiner</td><td>External Examiner</td></tr>
<tr><td>1</td><td>Workbook/Activity Report</td><td>-</td><td>05 Marks</td></tr>
<tr><td>2</td><td>Actual Conduct of one randomly selected Practical Activity</td><td>02 Marks</td><td>10 Marks</td></tr>
<tr><td>3</td><td>Diagram, Synoptic Answers, Graph/Observation and Conclusion</td><td>03 Marks</td><td>10 Marks</td></tr>
<tr><td>4</td><td>Viva-Voce/Oral</td><td>05 Marks</td><td>15 Marks</td></tr>
<tr><td>5</td><td>Total</td><td>10 Marks</td><td>40 Marks</td></tr>
</table>
</td><td></td></tr>
<tr><td>4</td><td>Field Project (TW)

4 Credit
100 Marks

CA: 50%
EE: 50%</td><td>Students need to complete one month Field Project (Total Study hours 120 hrs including Activity Report). After completion of the field project, learners shall submit a report to the LSC - Programme Coordinator (PC) and Mentor/Guide.
1. Maximum number of attempts for each CA, during each semester: Single attempt only
2. Duration: 1 Month or 4 Weeks duration –i) After end examination of semester 02 and before beginning of semester 03 or
ii) Any one month during semester 02 duration
3. Marks: 50 Marks
4. Grading Criteria for Evaluation of FP (only by Mentor/Guide):
<table>
<tr><td>SN</td><td>Description</td><td>Marks</td></tr>
<tr><td>1</td><td>Key Definitions of Problem area and analysis of preliminary data</td><td>15</td></tr>
<tr><td>2</td><td>Work related to formats, Correspondence, Interactions and liaising etc</td><td>05</td></tr>
<tr><td>3</td><td>Field work and data collection</td><td>15</td></tr>
<tr><td>4</td><td>Analysis and Report</td><td>10</td></tr>
<tr><td>5</td><td>Feedback to community</td><td>05</td></tr>
<tr><td colspan="2">Total</td><td>50</td></tr>
</table>
</td><td>1. External and Internal examiners (Internal examiner - Programme Coordinator (PC) / Supervisor of LSC) shall assess each student based on:
a. Activity Report submission by the student (Only by External Examiner) [10 Marks]
b. Viva-Voce on Activity Report [40 Marks]
2. Number of attempts: Till Valid Registration Period (VRP) only
3. Marks: 50 Marks
4. Duration: 180 minutes</td></tr>
</table>

SN	Type of Course	Continuous Assessment (CA)	End Examination (EE)

SN	Evaluation of Field Project End Examination		
	Description	Internal Examiner (Programme Coordinator **(PC)/ Supervisor of LSC)**	External Examiner
1	Workbook/Report submission	-	10 Marks
2	Viva-Voce /Oral	10 Marks	30 Marks
3	Total	10 Marks	40 Marks

<table>
<tr><th>SN</th><th>Type of Course</th><th>Continuous Assessment (CA)</th><th>End Examination (EE)</th></tr>
<tr><td>5</td><td>OJT or Internship (TW)

4 Credit
100 Marks

CA: 50%
EE: 50%</td><td>
1. Students need to complete one month On Job Training (OJT) or Internship (Total Study hours 120 hrs including Internship Report) in any Industry/Organization/Institute/ R&D Division /Any Micro/Small/Medium/ enterprise/Govt/NGO/PSU/Online Internship related to major course.
2. Maximum number of attempts for each CA, during each semester: Single attempt only
3. Marks: 50 Marks
4. Duration: 1 Month or 4 Weeks –
i) After end examination of semester 02 and before beginning of semester 03.
or
ii) Any one month during semester 02 duration
5. Grading Criteria for Evaluation of OJT (or Intern) only by Mentor where the Internship is proposed to be imparted:
<table>
<tr><th>SN</th><th>Parameters</th><th>Marks Out of</th></tr>
<tr><td>1</td><td>Behaviors, Shows interest in assigned work, Willingness to learn</td><td>10</td></tr>
<tr><td>2</td><td>Accepts responsibility, Cooperates with co-workers and supervisors, Demonstrates organizational skills</td><td>10</td></tr>
<tr><td>3</td><td>Uses time, knowledge and expertise effectively, Analyzes problems effectively</td><td>10</td></tr>
<tr><td>4</td><td>Demonstrates creativity/ originality / any innovative contribution, Professional ethics and accountability</td><td>10</td></tr>
<tr><td>5</td><td>Writes effectively, Produces high quality work/Skill Proficiency</td><td>10</td></tr>
<tr><td colspan="2">Total</td><td>50</td></tr>
</table>
Document as Evidence: Activity report along with Certificate or Declaration, duly issued and signed by the concerned authority [To be assessed during EE] should be submitted during End Examination to the parent Learner support Centre (LSC).
</td><td>
At the end of second semester, Programme Coordinator (PC)/ Supervisor of LSC and 1 (one) External Examiner will complete ‘End Exam (EE)’ for all allotted students as follows:
1. Duration of EE: After Theory EE of second Semester
2. Programme Coordinator (PC)/ Supervisor of LSC and External Expert will have 20% and 80% weightage respectively in EE.
3. Number of attempts: Till Valid Registration Period (VRP) only
4. Marks for EE: 50 Marks
<table>
<tr><th>Parameter</th><th>PC /Supervisor of LSC</th><th>External Expert</th></tr>
<tr><td>Professional Attitude</td><td>-</td><td>05 Marks</td></tr>
<tr><td>Maintenance of Daily Diary</td><td>-</td><td>10 Marks</td></tr>
<tr><td>Internship Report</td><td>05 Marks</td><td>10 Marks</td></tr>
<tr><td>Viva/Oral</td><td>05 Marks</td><td>15 Marks</td></tr>
<tr><td>Total</td><td>10 Marks</td><td>40 Marks</td></tr>
</table>
</td></tr>
</table>

<table>
<tr><th>SN</th><th>Type of Course</th><th>Continuous Assessment (CA)</th><th>End Examination (EE)</th></tr>
<tr><td>6</td><td>Project Work (PW)

RP-I
4 Credit
100 Marks

CA: 50%
EE: 50%</td><td>1. Student is required to submit “Activity Report” based on Grading Criteria of the course in the prescribed format.
2. Maximum number of attempts for each CA, during each semester: Single attempt only
3. Marks: 50Marks
4. Grading Criteria:
<table>
<tr><td>SN</td><td>Desc</td><td>Marks</td></tr>
<tr><td>1</td><td>Seminar*</td><td>25</td></tr>
<tr><td>2</td><td>Research Proposal</td><td>25</td></tr>
</table>
*To be conducted in Online/Offline mode at LSC.</td><td>1. External and internal examiners shall assess each student based on:
a. Project Report submission by the student (Only by External Examiner) [10 Marks]
b. Project Presentation by the student [20 Marks]
c. Viva-Voce on Project Report [20 Marks]
2. Number of attempts: Till Valid Registration Period (VRP) only
3. Marks: 50 Marks
4. Duration: 180 minutes</td></tr>
<tr><td></td><td></td><td colspan="2">
<table>
<tr><td rowspan="2">SN</td><td colspan="3">Evaluation of Project Work End Examination</td></tr>
<tr><td>Description</td><td>Internal Examiner</td><td>External Examiner</td></tr>
<tr><td>1</td><td>Project Report</td><td>-</td><td>10 Marks</td></tr>
<tr><td>2</td><td>Project Presentation</td><td>05 Marks</td><td>15 Marks</td></tr>
<tr><td>3</td><td>Viva-Voce /Oral</td><td>05 Marks</td><td>15 Marks</td></tr>
<tr><td>4</td><td>Total</td><td>10 Marks</td><td>40 Marks</td></tr>
</table>
</td></tr>
<tr><td>7</td><td>Project Work (PW)

RP-II

6 Credit
150 Marks

CA: 50%
EE: 50%</td><td>1. Student is required to submit “Activity Report” based on Grading Criteria of the course in the prescribed format.
2. Maximum number of attempts for each CA, during each semester: Single attempt only
3. Marks: 75 Marks
4. Grading Criteria:
<table>
<tr><td>SN</td><td>Desc</td><td>Marks</td></tr>
<tr><td>1</td><td>Seminar*</td><td>30</td></tr>
<tr><td>2</td><td>Research Paper Presentation**</td><td>30</td></tr>
<tr><td>3</td><td>Project Report</td><td>15</td></tr>
</table>
*To be conducted in Online/Off line mode at LSC.
** Journals/Conferences/ at LSC, in Online/Offline mode [This activity shall be organized by respective LSC in Online/Offline mode in case student didn’t get an opportunity for presentation at Journals/Conferences]</td><td>1. External and internal examiners shall assess each student based on:
a. Project Report submission by the student (Only by External Examiner) [20 Marks]
b. Project Presentation by the student [25 Marks]
c. Viva-Voce on Project Report [30 Marks]
2. Number of attempts: Till Valid Registration Period (VRP) only
3. Marks: 75 Marks
4. Duration: 180 minutes</td></tr>
</table>

<table>
<tr><th>SN</th><th>Type of Course</th><th colspan="2">Continuous Assessment (CA)</th><th>End Examination (EE)</th></tr>
<tr><td></td><td></td><td colspan="2"><table>
<tr><td rowspan="2">SN</td><td colspan="3">Evaluation of Project Work End Examination</td></tr>
<tr><td>Description</td><td>Internal Examiner</td><td>External Examiner</td></tr>
<tr><td>1</td><td>Project Report</td><td>-</td><td>20 Marks</td></tr>
<tr><td>2</td><td>Project Presentation</td><td>05 Marks</td><td>20 Marks</td></tr>
<tr><td>3</td><td>Viva-Voce /Oral</td><td>10 Marks</td><td>20 Marks</td></tr>
<tr><td></td><td>Total</td><td>15 Marks</td><td>60 Marks</td></tr>
</table></td><td></td></tr>
</table>

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Programme Project Report (PPR)

[Master of Arts in Hindi]

A.	**Name of the Programme**	**Master of Arts (M. A.) in Hindi**
B.	**Programme Mission and Objectives**	**Mission**: The M.A. Hindi Programme aims to develop understanding about basic concepts of Hindi literary writings, appreciation of Hindi literature, develop critical thinking among the learners and prepare them to explore solutions to real life concerns by pursuing further research. **Objectives**: The 'M.A. (Hindi)' Programme will • Apprise the learners with the history and tradition of Hindi language and literature, and inculcate the right skills and tools to understand, appreciate and critically analyze the body of literature. • Prepare the learners to understand the process of creative writing and hone appropriate skills and techniques to take up creative, media, script writing in Hindi and translation. • Acquaint with the linguistics, dialects, standard language, skills to use it for professional, and purposes, in context with the information communication technology. • Understand the varied types of literary discourses and creative writings, and are introduced to folk literature and folk traditions. ➢ Expose the learners to current trends in research, and Identify possible research areas in Hindi literature and language, and thus develop research vision.
C.	**Relevance of the programme with HEI's Mission and Goals :**	**The 'M.A. (Hindi)' Programme** is relevant with the objects of the YCMOU (as per the YCMOU Act) which would be fulfilled by implementing the proposed program (a) To provide through instruction, teaching and training and other educational opportunities, access to larger and larger segment of population, and in particular to the disadvantaged groups such as those living in remote and rural areas including working people, housewives and other adults who wish to upgrade or acquire knowledge through studies in various fields; [1(a)] (b) To strengthen and diversify the degrees, diploma and certificate courses at various educational levels, to fulfil the knowledge, skills and development needs of the individuals, institutions and society in general, by relating, particularly, the courses, to the needs of the employment and economic development of the state on the basis of its natural and human resources; [1(b)] (c) To promote acquisition of knowledge in a rapidly developing and changing society and to continually offer opportunity of upgrading knowledge, training and skills in the context of innovations, research and discovery in all field of

		human endeavor by developing educational network with the use of modern communication media and technologies appropriate for a learning society; [1(c)] (d) To provide an innovative system of University level education, flexible and open, in regard to the methods and pace of learning, combination of courses, eligibility for enrolment, age of entry, conduct of examinations and operation of the program, with a review to promote learning and encourage excellence in all fields of knowledge; [1(d)] (e) To contribute to the improvement of the education system in the state by providing a non-formal channel complementary to the formal system and encouraging transfer of credits and exchange of teaching staff by making a wide use of text and other software developed by the University; [1(e)] (f) To develop innovative, need based Vocational courses and establish industry, institution linkage for developing the society; [1(f)] (g) To provide through incidental and non-formal means, for continuing and extension of education in various cultural forms, arts, crafts and skills of the country, raising their quality and improving their availability to the people; [1(g)] (h) To provide for the counselling and guidance to its students; [1(j)] (i) To provide major part of its resources and direct efforts in designing, developing and offering need-based and relevant vocational courses. [1(l)]
D.	**Prospective target group of learners :**	● The Programme is targeted at the Hindi language knowing individuals interested in Hindi language and literature and having undergraduate degree in any stream. ● Individuals working in Hindi media, translation and creative writing field. ● Individuals wishing to opt for Hindi language and literature for competitive exams.
E.	**Appropriateness of program to be conducted in open and distance learning mode to acquire specific skill and competence :**	The theoretical nature of the program makes it appropriate for study in ODL mode.
F.	**Instructional design**	**Semester pattern**: This Programme has 4 semesters. Total Courses 23 (Sem I -06, Sem II -06, Sem III-06, Sem IV-05) and Some course is of 2-4 credits. Total 16 weeks/Semester for Teaching-Learning are planned during each semester. **Minimum Programme duration: 2 years** **Minimum number of face-to-face counseling sessions: 04 Per credit** (For each course of 2-4 credits duration of each counseling session shall be 01 Clock Hour) **Total Courses And Credits of Programme :** Total numbers of Courses - 23.

<table>
<tr><td></td><td></td><td>Some Course is of 2- 4 Credits.
SEM I :- 06
SEM II:- 06
SEM III :- 06
SEM IV:- 05
Required study efforts: Total 352 Hours study efforts (including face to face Teaching-Learning support and Self-Study) during each semester)
Medium of Instruction: Hindi
Attendance: attendance for weekly counselling sessions is expected
Course Pattern: Total Courses: 23 and Total Credits: 88</td></tr>
<tr><td>G.</td><td>Procedure for admissions, curriculum transaction and evaluation:</td><td>Admissions procedure: A customized “Online Annual Admission system” available at DU portal http://ycmou.digitaluniveristy.ac Online payment facility is made available using a credit card or debit card or internet banking or Unified Payment Interface (UPI) payment modes.
Admission Eligibility: Any Graduate of any recognized university.
Total Programme Fee:
FYMA/ Semester I & II : 8446/- and
SYMA/ Semester III & IV: 8468/-
Total ₹ 16,914/- for all 04 Semesters, which is duly approved by the university authorities.

Curriculum Transaction:
• 2-4 SLM Books are developed for each course.
• Total 04 Face-To-Face Counselling sessions per credit, each of 60 Minutes Duration, will be provided at respective study Centers.
• Curriculum update will be after every 5 years

Evaluation:
<table><tr><td></td><td>Yes or No</td><td>Weightage in overall assessment</td></tr><tr><td>Assignments</td><td>Yes</td><td>30 %</td></tr><tr><td>Term End Exam</td><td>Yes</td><td>70 %</td></tr><tr><td>Passing Percentage</td><td>Yes</td><td>40%</td></tr></table>
Reporting Semesters for certification: All the best performances of Semester 01 to 04 would be reported in the transcript or the Statement of Marks, separately for each semester, and at the successful completion of the Program in a consolidated one.</td></tr>
<tr><td>H.</td><td>Requirement of the laboratory support and library resources:</td><td>Language Lab facility is expected.
Laboratory requirement - NO
Library Resources – YES
Institutes/Colleges affiliated with conventional universities offering Hindi Courses/Programs will be recognized as a Study centres of this university for this programme. So, the requirement of library resources will be automatically ensured.</td></tr>
<tr><td>I.</td><td>Cost estimate of the program and the provisions:</td><td>Estimated development cost for 27 courses having 93 SLM books is about ₹ 60, 00, 000/- (Sixty Lakhs only)
The required budgetary provision for this development of SLM was made available and the development has been completed.</td></tr>
</table>

J.	**Quality assurance mechanism and expected program outcomes**	The University through the following measures ensures quality in the delivery of the program and its outcomes. 1. Monitoring of study centres to ensure that counselling is provided to students as per the schedule. 2. Students' feedback for effective dissemination of the content through SLMs, and online resource materials. 3. Continuous Assessment for student's progression. 4. Inviting students' feedback, responses through letters/ mails. 5. Examination is held and Result is declared within the stipulated time. The following key result areas will be closely monitored. i. Enrolment of student (Equated Access) ii. Equal weightage for each credit in student evaluation iii. Demonstrate in-depth knowledge of the subject, both in theory and application. iv. Placements/satisfaction of passing out students v. Administrative/stakeholder feedback **Expected Outcomes:** The learners would have an understanding of important basic concepts and principles of Hindi language and literature, and would be able to appreciate Hindi literary treasure, and acquire creative writing skills. The learners would develop interest in Hindi linguistics, research, preservation and documentation of art and heritage of composite culture at national and local level. The learners would be trained to contribute in the institutes of various states, as it is official language of some states. They would also be exposed to research studies in Hindi language and literature.

Programme Project Report (PPR)

[Master of Arts (M.A.) in Economics]

A.	**Name of the Programme**	**Master of Arts (M. A.) in Economics**
B.	**Programme Mission and Objectives**	**Mission:** To provide knowledge about various areas of studies in Economics and make them confident to integrate Economic theory and practice, and enable them to think critically and independently analyse the Economic activities of the state and nation. **Objectives**: ➢ To introduce the learners to the philosophy of Economics and develop understanding of important basic concepts and principles of Economics and their relevance in life. ➢ To expose the learners to the current trends in economics, such as behavioural, environmental economics, and econometrics and thus enable them to integrate theory with practice. ➢ Expose the learners to the current trends in research, and identify possible research areas in the specific domain and conduct independent and collaborative studies on significant socio-economic issues. ➢ To expand the horizon of their knowledge, and thus make them employable and contribute in the development of the state and the nation.
C.	**Relevance of the programme with HEI's Mission and Goals :**	**M. A. Economics program is relevant with the following objectives of the university:** Through this Programme, the university provides vertical mobility to the students pursuing higher education. The university believes that the professional and social experience of the learners can be utilized in an effective way to advance learning at the postgraduate level. The university aims at providing quality education at an affordable cost, and the postgraduate study in the respective subjects would prove useful in turning trained manpower for the development of the state and in turn the development of the nation. **The implementation of the proposed programme would fulfil the Objectives of the YCMOU (as per the YCMOU Act)** (a) To provide through instruction, teaching and training and other educational opportunities, access to larger and larger segment of population, and in particular to the disadvantaged groups such as those living in remote and rural areas including working people, housewives and other adults who wish to upgrade or acquire knowledge through studies in various fields; [1(a)] (b) To strengthen and diversify the degrees, diploma and certificate courses at various educational levels, to fulfil the knowledge, skills and development needs of the individuals,

		institutions and society in general, by relating, particularly, the courses, to the needs of the employment and economic development of the state on the basis of its natural and human resources; [1(b)] (c) To promote acquisition of knowledge in a rapidly developing and changing society and to continually offer opportunity of upgrading knowledge, training and skills in the context of innovations, research and discovery in all fields of human endeavour by developing educational network with the use of modern communication media and technologies appropriate for a learning society; [1(c)] (d) To provide an innovative system of University level education, flexible and open, in regard to the methods and pace of learning, combination of courses, eligibility for enrolment, age of entry, conduct of examinations and operation of the program, with a review to promote learning and encourage excellence in all fields of knowledge; [1(d)] (e) To contribute to the improvement of the education system in the state by providing a non-formal channel complementary to the formal system and encouraging transfer of credits and exchange of teaching staff by making a wide use of text and other software developed by the University; [1(e)] (f) To develop innovative, need based Vocational courses and establish industry, institution linkage for developing the society; [1(f)] (g) To provide through incidental and non-formal means, for continuing and extension of education in various cultural forms, arts, crafts and skills of the country, raising their quality and improving their availability to the people; [1(g)] (h) To provide for the counselling and guidance to its students; [1(j)] (i) To provide a major part of its resources and direct efforts in designing, developing and offering need-based and relevant vocational courses. [1(l)]
D.	**Prospective target group of learners :**	The learners with an undergraduate degree in any discipline with an interest and ready to explore career opportunities in the field of economics.
E.	**Appropriateness of program to be conducted in open and distance learning mode to acquire specific skill and competence :**	The theoretical nature of the program makes it appropriate for study in Open and Distance Learning (ODL) mode.
F.	**Instructional design**	**Semester pattern**: Having 04 semesters. **Minimum Program Duration: 02 Years** Maximum Program Duration : 04 Years **Minimum number of face-to-face counselling sessions: 04 Per credit**

<table>
<tr><td></td><td></td><td>(Duration of each counselling session shall be of 01 Clock Hour)

Total Courses and Credits of Programme :
Total Courses: 23 / Total Credits: 88
Semester_I_06
Semester_II_06
Semester _III_06
Semester_IV_05

Course Pattern: 19 Courses of 04 Credits each, 03 Courses of 2 credits each, and 01 Course of 06 Credits (Research Project)

Required study efforts:
Total 16 weeks per Semester for Teaching-Learning are planned during each semester.
Thus, total 352 Hours study efforts (including face to face Teaching-Learning support and Self-Study) during each semester.

Medium of Instruction: Marathi
Attendance: attendance for weekly counselling sessions is expected</td></tr>
<tr><td>G.</td><td>Procedure for admissions, curriculum transaction and evaluation:</td><td>Admissions procedure: A customized “Online Annual Admission system” available at DU portal http://ycmou.digitaluniveristy.ac
Online payment facility is made available using a credit card or debit card or internet banking or Unified Payment Interface (UPI) payment modes.
Admission Eligibility: Any Graduate of any recognized university.
Total Programme Fee:
FYMA/ Semester I & II : 8446/- and
SYMA/ Semester III & IV: 8468/-
Total ₹ 16,894/- for all 04 Semesters, which is duly approved by the university authorities.

Curriculum Transaction:
• 2-4 SLM Books are developed for each course.
• Total 04 Face-To-Face Counselling sessions per credit, each of 60 Minutes Duration, will be provided at respective study Centers.
• Curriculum update will be after every 5 years

Evaluation:
<table>
<tr><td></td><td>Yes or No</td><td>Weightage in overall assessment</td></tr>
<tr><td>Assignments</td><td>Yes</td><td>30 %</td></tr>
<tr><td>Term End Exam</td><td>Yes</td><td>70 %</td></tr>
<tr><td>Passing Percentage</td><td>Yes</td><td>40%</td></tr>
</table>
</td></tr>
</table>

		Reporting Semesters for certification: All the best performances of Semester 01 to 04 would be reported in the transcript or the Statement of Marks, separately for each semester, and at the successful completion of the Program in a consolidated one.
H.	**Requirement of the laboratory support and library resources:**	Laboratory requirement - NO Library Resources – YES Institutes/Colleges affiliated with conventional universities offering Economics Courses/Programs will be recognized as a Study centres of this university for this programme. So, the requirement of library resources will be automatically ensured.
I.	**Cost estimate of the program and the provisions:**	Estimated development cost for 27 courses having 93 SLM books is about **₹ 60, 00, 000/- (Sixty Lakhs only)** The required budgetary provision for this development of SLM was made available and the development has been completed.
J.	**Quality assurance mechanism and expected program outcomes**	The University through the following measures ensures quality in the delivery of the program and its outcomes. 1. Monitoring of study centres to ensure that counselling is provided to students as per the schedule. 2. Students' feedback for effective dissemination of the content through SLMs, and online resource materials. 3. Continuous Assessment for student's progression. 4. Inviting students' feedback, responses through letters/ mails. 5. Examination is held and Result is declared within the stipulated time. The following key result areas will be closely monitored. i. Enrolment of student (Equated Access) ii. Equal weightage for each credit in student evaluation iii. Demonstrate in-depth knowledge of the subject, both in theory and application. iv. Placements/satisfaction of passing out students v. Administrative/stakeholder feedback **Expected Outcomes:** The learners would have developed clear understanding of important basic concepts and principles of Economics; they would have developed independent thinking; they would be exposed to the current trends in research in economics, and would be able to integrate theory with practice. Thus the horizon of their knowledge would be expanded thus they would be employable or take their own vocation and contribute in the development of the state and the nation.

Programme Project Report (PPR)

[M. A. Marathi]

A.	**Name of the Programme**	**Master of Arts (M. A.) in Marathi**
B.	**Mission and Objectives of the Programme**	**Mission :** To develop the knowledge, right attitude and skills of the learners so that their learning will be holistic and relevant to a globalized context. It will create a distinct vision of excellence in Marathi language and literature, and interest in pursuing further research. **Objectives** ➢ To develop an in-depth understanding of the history of Marathi literature and language, ability to appreciate and critically approach to the body of literature in Marathi language. ➢ To acquaint the learners with linguistics, and various dialects, develop professional writing techniques and skills, and build capacity in creative writing and translation. ➢ To introduce various streams in Marathi literature, such as folk literature and its folk traditions, and literature of the marginalised. ➢ To develop a critical and analytical thinking, and expose to the research techniques and capacity to assess the need for research in Marathi literature and language and thus develop research perspective.
C.	**Relevance of the programme with HEI's Mission and Goals :**	**The 'M.A. (Marathi)' Programme** is relevant with the objects of the YCMOU (as per the YCMOU Act) which would be fulfilled by implementing the proposed program (a) To provide through instruction, teaching and training and other educational opportunities, access to larger and larger segment of population, and in particular to the disadvantaged groups such as those living in remote and rural areas including working people, housewives and other adults who wish to upgrade or acquire knowledge through studies in various fields; [1(a)] (b) To strengthen and diversify the degrees, diploma and certificate courses at various educational levels, to fulfil the knowledge, skills and development needs of the individuals, institutions and society in general, by relating, particularly, the courses, to the needs of the employment and economic development of the state on the basis of its natural and human resources; [1(b)] (c) To promote acquisition of knowledge in a rapidly developing and changing society and to continually offer opportunity of upgrading knowledge, training and skills in the context of innovations, research and discovery in all field of human endeavour by developing educational network with the use of modern communication media and technologies appropriate for a learning society; [1(c)] (d) To provide an innovative system of University level education, flexible and open, in regard to the methods and pace of learning, combination of courses, eligibility for enrolment, age of entry, conduct of examinations and operation of the program,

		with a review to promote learning and encourage excellence in all fields of knowledge; [1(d)] (e) To contribute to the improvement of the education system in the state by providing a non-formal channel complementary to the formal system and encouraging transfer of credits and exchange of teaching staff by making a wide use of text and other software developed by the University; [1(e)] (f) To develop innovative, need based Vocational courses and establish industry, institution linkage for developing the society; [1(f)] (g) To provide through incidental and non-formal means, for continuing and extension of education in various cultural forms, arts, crafts and skills of the country, raising their quality and improving their availability to the people; [1(g)] (h) To provide for the counselling and guidance to its students; [1(j)] (i) To provide major part of its resources and direct efforts in designing, developing and offering need-based and relevant vocational courses. [1(l)]
D.	**Prospective target group of learners :**	The learners with an undergraduate degree in any discipline with an interest in, and ready to explore career opportunities in the field of administration.
E.	**Appropriateness of program to be conducted in open and distance learning mode to acquire specific skill and competence :**	The theoretical nature of the program makes it appropriate for study in Open and Distance Learning (ODL) mode.
F.	**Instructional design**	**Semester pattern**: Having 04 semesters. **Minimum Program Duration: 02 Years** Maximum Program Duration : 04 Years **Minimum number of face-to-face counselling sessions: 04 Per credit** (Duration of each counselling session shall be of 01 Clock Hour) **Total Courses and Credits of Programme :** Total Courses: 23 / Total Credits: 88 Semester_I_06, Semester_II_06, Semester_III_06, Semester_IV_05 **Course Pattern:** 19 Courses of 04 Credits each, 03 Courses of 2 credits each, and 01 Course of 06 Credits (Research Project) **Required study efforts**: Total 16 weeks per Semester for Teaching-Learning are planned during each semester. Thus, total 352 Hours study efforts (including face to face Teaching-Learning support and Self-Study) during each semester. **Medium of Instruction**: **Marathi** **Attendance**: attendance for weekly counselling sessions is

<table>
<tr><td></td><td></td><td>expected</td></tr>
<tr><td>G.</td><td>Procedure for admissions, curriculum transaction and evaluation:</td><td>Admissions procedure: A customized “Online Annual Admission system” available at DU portal http://ycmou.digitaluniveristy.ac
Online payment facility is made available using a credit card or debit card or internet banking or Unified Payment Interface (UPI) payment modes.
Admission Eligibility: Any Graduate of any recognized university.
Total Programme Fee:
FYMA/ Semester I& II : 8436/- and SYMA/SemesterIII & IV: 8458/-
Total ₹ 16,894/- for all 04 Semesters, which is duly approved by the university authorities.
Curriculum Transaction:
2-4 SLM Books are developed for each course.
Total 04 Face-To-Face Counselling sessions per credit, each of 60 Minutes Duration, will be provided at respective study Centers.
Curriculum update will be after every 5 years
Evaluation:<table><tr><td></td><td>Yes or No</td><td>Weightage in overall assessment</td></tr><tr><td>Assignments</td><td>Yes</td><td>30 %</td></tr><tr><td>Term End Exam</td><td>Yes</td><td>70 %</td></tr><tr><td>Passing Percentage</td><td>Yes</td><td>40%</td></tr></table>Reporting Semesters for certification: All the best performances of Semester 01 to 04 would be reported in the transcript or the Statement of Marks, separately for each semester, and at the successful completion of the Program in a consolidated one.</td></tr>
<tr><td>H.</td><td>Requirement of the laboratory support and library resources:</td><td>Laboratory requirement - NO
Library Resources – YES
Institutes/Colleges affiliated with conventional universities offering Public Administration or Political Science Courses/Programs will be recognized as a Study centres of this university for this programme. So, the requirement of library resources will be automatically ensured.</td></tr>
<tr><td>I.</td><td>Cost estimate of the program and the provisions:</td><td>Estimated development cost for 27 courses having 93 SLM books is about ₹ 60, 00, 000/- (Sixty Lakhs only)
The required budgetary provision for this development of SLM was made available and the development has been completed.</td></tr>
<tr><td>J.</td><td>Quality assurance mechanism and expected program outcomes</td><td>The University through the following measures ensures quality in the delivery of the program and its outcomes.<ol start="6">
Monitoring of study centres to ensure that counselling is provided to students as per the schedule.
Students’ feedback for effective dissemination of the content through SLMs, and online resource materials.
Continuous Assessment for student’s progression.
Inviting students’ feedback, responses through letters/ mails.
Examination is held and Result is declared within the stipulated time.</td></tr>
</table>

		The following key result areas will be closely monitored. vi. Enrolment of student (Equated Access) vii. Equal weightage for each credit in student evaluation viii. Demonstrate in-depth knowledge of the subject, both in theory and application. ix. Placements/satisfaction of passing out students x. Administrative/stakeholder feedback **Expected Outcomes:** The learner would have thorough understanding of the history of Marathi literature and language, ability to appreciate and critically approach to the body of literature in Marathi language. He would be acquainted with linguistics, and various dialects, developed professional writing techniques and skills, and have capacity in creative writing and translation. He would have knowledge of various streams in Marathi literature, such as folk literature and its folk traditions, and literature of the marginalised. He would have developed critical and analytical thinking, and exposure to research techniques and capacity to assess the need for research in Marathi literature and language and thus develop research vision.

Programme Project Report (PPR)

[M. A. Public Administration]

A.	**Name of the Programme**	**Master of Arts (M. A.) in Public Administration**
B.	**Programme Mission and Objectives**	**Mission :** **To develop a knowledgeable, transparent and committed workforce for good governance in the nation building.** **Objectives** ➢ To prepare pre- and in-service learners for a variety of Public Sector roles, provide knowledge and skills about the public management policies and systems, and thus build capacity to integrate theory and practice of public administration. ➢ To inculcate constitutional and democratic values and contribute in building harmonious society, and to sensitize the leadership so that they would have an informed intervention in the governance. ➢ To inculcate administrative ethics and prepare responsible civil servants who would be aware of the issues and concerns of the public thus help reduce corruption in the administration. ➢ To enhance analytical skills and research capabilities to conduct independent and collaborative studies on socio-political issues and public policy. ➢ Expose the learners to the current trends in research, and identify possible research areas in the specific domain and thus develop research perspective.
C.	**Relevance of the programme with HEI's Mission and Goals :**	**M. A. Public Administration program is relevant with the following objectives of the university:** Through this Programme, the university provides vertical mobility to the students pursuing higher education. The university believes that the professional and social experience of the learners can be utilized in an effective way to advance learning at the postgraduate level. The university aims at providing quality education at an affordable cost, and the postgraduate study in the respective subjects would prove useful in turning trained manpower for the development of the state and in turn the development of the nation. **The implementation of the proposed programme would fulfil the Objectives of the YCMOU (as per the YCMOU Act)** (a) To provide through instruction, teaching and training and other educational opportunities, access to larger and larger segment of population, and in particular to the disadvantaged groups such as those living in remote and rural areas including working people, housewives and other adults who wish to upgrade or acquire knowledge through studies in various fields; [1(a)]

		(b) To strengthen and diversify the degrees, diploma and certificate courses at various educational levels, to fulfil the knowledge, skills and development needs of the individuals, institutions and society in general, by relating, particularly, the courses, to the needs of the employment and economic development of the state on the basis of its natural and human resources; [1(b)] (c) To promote acquisition of knowledge in a rapidly developing and changing society and to continually offer opportunity of upgrading knowledge, training and skills in the context of innovations, research and discovery in all fields of human endeavour by developing educational network with the use of modern communication media and technologies appropriate for a learning society; [1(c)] (d) To provide an innovative system of University level education, flexible and open, in regard to the methods and pace of learning, combination of courses, eligibility for enrolment, age of entry, conduct of examinations and operation of the program, with a review to promote learning and encourage excellence in all fields of knowledge; [1(d)] (e) To contribute to the improvement of the education system in the state by providing a non-formal channel complementary to the formal system and encouraging transfer of credits and exchange of teaching staff by making a wide use of text and other software developed by the University; [1(e)] (f) To develop innovative, need based Vocational courses and establish industry, institution linkage for developing the society; [1(f)] (g) To provide through incidental and non-formal means, for continuing and extension of education in various cultural forms, arts, crafts and skills of the country, raising their quality and improving their availability to the people; [1(g)] (h) To provide for the counselling and guidance to its students; [1(j)] (i) To provide a major part of its resources and direct efforts in designing, developing and offering need-based and relevant vocational courses. [1(l)]
D.	**Prospective target group of learners :**	The learners with an undergraduate degree in any discipline with an interest in, and ready to explore career opportunities in the field of administration.
E.	**Appropriateness of program to be conducted in open and distance learning mode to acquire specific skill and competence :**	The theoretical nature of the program makes it appropriate for study in Open and Distance Learning (ODL) mode.
F.	**Instructional design**	**Semester pattern**: Having 04 semesters. **Minimum Program Duration: 02 Years** Maximum Program Duration : 04 Years **Minimum number of face-to-face counselling sessions: 04 Per credit** (Duration of each counselling session shall be of 01 Clock Hour)

		Total Courses and Credits of Programme : Total Courses: 23 / Total Credits: 88 Semester_I_06, Semester_II_06, Semester _III_06, Semester_IV_05 **Course Pattern:** 19 Courses of 04 Credits each, 03 Courses of 2 credits each, and 01 Course of 06 Credits (Research Project) **Required study efforts**: Total 16 weeks per Semester for Teaching-Learning are planned during each semester. Thus, total 352 Hours study efforts (including face to face Teaching-Learning support and Self-Study) during each semester. **Medium of Instruction**: **Marathi** **Attendance**: attendance for weekly counselling sessions is expected
G.	**Procedure for admissions, curriculum transaction and evaluation:**	**Admissions procedure**: A customized "Online Annual Admission system" available at DU portal http://ycmou.digitaluniveristy.ac Online payment facility is made available using a credit card or debit card or internet banking or Unified Payment Interface (UPI) payment modes. **Admission Eligibility**: Any Graduate of any recognized university. **Total Program Fee**: FYMA/ Semester I & II : 8446/- and SYMA/ Semester III & IV: 8468/- Total ₹ 16,914/- for all 04 Semesters, which is duly approved by the university authorities. **Curriculum Transaction**: • 2-4 SLM Books are developed for each course. • Total 04 Face-To-Face Counselling sessions per credit, each of 60 Minutes Duration, will be provided at respective study Centers. • Curriculum update will be after every 5 years **Evaluation**: | | Yes or No | Weightage in overall assessment | | Assignments | Yes | 30 % | | Term End Exam | Yes | 70 % | | Passing Percentage | Yes | 40% | **Reporting Semesters for certification:** All the best performances of Semester 01 to 04 would be reported in the transcript or the Statement of Marks, separately for each semester, and at the successful completion of the Program in a consolidated one

H.	**Requirement of the laboratory support and library resources:**	Laboratory requirement - NO Library Resources – YES Institutes/Colleges affiliated with conventional universities offering Public Administration or Political Science Courses/Programs will be recognized as a Study centres of this university for this programme. So, the requirement of library resources will be automatically ensured.
I.	**Cost estimate of the program and the provisions:**	Estimated development cost for 27 courses having 93 SLM books is about **₹ 60, 00, 000/- (Sixty Lakhs only)** The required budgetary provision for this development of SLM was made available and the development has been completed.
J.	**Quality assurance mechanism and expected program outcomes**	The University through the following measures ensures quality in the delivery of the program and its outcomes. 1. Monitoring of study centres to ensure that counselling is provided to students as per the schedule. 2. Students' feedback for effective dissemination of the content through SLMs, and online resource materials. 3. Continuous Assessment for student's progression. 4. Inviting students' feedback, responses through letters/ mails. 5. Examination is held and Result is declared within the stipulated time. The following key result areas will be closely monitored. i. Enrolment of student (Equated Access) ii. Equal weightage for each credit in student evaluation iii. Demonstrate in-depth knowledge of the subject, both in theory and application. iv. Placements/satisfaction of passing out students v. Administrative/stakeholder feedback **Expected Outcomes:** ➢ The learners would be ready for the variety of public sector roles, have thorough knowledge and skills about the public management policies and systems, and thus have capacity to integrate theory and practice of public administration. ➢ They would have understanding and knowledge of constitutional and democratic values and would contribute in building harmonious society. ➢ They would be sensitive to perform leadership roles, and have an informed intervention in the governance. ➢ They would be equipped with administrative ethics and would be future responsible civil servants, and would be aware of the issues and concerns of the public thus help reduce corruption in the administration.

Programme Project Report (PPR)

[Master of Arts in Urdu]

A.	**Name of the Programme**	**Master of Arts (M. A.) in Urdu**
B.	**Programme Mission and Objectives**	Mission To develop understanding among the learners about the body of Urdu language and literature, develop critical and analytical thinking, provide translation skills, prepare for media and creative writing, and thus develop trained work force to contribute in the development of the state and the nation. Programme Objectives ➢ To develop the understanding of important basic concepts and principles of Urdu language and literature, and to motivate the learners to appreciate Urdu literary treasure, and acquire creative writing skills. ➢ To develop interest of the students about the Urdu Linguistics, and to assist in their research, preservation and documentation of art and heritage of composite culture at national and local level. ➢ To provide trained human resource to the institutes of various states, as it is official language of some states. ➢ To expose the learners to research studies in Urdu language and literature. ➢ Expose the learners to the current trends in research, and identify possible research areas in the specific domain and thus develop research perspective.
C.	**Relevance of the programme with HEI's Mission and Goals :**	**M. A. Urdu program is relevant with the following objectives of the university:** The YCMOU aims to impart quality education to meet national and global challenges, to blend theoretical knowledge with practical skills, to encourage the faculty to pursue academic excellence through high quality research and publication, to promote the use of new technologies in teaching and research, to inculcate right values among students while promoting leadership qualities, and to produce socially sensitive citizens, and thus hasten the process of creating a knowledge society. **The implementation of the proposed programme would fulfil the Objectives of the YCMOU (as per the YCMOU Act)** (a) To provide through instruction, teaching and training and other educational opportunities, access to larger and larger segment of population, and in particular to the disadvantaged groups such as those living in remote and rural areas including working people, housewives and other adults who wish to upgrade or acquire knowledge through studies in various fields; [1(a)] (b) To strengthen and diversify the degrees, diploma and certificate courses at various educational levels, to fulfil the knowledge, skills and development needs of the individuals, institutions and society in general, by relating, particularly, the courses, to the needs of the employment and economic

		development of the state on the basis of its natural and human resources; [1(b)] (c) To promote acquisition of knowledge in a rapidly developing and changing society and to continually offer opportunity of upgrading knowledge, training and skills in the context of innovations, research and discovery in all fields of human endeavour by developing educational network with the use of modern communication media and technologies appropriate for a learning society; [1(c)] (d) To provide an innovative system of University level education, flexible and open, in regard to the methods and pace of learning, combination of courses, eligibility for enrolment, age of entry, conduct of examinations and operation of the program, with a review to promote learning and encourage excellence in all fields of knowledge; [1(d)] (e) To contribute to the improvement of the education system in the state by providing a non-formal channel complementary to the formal system and encouraging transfer of credits and exchange of teaching staff by making a wide use of text and other software developed by the University; [1(e)] (f) To develop innovative, need based Vocational courses and establish industry, institution linkage for developing the society; [1(f)] (g) To provide through incidental and non-formal means, for continuing and extension of education in various cultural forms, arts, crafts and skills of the country, raising their quality and improving their availability to the people; [1(g)] (h) To provide for the counselling and guidance to its students; [1(j)] (i) To provide a major part of its resources and direct efforts in designing, developing and offering need-based and relevant vocational courses. [1(l)]
D.	**Prospective target group of learners :**	• The programme is targeted at the Urdu language knowing individuals interested in Urdu language and literature and having undergraduate degree in any stream. • Individuals working in Urdu media, translation and creative writing field. • Individuals wishing to opt for Urdu language and literature for competitive exams.
E.	**Appropriateness of program to be conducted in open and distance learning mode to acquire specific skill and competence :**	The theoretical nature of the program makes it appropriate for study in Open and Distance Learning (ODL) mode.
F.	**Instructional design**	**Semester pattern**: Having 04 semesters. **Minimum Program Duration: 02 Years** Maximum Program Duration : 04 Years **Minimum number of face-to-face counselling sessions: 04 Per credit** (Duration of each counselling session shall be of 01 Clock Hour) **Total Courses and Credits of Program :** Total Courses: 24 / Total Credits: 88 Semester I 07 Courses

<table>
<tr><td></td><td></td><td>Semester II 06 Courses
Semester III 06 Courses
Semester IV 05 Courses

Course Pattern: 19 Courses of 04 Credits each, 03 Courses of 2 credits each, and 01 Course of 06 Credits (Research Project)

Required study efforts:
Total 16 weeks per Semester for Teaching-Learning are planned during each semester.
Thus, total 352 Hours study efforts (including face to face Teaching-Learning support and Self-Study) during each semester.

Medium of Instruction: Urdu
Attendance: attendance for weekly counselling sessions is expected</td></tr>
<tr><td>G.</td><td>Procedure for admissions, curriculum transaction and evaluation:</td><td>Admissions procedure: A customized “Online Annual Admission system” available at DU portal http://ycmou.digitaluniveristy.ac
Online payment facility is made available using a credit card or debit card or internet banking or Unified Payment Interface (UPI) payment modes.
Admission Eligibility: Any Graduate of any recognized university.
Total Programme Fee:
FYMA/ Semester I & II : 8446/- and
SYMA/ Semester III & IV: 8468/-
Total ₹ 16,914/- for all 04 Semesters, which is duly approved by the university authorities.

Curriculum Transaction:
• 2-4 SLM Books are developed for each course.
• Total 04 Face-To-Face Counselling sessions per credit, each of 60 Minutes Duration, will be provided at respective study Centers.
• Curriculum update will be after every 5 years

Evaluation:
<table>
<tr><td></td><td>Yes or No</td><td>Weightage in overall assessment</td></tr>
<tr><td>Assignments</td><td>Yes</td><td>30 %</td></tr>
<tr><td>Term End Exam</td><td>Yes</td><td>70 %</td></tr>
<tr><td>Passing Percentage</td><td>Yes</td><td>40%</td></tr>
</table>
Reporting Semesters for certification: All the best performances of Semester 01 to 04 would be reported in the transcript or the Statement of Marks, separately for each semester, and at the successful completion of the Program in a consolidated one.</td></tr>
<tr><td>H.</td><td>Requirement of the laboratory support and library resources:</td><td>Language Lab facility is expected.
Laboratory requirement - NO
Library Resources – YES
Institutes/Colleges affiliated with conventional universities offering Urdu Courses/Programs will be recognized as a Study centres of this university for this programme. So, the requirement of library resources will be automatically ensured.</td></tr>
</table>

I.	**Cost estimate of the program and the provisions:**	Estimated development cost for 27 courses having 93 SLM books is about **₹ 60, 00, 000/- (Sixty Lakhs only)** The required budgetary provision for this development of SLM was made available and the development has been completed.
J.	**Quality assurance mechanism and expected program outcomes**	The University through the following measures ensures quality in the delivery of the program and its outcomes. 1. Monitoring of study centres to ensure that counselling is provided to students as per the schedule. 2. Students' feedback for effective dissemination of the content through SLMs, and online resource materials. 3. Continuous Assessment for student's progression. 4. Inviting students' feedback, responses through letters/ mails. 5. Examination is held and Result is declared within the stipulated time. The following key result areas will be closely monitored. i. Enrolment of student (Equated Access) ii. Equal weightage for each credit in student evaluation iii. Demonstrate in-depth knowledge of the subject, both in theory and application. iv. Placements/satisfaction of passing out students v. Administrative/stakeholder feedback **Expected Outcomes:** The learners would have an understanding of important basic concepts and principles of Urdu language and literature, and would be able to appreciate Urdu literary treasure, and acquire creative writing skills. The learners would develop interest in Urdu linguistics, research, preservation and documentation of art and heritage of composite culture at national and local level. The learners would be trained to contribute in the institutes of various states, as it is official language of some states. They would also be exposed to research studies in Urdu language and literature.

DEB-UGC application for Programme Approval for AY 2025-26

School of Sciences, YCMOU, Nashik
(Formerly School of Architecture, Science and Technology)

Programme Project Report (PPR)
UGV04: B.Sc. (Honours) (Botany) {2025 Pattern}

A. **Programme Project Report (PPR)**

Name of Programme: 4 Year Bachelor of Science (Honours) (Botany)		
a	Programme's mission & objectives	**Mission**: The "Bachelor of Science (Honours)" is an innovative programme based on a number of core, elective and skill courses in Botany. Upon graduation, the learners will be able to understand and appreciate the impact of "Botany" in day-to-day life. Further, the learners will be exposed to the current trends in research about "Botany". The mission is to empowering learners to confidently tackle and analyse complex scientific challenges with ease. This program aims to cultivate strong analytical skills to prepare learners to excel in the field of Botany. The program provides a comprehensive education in both theoretical and experimental Botany. Learners will engage in hands-on laboratory activities and immersive field projects or internships, ensuring they acquire not only fundamental knowledge but also practical skills vital for success in the scientific community. **Objectives**: The main objectives for offering this programme, are • Interdisciplinary Competence: Equip students with a strong foundation in Life Sciences while fostering interdisciplinary integration across domains such as Botany, Zoology, Microbiology, Environmental Science, and Biotechnology. • Comprehensive Understanding of Life Sciences: Facilitate conceptual clarity in major subjects such as Morphology, Anatomy, Genetics, Physiology, Cell Biology, Evolution, and Ecology, Bioinformatics etc. • Scientific Problem-Solving Skills: Train students to identify, analyze, and solve complex biological problems using scientific methods and critical thinking. • Laboratory and Technical Proficiency: Build hands-on skills in laboratory techniques essential to the life sciences, including microscopy, spectroscopy, molecular biology, and biochemical analysis. • Research and Innovation Aptitude: Expose students to research design, hypothesis testing, data analysis, and scientific writing through collaborative and independent studies. • Communication and Collaboration: Cultivate the ability to effectively communicate scientific ideas, findings, and arguments through oral

		presentations, technical writing, posters, and digital media. • Ethical and Social Responsibility: Instill ethical values, academic integrity, and awareness of biosafety, environmental stewardship, and the societal impacts of scientific advancements. • Career Preparedness and Adaptability: Prepare students for diverse pathways including higher education, research, teaching, industry, government services, and entrepreneurship. • Adaptability and Future-Readiness in Life Sciences: Nurture adaptability by imparting a versatile skill set aligned with emerging trends in life sciences, including bioinformatics, sustainability, and biotech innovation. • Leadership and Collaboration: To develop leadership qualities and the ability to work collaboratively in multidisciplinary teams to address complex challenges. • Awareness of Contemporary Issues: To create awareness of contemporary scientific issues, including environmental sustainability, emerging technologies, and societal relevance.
b	Relevance of the Programme with HEI's Mission and Goals	Objects of the YCMOU (as per the YCMOU Act) which would be fulfilled by implementing the proposed program (a) To provide through instruction, teaching and training and other educational opportunities, access to larger and larger segment of population, and in particular to the disadvantaged groups such as those living in remote and rural areas including working people, housewives and other adults who wish to upgrade or acquire knowledge through studies in various fields; [1(a)] (b) To strengthen and diversify the degrees, diploma and certificate courses at various educational levels, to fulfill the knowledge, skills and development needs of the individuals, institutions and society in general, by relating, particularly, the courses, to the needs of the employment and economic development of the state on the basis of its natural and human resources; [1(b)] (c)To promote acquisition of knowledge in a rapidly developing and changing society and to continually offer opportunity of upgrading knowledge, training and skills in the context of innovations, research and discovery in all field of human endeavor by developing educational network with the use of modern communication media and

<table>
<tr><td></td><td></td><td>technologies appropriate for a learning society; [1(c)]

(d) To provide an innovative system of University level education, flexible and open, in regard to the methods and pace of learning, combination of courses, eligibility for enrolment, age of entry, conduct of examinations and operation of the program, with a review to promote learning and encourage excellence in all fields of knowledge; [1(d)]

(e) To contribute to the improvement of the education system in the state by providing a non-formal channel complementary to the formal system and encouraging transfer of credits and exchange of teaching staff by making a wide use of text and other software developed by the University; [1(e)]

(f)To develop innovative, need based Vocational courses and establish industry, institution linkage for developing the society; [1(f)]

(g) To provide through incidental and non-formal means, for continuing and extension of education in various cultural forms, arts, crafts and skills of the country, raising their quality and improving their availability to the people; [1(g)]

(h)To provide for the counseling and guidance to its learners; [1(j)]

(i)To provide major part of its resources and direct efforts in designing, developing and offering need-based and relevant vocational courses. [1(l)]</td></tr>
<tr><td>c</td><td>Nature of prospective target group of learners</td><td>12th / (10+2)th / Level 4.0 examination conducted by Maharashtra State Board of Secondary and Higher Secondary Education/CBSE/ ISC/NIOS or equivalent examinations by any Other State or any other recognized Board with Science Subjects Pass, including English and Biology/ (Physics, Chemistry & Optional Course) or Equivalent pass

OR

Higher Secondary School Certificate (10+2) Examination with English and any of the following + 2 Level HSC Vocational (MCVC) Group Pass

<table><tr><td>Horticulture (KA, KB, KC)</td></tr><tr><td>Crop Science (LA, LB, LC)</td></tr><tr><td>Catering and Food Products Technology (SA, SB, SC)</td></tr><tr><td>Child, Old Age and Health care services (QA, QB, QC)</td></tr></table></td></tr>
</table>

		Although similar UG Programme are offered by conventional institutes, the conventional educational system offers very little freedom to learners as regards when, where, and how to learn. The proposed programme aims to provide this freedom to learners to the maximum possible extent.
d	Appropriateness of programme to be conducted in Open and Distance Learning mode to acquire specific skills and competence Specify the expected learning outcomes in terms of: 1. Knowledge Attainment: 2. Skills and Competencies: Compliances of academic, professional & occupational standards:	The proposed programme is designed in adherence to the principles of National Education Policy (NEP2020) to acquire knowledge and skills with valuable experiences through VSC, SEC, AEC, VEC, IKS, hands-on activities, projects, internships and much more. This aims to provide relevant skills as needed by the working professional to identify and solve challenging problems in Botany, thus contributing to the ever-increasing demands of society and industry. The programme helps to develop scientific tempers and attitudes, which in turn can prove beneficial for society since scientific developments can make a nation or society grow at a rapid pace. After studying this programme, learners will be better equipped to learn and have a deep understanding of key Botany concepts, principles, and theories relevant to the field of Botany, and are prepared to take on leadership roles in botany, governmental agencies, research institutions, and industries related to Botany. This programme uses the Open and Distance (ODL) mode of education in compliance with the objective 'reach to unreached' by offering: Theory, Practical, Term-work, Field Project/OJT, courses. The teaching-learning component is offered as face-to-face counseling along with full practical and project-work activities by qualified and experienced teacher/ mentors/experts at a recognized Learner Support Center (LSC), along with continuous assessment, and offline materials and resources in printed book format or soft copy format. The UGC recently introduced a 'Virtual Laboratory' approach for practical courses. This university is currently working on implementing this for the proposed laboratory activities in science courses. Additionally, this programme adheres all of the prevalent academic norms and standards of the UGC-DEB. Hence, this programme is appropriate to conduct in open and distance learning modes to provide an opportunity for those aspirants who cannot take traditional education but want to improve their existing science skills and/or to acquire specified skills and competencies.
e	Instructional Design **1.** Curriculum Design	This B.Sc. (Honours) programme for undergraduates is well structured based on the NEP 2020 framework. The entire curriculum is well organized and thoughtfully designed, featuring an updated syllabus. The four-year B.Sc.

(*Outcome of Expert Committee meeting; Program Structure: specify the theory, practical, fieldwork, project, etc components*):

2. Total Credit Points (*including course wise*):
3. Detailed Syllabi:
4. Duration of the program **(*Minimum & Maximum*):**
5. Medium of Instruction:
6. Type of Program **(*General/Technical/ Professional*):**
7. Faculty and Support Staff:
8. Instructional Design & Delivery Mechanism **(*Media to be used -print, audio, video, online, computer aided, web based, etc.*)**

(Honours) program consists of 176 credits distributed over eight semesters, with learners required to complete 22 credits in each semester. The modular structure of the curriculum allows for multiple entry and exit options. After successfully completion of 1 to 6 semesters, learners will be awarded a three-year Bachelor of Science (B.Sc.) degree with 132 credits. These credits will be distributed among Major Courses (DSC & DEC)), Minor courses, Open Electives (OEs), Ability Enhancement Courses (AEC), Skill Enhancement Courses (SEC), Value Education Courses (VEC), Indian Knowledge System (IKS), On Job Training (OJT), Field projects (FP), Co-curricular Courses (CC), Research Methodology (RM) etc

Among all offered courses, learners have to opt the courses as per NEP2020 guidelines.

Semester pattern: This programme is of total 8 semesters.
Distribution of the credits are as follows :

Sem	Mandatory Courses (DSC)				Elective Courses (DSE) (4 CR)	Minor Courses (2CR)		Open Elective OE (2CR)	VSC, SEC (VSEC) (2 CR)		AEC, VEC, IKS 2 CR	OJT, FP, CEP, CC (2/4 CR)	Total Courses (CR)
	Theory (T)		Practical (P)										
	4 CR	2 CR	4 CR	2 CR		T	P	T	T	T W/ P	T		
I	1	-	-	1	-	-	-	2	-	2	3	CC (2CR)	10 (22 CR)
II	1	-	-	1	-	1	-	2	-	2	2	CC (2CR)	10 (22 CR)
Cum Cr.	12				00	02		08	08		10	04	44
Exit option: Award of UG Certificate in Faculty of Science-Botany (Level 4.5) with 44 credits and an additional 4 credits core NSQF course/ Internship OR Continue with Major and Minor													
III	1	1	-	1	-	1	1	1	-	1	1	FP (2 CR) CC (2CR)	10 (22 CR)
IV	1	1	-	1	-	1	1	1	1	-	1	CEP (2 CR) CC (2CR)	10 (22 CR)
Cum Cr.	28				00	10		12	12		14	12	88
Exit option: Award of UG Diploma in Faculty of Science- Botany (Level 5.0) with 88 credits and an additional 4 credits core NSQF course/ Internship OR Continue with Major and Minor													
V	1	1	1	-	1	1	1	-	-	1	-	FP/ CEP (2 CR)	8 (22 CR)
VI	1	1	1	-	1	1	1	-	-	-	-	OJT (4CR)	7 (22 CR)
Cum Cr.	48				08	18		12	14		14	18	132
Exit option: Award of UG Degree in Botany (Level 5.5) with 132 credits OR Continue with Major and Minor													
VII	2	1	1	-	1	1 (4 CR)		-	-		-	-	6 (22 CR)
VIII	2	1	1	-	1	-		-	-		-	OJT (4CR)	6 (22 CR)
Cum Cr.	76				16	22		12	14		14	22	176
Four Year UG Honours Degree in Botany and Minor in xxx with 176 credits													

(course wise)):

Student Support Service System ***(Specify the provisions to be made at Head Quarter, Regional Centers, Learner Support Centers and Web based, etc):***

Programme Structure:

SN	Course	Code	Name	CA	EE	TM	Type	CR	Min%
[Level 4.5] Semester I: 22 Credits									
01	DSC	BOTC101	Evolution & Diversity of Algae, Fungi & Bryophytes	30	70	100	T	4	40%
02	DSC	BOTC102	Lab Activities on BOTC101	25	25	50	P	2	40%
03	OE	XXXE101	Select from other faculty OE courses List***	15	35	50	T	2	40%
04	OE	XXXE102	Select from other faculty OE courses List***	15	35	50	T	2	40%
05	VSC	BOTV101	Precision Agriculture	25	25	50	TW	2	40%
06	SEC	SECS101	Basic Instrumentation Skills	25	25	50	TW	2	40%
07	AEC	AECL101	Listening and Speaking Skills in English	15	35	50	T	2	40%
08	VEC	VECD101	Introduction to The Constitution of India	30	70	100	T	2	40%
Select Any One from IKSK101 to IKSK105									
09	IKS	IKSK101	भारतीय ज्ञान परंपरा – कला आणि प्राचीन भारतीय भाषा	15	35	50	T	2	40%
		IKSK102	भारतीय ज्ञान परंपरा – सामाजिक शास्त्रे	15	35	50	T	2	40%
		IKSK103	भारतीय ज्ञान परंपरा – आरोग्य शास्त्र	15	35	50	T	2	40%
		IKSK104	भारतीय ज्ञान परंपरा – विज्ञान आणि तंत्रज्ञान	15	35	50	T	2	40%
		IKSK105	Indian Knowledge System – Generic (Offered in Online Mode)	15	35	50	T	2	40%
Select Any One from CCRX101 to CCRX106									
10	CC	CCRX101	Health and Wellness-I	50	-	50	TW	2	40%

	CCRX102	Yoga Education-I	50	-	50	TW	2	40%
	CCRX103	Sports and Fitness-I	50	-	50	TW	2	40%
	CCRX104	Cultural Activities-I	50	-	50	TW	2	40%
	CCRX105	NSS-I	50	-	50	TW	2	40%
	CCRX106	Fine/Applied/Visual/Performing Arts-I	50	-	50	TW	2	40%
[Level 4.5] Semester II: 22 Credits								
11	DSC	BOTC103	Evolution & Diversity of Pteridophytes & Gymnosperms	30	70	100	T	4	40%
12	DSC	BOTC104	Lab Activities on BOTC103	25	25	50	P	2	40%
13	Minor	XXXM101	To be Selected from Minor Courses **List other than Major (DSC) ****	15	35	50	T	2	40%
14	OE	XXXE103	Select from other faculty OE courses List	15	35	50	T	2	40%
15	OE	XXXE104	Select from other faculty OE courses List	15	35	50	T	2	40%
16	VSC	BOTV102	Food Processing	25	25	50	TW	2	40%
17	SEC	SECS102	MS-Excel with AI	25	25	50	TW	2	40%
18	AEC	AECL101	Reading and Writing Skills in English	15	35	50	T	2	40%
19	VEC	VECD102	Environmental Education	15	35	50	T	2	40%
Select Any One from CCRX107 to CCRX112									
20	CC	CCRX107	Health and Wellness-II	50	-	50	TW	2	40%
		CCRX108	Yoga Education-II	50	-	50	TW	2	40%
		CCRX109	Sports and Fitness-II	50	-	50	TW	2	40%
		CCRX110	Cultural Activities-II	50	-	50	TW	2	40%
		CCRX111	NSS-II	50	-	50	TW	2	40%
		CCRX112	Fine/Applied/Visual/Performing Arts-II	50	-	50	TW	2	40%

Exit option: Award of UG Certificate in Faculty of Science- Botany (Level 4.5) with 44 credits and an additional 4 credits core NSQF course/ Internship OR Continue with Major and Minor										
[Level 5.0] Semester III: 22 Credits										
21	DSC	BOTC201	Angiosperm Morphology, Taxonomy & Diversity	30	70	100	T	4	40%
22	DSC	BOTC202	Indian Ancient Botany	15	35	50	T	2	40%
23	DSC	BOTC203	Lab Activities on BOTC201	25	25	50	P	2	40%
24	Minor	XXXM201	To be Selected from Minor Courses List **other than Major (DSC)****	15	35	50	T	2	40%
25		XXXM202	To be Selected from Minor Courses List **other than Major (DSC)****	25	25	50	P	2	40%
26	OE	XXXE201	Select from other faculty OE courses List***	15	35	50	T	2	40%
27	VSC	BOTV201	GI tagging in Indian Agriculture	25	25	50	P	2	40%
28	AEC	AECL201	श्रवण आणि संभाषण कौशल्ये	15	35	50	T	2	40%
29	FP	BOTF204	Field Project	50	-	50	TW	2	40%
Select Any One from CCRX201 to CCRX206									
30	CC	CCRX201	Health and Wellness-III	50	-	50	TW	2	40%
		CCRX202	Yoga Education-III	50	-	50	TW	2	40%
		CCRX203	Sports and Fitness-III	50	-	50	TW	2	40%
		CCRX204	Cultural Activities-III	50	-	50	TW	2	40%
		CCRX205	NSS-III	50	-	50	TW	2	40%
		CCRX206	Fine/Applied/Visual/Performing Arts-III	50	-	50	TW	2	40%
[Level 5.0] Semester IV: 22 Credits									
31	DSC	BOTC205	Plant Physiology & Metabolism	30	70	100	T	4	40%
32	DSC	BOTC206	Forestry	15	35	50	T	2	40%

33	DSC	BOTC207	Lab Activities on BOTC205	25	25	50	P	2	40%
34	Minor	XXXM203	To be Selected from Minor Courses List **other than Major (DSC)****	15	35	50	T	2	40%
35		XXXM204	To be Selected from Minor Courses List **other than Major (DSC)****	25	25	50	P	2	40%
36	OE	BOTE202	Select from other faculty OE courses List***	15	35	50	T	2	40%
37	SEC	SECS201	Intellectual Property Rights	25	25	50	T	2	40%
38	AEC	AECL202	वाचन आणि संभाषण कौशल्ये	15	35	50	T	2	40%
39	CEP	BOTG208	Awareness of Sustainable Development Goals-I	50	-	50	TW	2	40%
Select Any One from CCRX207 to CCRX212									
40	CC	CCRX207	Health and Wellness-IV	50	-	50	TW	2	40%
		CCRX208	Yoga Education-IV	50		50	TW	2	40%
		CCRX209	Sports and Fitness-IV	50	-	50	TW	2	40%
		CCRX210	Cultural Activities-IV	50		50	TW	2	40%
		CCRX211	NSS-IV	50	-	50	TW	2	40%
		CCRX212	Fine/Applied/Visual/Performing Arts-IV	50	-	50	TW	2	40%
Exit option: Award of UG Diploma in Faculty of Science- Botany (Level 5.0) with 88 credits and an additional 4 credits core NSQF course/ Internship OR Continue with Major and Minor									
[Level 5.5] Semester V: 22 Credits									
41	DSC	BOTC301	Cell Biology & Genetics	30	70	100	T	4	40%
42	DSC	BOTC302	Industrial Botany	15	35	50	T	2	40%
43	DSC	BOTC303	Lab Activities on BOTC301	50	50	100	P	4	40%
Select Any One from BOTC304, BOTC305, BOTC306									

44	DSE	BOTC304	Industrial & Environmental Microbiology	30	70	100	T	4	40%
	DSE	BOTC305	Bioinformatics	30	70	100	T	4	40%
	DSE	BOTC306	Fermentation Technology	30	70	100	T	4	40%
45	Minor	XXXM301	To be Selected from Minor Courses List **other than Major (DSC)****	15	35	50	T	2	40%
46	Minor	XXXM302	To be Selected from Minor Courses List **other than Major (DSC)****	25	25	50	P	2	40%
47	VSC	BOTV301	Basics of Plant Tissue Culture	25	25	50	P	2	40%
Select BOTF307 or CEPG308									
48	FP	BOTF307	Field Project	50	-	50	TW	2	40%
	CEP	BOTG308	Awareness of Sustainable Development Goals	50	-	50	TW	2	40%
[Level 5.5] Semester VI: 22 Credits									
49	DSC	BOTC309	Analytical Techniques in Plant Science & Horticulture	30	70	100	T	4	40%
50	DSC	BOTC310	Stress Biology	15	35	50	T	2	40%
51	DSC	BOTC311	Lab Activities on BOTC309	50	50	100	P	4	40%
Select Any One from BOTC312, BOTC313, BOTC314									
52	DSE	BOTC312	Economic Botany	30	70	100	T	4	40%
	DSE	BOTC313	Organic Farming	30	70	100	T	4	40%
	DSE	BOTC314	Agro Tourism	30	70	100	T	4	40%
53	Minor	XXXM303	To be Selected from Minor Courses List **other than Major (DSC)****	15	35	50	T	2	40%

54	Minor	XXXM304	To be Selected from Minor Courses List **other than Major (DSC)****	25	25	50	P	2	40%
55	OJT	BOTO315	On Job Training	50	50	100	TW	4	40%
Exit option: Award of UG Degree in Botany (Level 5.5) with 132 credits OR Continue with Major and Minor									
[Level 6.0] Semester VII: 22 Credits									
56	DSC	BOTC401	Diversity of Non-Vascular Plants-I	30	70	100	T	4	40%
57	DSC	BOTC402	Diversity of Non-Vascular Plants-II	30	70	100	T	4	40%
58	DSC	BOTC403	Diversity of Vascular Plants & Paleobotany -I	15	35	50	T	2	40%
59	DSC	BOTC404	Lab Activities on BOTC401, BOTC402 & BOTC403	50	50	100	P	4	40%
60	RM	RESR405	Research Methodology	30	70	100	T	4	40%
Select Any One from BOTC406, BOTC407									
61	DSE	BOTC406	Applied Phycology	30	70	100	T	4	40%
	DSE	BOTC407	Tools and Techniques in Plant Science	30	70	100	T	4	40%
[Level 6.0] Semester VIII: 22 Credits									
62	DSC	BOTC409	Plant Physiology	30	70	100	T	4	40%
63	DSC	BOTC410	Herbal Wealth	30	70	100	T	4	40%
64	DSC	BOTC411	Diversity of Vascular Plants and Paleobotany-II	15	35	50	T	2	40%
65	DSC	BOTC412	Lab Activities on BOTC409, BOTC410 & BOTC411	50	50	100	P	4	40%
66	OJT	BOTO413	On Job Training	50	50	100	TW	4	40%
Select Any One from BOTC415, BOTC416									
67	DSE	BOTC415	Biotechnology & Molecular Biology	30	70	100	T	4	40%

	DSE	BOTC416	Ecology & Phytogeography	30	70	100	T	4	40%

Four Year UG Honours Degree in Botany and Minor in xxx with 176 credits

Minor courses offered by Botany discipline for other discipline of same faculty or different faculty

a. These minor courses may be selected by learners who have not selected Botany as Major:

SN	Course	Code	Name	CA	EE	TM	Type	CR	Min %
Semester II									
01	Minor	BOTM101	Plant Diversity	15	35	50	T	2	40%
Semester III									
02	Minor	BOTM201	Morphology and Anatomy of Flowering Plants	15	35	50	T	2	40%
03	Minor	BOTM202	Lab Activities on BOTM201	25	25	50	T	2	40%
Semester IV									
04	Minor	BOTM203	Plant Physiology	15	35	50	T	2	40%
05	Minor	BOTM204	Lab Activities on BOTM203	25	25	50	T	2	40%
Semester V									
06	Minor	BOTM301	Introduction to Cytology	15	35	50	T	2	40%
07	Minor	BOTM302	Lab Activities on BOTM301	25	25	50	T	2	40%
Semester VI									
08	Minor	BOTM303	Plant Genetics & Variation	15	35	50	T	2	40%
09	Minor	BOTM304	Lab Activities on BOTM303	25	25	50	T	2	40%

b. Botany learners may select minor courses from the following discipline:

SN	Major in:	Minor in **(Anyone of the following other than Major):** Refer Appendix I
1.	**Botany**	Zoology, Chemistry, Environmental Science, Physics, Mathematics

Open Elective (OE) Courses of Botany offered for Other Faculty:

SN	Course	Code	Name	CA	EE	TM	Type	CR	Min %
Semester I									
01	OE	BOTE101	Bio fertilizers	15	35	50	T	2	40%
02	OE	BOTE102	Mushroom Culture Technology	15	35	50	T	2	40%
Semester II									
03	OE	BOTE103	Nursery and Gardening	15	35	50	T	2	40%
04	OE	BOTE104	Floriculture	15	35	50	T	2	40%
Semester III									
05	OE	BOTE201	Herbal Drug Technology	15	35	50	T	2	40%
Semester IV									
06	OE	BOTE202	Sustainable Agriculture	15	35	50	T	2	40%

Total Credits: **132** and **Total Courses**: **55** {3Y UG degree}
Total Credits: **176** and **Total Courses**:**67** {4Y UG degree}

Detailed Syllabi: Available at
https://drive.google.com/drive/folders/13lNyj1PT7qN-AAAi2eE8fwDAsCQFWMQz?tid=0B451Yjwt_acQR1VPSUQ4Qotvams

- Programme Outcomes and Courses Outcomes: Refer **Appendix – II**

Minimum programme duration:
- 3 yrs {for 3Y UG degree} and 4 yrs {4Y UG (Honours) degree}

Maximum Programme Duration:
- 6 yrs {for 3Y UG degree} and 8 yrs {4Y UG (Honours) degree}

Medium of Instruction: English

Type of Program: General

Faculty and Support Staff:

Director, School of Sciences: Prof. Chetana Kamlaskar
Academic Coordinator: Ms. Minakshi B. Kadel

Instructional Design & Delivery Mechanism:

In order to ensure and maintain the quality in science education, face-to-face counseling for theory and activities type of courses will be conducted at the designated LSCs during Saturdays and Sundays.

- **Minimum number of face-to-face counseling sessions:**

  12 (for 4 Credits)

  - (For each theory type of course of 4 credits duration of each counseling session shall be 01 Clock Hour)

  - (For each Practical/Project type of course of 4 credits duration of each counseling session shall be 02 Clock Hour).

- **Minimum number of face-to-face counseling sessions:**

		6 (for 2 Credits) - (For each theory type of course of 2 credits duration of each counseling session shall be 01 Clock Hour) - (For each Practical/Termwork type of course of 2 credits duration of each counseling session shall be 02 Clock Hour). • **Number of On Job Training (OJT) hours:** 120 hr (for 4 Credits) - One month 'On Job Training (OJT)' or Internship (Total Study hours 120 hrs including Internship Report) • **Required study efforts**: 1. For 3Y UG degree: Total 3960 Hours including Self-Study during all 06 semesters. 660 Hours (including Self-Study) during each semester. 2. For 4Y UG (Honours) degree: Total **5280** Hours including Self-Study during all 08 semesters. 660 Hours (including Self-Study) during each semester. • **Attendance**: Minimum 80% attendance recommended for all activity type of courses • **eBook**: eBook in SLM format for each course (Free Download from University website) at all semesters I to semester VIII **Student Support Service System**: At headquarter: Support from School, SSD, Evaluation Division and Exam Unit-3 At Regional Centers: From all 8 regional centers within MH At Learner Support Centers: Recognized Learner support centers within MH Web Based: http://www.ycmou.ac.in http://ycmou.digitaluniversity.ac
f	Procedure for admissions, curriculum transaction and evaluation **1.** Define the Admission Policy ***(including web-based tools to be adopted*:** 2. Eligibility Criteria: 3. Fee Structure: 4. Financial	All information related to the programme like admission policy, eligibility and fee structure, course curriculum, medium of instruction, evaluation policy - online home assignments and end examination pattern, SLMs etc. are transacted through prospectus, university website and official notification. **Admissions procedure**: A customized "Online Annual Admission system" available at DU portal http://ycmou.digitaluniveristy.ac Online payment facility is made available using a credit card or debit card or internet banking. **Admission Eligibility**: Entry level Eligibility Criteria

SN	Academic Qualifications required for Eligibility
A)	A candidate who has passed Standard 12th / (10+2)th / Level 4.0 examination conducted by Maharashtra State Board of Secondary and Higher Secondary Education/CBSE/ ISC/NIOS or equivalent examinations by any Other State or any other recognized Board with science subjects shall be eligible for admission to First Semester B. Sc. Programmes as per NEP 2020:

assistance to Learners (if any):

5. Activity planner of all academic activities of the academic session:
6. Exit Option- UG Certificate UG Diploma, UG Degree:

Policy for Evaluation of learner progress along with methods and tools:

	Groups of Science subjects/courses from		Eligible for **Any One Major** in Science Discipline
1.	1. English 2. Physics, Chemistry, Mathematics, Biology		**Any One Major from**: Physics, Chemistry, Mathematics, **Botany**, Zoology, Environmental Science
2.	1. English 2. Physics, Chemistry, Mathematics		**Any One Major from:** Physics, Chemistry, Mathematics, Environmental Science
3.	1. English 2. Physics, Chemistry, Biology		**Any One Major from**: Physics, Chemistry, **Botany,** Zoology, Environmental Science
4.	1. English 2. Vocational Course of 200 Marks 3. Physics, Chemistry, Mathematics		**Any One Major from:** Physics, Chemistry, Mathematics, Environmental Science
5.	1. English 2. Vocational Course of 200 Marks 3. Physics, Chemistry, Biology		**Any One Major from**: Physics, Chemistry, **Botany,** Zoology, Environmental Science
6.	1. English 2. Physics, Chemistry	3. Any one of the following Optional Course of 100 Marks: Geography, Geology, Food Science and Technology, Agriculture Science and Technology, Animal Science and Technology, Defence Studies	**Any One Major from**: Physics, Chemistry, Environmental Science
		3. Any one of the following Optional Course of 100 Marks: Food Science and Technology, Agriculture Science	**Major**: **Botany**
		3. Optional Course of 100 Marks: Animal Science and Technology	**Major**: Zoology
	OR		
B)	A candidate who has passed (10+3) years or (12+2) years Diploma from Maharashtra State Technical Board / a statutory or recognized board/ university in India		
	Description		**Eligible for Any One Major in Science Discipline**
1.	(10+3) years / (12+2) years Engineering Diploma		**Any One Major from:** Physics, Chemistry, Mathematics, Environmental Science
	OR		
C)	A candidate who has passed Higher Secondary School Certificate (10+2) Examination with English and any of the following +2 Level HSC Vocational (MCVC) Group		

	HSC Vocational (MCVC) Group		Eligible for **Any One Major** in Science Discipline
1.	Agriculture Group or Fisheries Group	Horticulture (KA, KB, KC)	**Any One Major from:** **Botany,** Environmental Science
		Crop Science (LA, LB, LC)	
		Animal Husbandry and Dairy Technology (MA, MB, MC)	**Any One Major from:** Zoology, Environmental Science
		Fisheries Technology (NA, NB, NC)	
2.	Catering and Food Products Technology	Catering and Food Products Technology (SA, SB, SC)	**Any One Major from:** **Botany,** Zoology, Environmental Science
3.	Paramedical Group	Child, Old Age and Health care services (QA, QB, QC)	**Any One Major from:** **Botany,** Zoology, Environmental Science
		Medical Laboratory Technician (OA, OB, OC)	**Any One Major from:** Physics, Chemistry, Zoology
		Ophthalmic Technician (RA, RB, RC)	**Major:** Physics
		Radiology Technician (PA, PB, PC)	
4.	Technology Group	Electronics Technology (EA, EB, EC)	**Major:** Physics
		Electrical Technology (FA, FB, FC)	

Total programme Fee: Approximately Total ₹ 28,724/- for all 06 Semesters and Total ₹ 52,292/- for all 08 Semesters, which is duly approved by the university authorities [*Will be updated as per University Policy decision*]

Curriculum Transaction:

- 01 SLM e-Book will be developed for each theory course
- Total 12/06 Face-To-Face counseling sessions, each of 60 Minutes duration, will be provided at respective learner support center, for each theory course.
- Total 12/18 Face-To-Face counseling sessions, each of 120 Minutes duration, will be provided at respective learner support center, for each practical/Field project/ OJT/ CC courses. In the laboratory, instruction would be given for the experiments followed by demonstration and finally the learners have to do the experiments individually.
- Curriculum updation will be after every 3 years

Activity planner: This University and School will follow the Programme Calender declared by UGC/DEB, New Delhi time to time. Teaching-Learning of students shall start from 01-September/01-Feb every year. Online continuous assessment proposed for all offered programmes.

SN	Activity Description	Yearly Pattern/ Odd semesters like 01, 03, 05 and 07 From 01-Sep Till 31-Jan	Even semesters like 02, 04, 06 and 08 From 01-Feb Till 31-Jul
Online Admission: offered on Annual basis for 2 semesters in each academic year. Only for 'C149: Certificate progarmme in Beekeeping', Admissions shall be offered on Winter and Summer batch basis.			
01	Fresh and Further Yearly Admission	From 1st June 2025 Till Sept 2025 (For C149, Winter Batch: From Jul)	NA (For C149, Summer Batch: From Jan)
Teaching – Learning at the resp Learning Support Centers/ SCs for all Theory, Practical, Term-Work, Studio, Project, FP & OJT Courses			
02	Teaching – Learning (16 Weeks) & Backlog Clearing	**From 1st Sept 2025 Till 14th Dec 2025**	**From 18th Jan 2026 Till 19th April 2026**
Online End Exam (EE) Form Submission (Required only for Repeater Students)			
03	**Online** EE Form Submission by SCs/ students at University	On or Before 21-Oct	On or Before 23-Apr
Continuous Assessment (CA) Submission			
04	CA Availability	August 2025	March 2025
05	CA Submission by Students	Upto last week of Dec 2025	Upto first week of Apr 2026
End Examination (EE) (Required only for Non-Repeater Students)			
07	**Online** EE Form Submission by SCs/ students at University	Upto third week of Oct 2025	Upto first week of Apr 2026
07	**End Exam for Theory Courses**	From first week of Jan 2026	From first week of May 2026
08	EE for Activity Courses (Pr, TW, PW, STW, SV)	Immediately after/ before the schedule of the end exam for theory courses, but positively before 1st Dec 2025 to 31st Dec 2025	Immediately after/ before the schedule of the end exam for theory courses, but positively before 10th Apr 2026 to 10th May 2026
09	OJT/Field Project (Completion Report/Presentation/Viva)	After Winter exam - Within One Month	After Summer exam - Within One Month

10	End Exam Result Declaration	Within 45 days from the last day of End Exam	Within 45 days from the last day of End Exam
Semester End Vacation			
10	Semester End Vacation	Jan	July

Policy:
Refer Evaluation pattern given in Appendix III.

For exit option:

1. **Multiple Entry Multiple Exit Option**:
   Compliance with MS G.R. No. NEP-2022/CR No. 09/VISHI-3/शिकाना, dated 20th April, 2023.

SN	Level of the Programme	Entry Option (with criteria)	Exit Option (with criteria)
1	Certificate Level	12th / (10+2)th / Level 4.0 examination conducted by Maharashtra State Board of Secondary and Higher Secondary Education/CBSE/ ISC/NIOS or equivalent examinations by any Other State or any other recognized Board with Science Subjects Pass, including English and Biology/ (Physics, Chemistry & Optional Course) or Equivalent pass **OR** Higher Secondary School Certificate (10+2) Examination with English and any of the following + 2 Level HSC Vocational (MCVC) Group Pass	Award of UG Certificate in the Faculty of Science - Botany (Level 4.5) with 44 credits and an additional 4 credits core NSQF course/ Internship.
2	Diploma Level	UG Certificate in the Faculty of Science – Botany (Level 4.5) with 40-44 credits	Award of UG Diploma in the Faculty of Science – Botany (Level 5.0) with 88 credits and an additional 4 credits core NSQF course/ Internship

		3 | Degree Level | UG Diploma in the Faculty of Science – Botany (Level 5.0) with 88 credits | Award of UG Degree in Botany with 132 credits
g	Requirement of the Laboratory Support and Library Resources: 1. Laboratory Support to the learners (*if any*): 2. Provision of Practical book for learners (*if any*): Provision of Virtual Reality Methods for Practical in case of Online learning (*if any*):	Laboratory requirement and Library Resources – Yes. Being mandatory requirement of the programme, Institutes/Colleges affiliated with conventional university offering B.Sc. (Botany) will be only recognized as a Learner support center of this university for this programme. So, requirement of laboratory support and library resources will be automatically ensured. Additionally, school provides practical workbook in the form SLM book and other learning resources to all enrolled learners. University has already initiated in-house Science Laboratory development task at HQ, these labs will be made available to the enrolled learners in future. **Recommended**: Recognized LSCs with • Computer infrastructure with Wi-Fi/broadband connection with Botany related software/tool and Library facilities.
h	Cost Estimate of the Program and the Provisions: Indicate the Budgetary Requirement for: 1. Programme Development 2. Program Delivery Program Maintenance	Budget provision for this development under A.27.P.38: Fees/Royalties/ Honorarium to Writer/Editors/Trans. SLM development cost: Approximately ₹ 60,00,000/-
i	Quality Assurance Mechanism and expected Program Outcomes*: 1. Define the Review Mechanism of the Program for enhancing the standards of curriculum, instructional design relevant to	B.Sc. (Honours) programme is designed to provide scientific as well as professional level competency to learners, and offers advanced theoretical as well as practical knowledge to learners. This programme enables the learner to develop interest in knowing more about the Botany and to develop research attitude. University has policy to review and revise every course at least once in five years of its launching. **Quality Assurance Mechanism**: The following key result areas will be closely monitored. • Well qualified and experienced experts nomination on Programme Advisory Committee (PAC) for design and development of relevant course content • Well qualified subject experts for SLM development and Evaluation task • Enrollment of student (Equated Access) • Equal weightage for each credit in learner evaluation

	professional requirements: 2. Define Program Benchmark Statements: 3. Mechanism for Monitoring the effectiveness of the program: ***(Minimum standards must adhere to "UGC Open and Distance Learning Programmes and Online Programmes Regulations, 2020" & directions of the Statutory Bodies of the University)**	• Demonstrate in-depth knowledge of Botany, both in theory and practical • Examination Results • Placements/satisfaction of passing out students • Administrative/stakeholder feedback • Centre for Internal Quality Assurance (CIQA) to ensure quality of offered science programmes. **Expected Program Outcomes:** After successful completion of this programme, students will be able to • Demonstrate interdisciplinary competence by applying principles from Botany to solve real-life applications. • Exhibit a profound understanding of core concepts and theories in Botany. • Excel in critical thinking and problem-solving, addressing complex issues that span both disciplines. • Possess proficiency in laboratory techniques, enabling the design and execution of experiments in Botany. • Engage in interdisciplinary research projects and contribute to scientific advancements. • Communicate scientific findings effectively, both in written reports and oral presentations. • Adhere to ethical standards and academic integrity in research and experimentation in botany related fields. • Adapt to diverse career opportunities, showing flexibility in their choice of career paths. • Collaborate effectively in multidisciplinary teams, displaying leadership and teamwork skills. • Stay informed about contemporary scientific issues, including their societal implications.

B. **Duration & Nomenclature**

Name of Programme :-	4 Year Bachelor of Science (Honours) (Botany)
Medium	English
Year	2026-27
Level	UG, level 4.5
Academic Session	July Onwards
Entry Qualification (as per the Specification of Degrees, 2014)	12th / (10+2)th / Level 4.0 examination conducted by Maharashtra State Board of Secondary and Higher Secondary Education/CBSE/ ISC/NIOS or equivalent examinations by any Other State or any other recognized Board with Science

	Subjects Pass, including English and Biology/ (Physics, Chemistry & Optional Course) or Equivalent pass **OR** Higher Secondary School Certificate (10+2) Examination with English and any of the following + 2 Level HSC Vocational (MCVC) Group Pass Horticulture (KA, KB, KC) Crop Science (LA, LB, LC) Catering and Food Products Technology (SA, SB, SC) Child, Old Age and Health care services (QA, QB, QC) For details Refer **Appendix IV**
Duration (as per the Specification of Degrees, 2014)	4 Year Bachelor of Science (Honours) (Botany)
Name of the Department	School of Sciences

C. **Mode of Evaluation**

Year	2026-27	
Whether Weightages to continuous assessment and end semester examinations or term end examinations as per clause mentioned in Regulations	Yes 1. 30% - 70% weightage Pattern for theory 2. 50% - 50% Weightage pattern for Practical/VSC/SEC*/OJT 3. 100% Weightage to Continuous Assessment for FP/CC/CEP 4. *only one SEC course is Theory type	
Examination Scheme	Formative and Summative	
Percentage of Continuous Assessment (%)	Theory	30%
	Practical/OJT/VSC/SEC	50%
	FP/ CC/CEP	100%
	Passing	40%
Percentage of Term End Examination (%)	Theory	70%
	Practical/OJT/VSC/SEC	50%
	Passing	40%
Pass or Fail Criteria	40% for Pass	
Pass/Fail Criteria (% Pass Marks)	40% and above - Pass Below 40 % - Fail	

D. Mode of Examination

Whether examination through Online (For ODL Programs)	No

E. SLM Development (Submit all SLM in PDF in pen drive and prepare the SLM availability sheet in the order as per sample in PDF for each program separately)

Particulars	% SLM in house developed	% SLM in collaboration with HEI (It should not be more than 40% of total SLM. If it is in collaboration then provide MOU in Soft & Hard copy
Printing Material	100%	–
Audio-Video Material	-	–
Online Material	Yes [PDF of SLMs]	–
Computer based Material	–	–

F. Program wise faculty details (Requirement of Minimum three faculty not below the rank of Assistant Professor to be furnished in the following format – to be taken from Establishment

Sr. No.	Emp. No	Name of the Faculty	Designation	Date of Joining	Qualification	Specialization	Teaching experience	Address	Phone no.	Email	Appointment letter
1	Y0939	Ms. Minakshi B. Kadel	Academic Coordinator (Assistant Professor Level)	13/03/2024	M.Sc. (Botany), SET (Life Sciences), SET (Environmental Sciences), M.A. (Economics)	BOTANY	3.5 Years	YCMOU	8888694739	sos.botany@ycmou.ac.in	04/03/2024
2											
3											

G. List of Learner Support Centres Program wise and Region wise to be submitted as per following format. (We have intimated the same to Director SSD. **You are requested to give him the list of programs for which the LSCs data is required.**) – to be taken from SSD Director

Sr. No	Study centre code	Name & Address of LSC	Name of the HEI to which college/Institute is affiliated (where LSC is established)	Whether the College /Institute Private or Govt. (where LSC is established)	Name and Contact Details of Coordinator/ counsellor :	Qualification of Coordinator/ Counsellor :	No. of Counsellor :	Name of Proposed Programmes/ Course from July, 2023 onwards:	Approved	Not Approved with Reason

Minor courses offered from school of sciences for other discipline of same faculty or different faculty other than Botany as a Major

LEVEL	SEM	Credits	Course Type	Physics	Chemistry	Mathematics	Zoology	Environmental Science
4.5	II	2	T	**PHYM101:** Basics of Electricity & Magnetism	**CHEM101:** Basic of Physical Chemistry	**MATM101:** Foundation of Mathematics	**ZOOM101:** Animal Diversity of Invertebrates	**EVSM101:** Fundamentals of Environment
5.0	III	2	T	**PHYM201:** Thermal Physics	**CHEM201:** Introduction to Organic Chemistry	**MATM201:** Fundamentals of Calculus	**ZOOM201:** Principle of Ecology	**EVSM201:** Wildlife Biology
		2	P	**PHYM202:** Lab Activities on PHYM201	**CHEM202:** Lab Activities on CHEM201	**MATM202:** Practical Based on MATM201	**ZOOM202:** Lab Activities on ZOOM201	**EVSM202:** Lab Activities on EVSM201
	IV	2	T	**PHYM203:** Oscillations & Optics	**CHEM203:** Introduction to Inorganic Chemistry	**MATM203:** Applied Linear Algebra	**ZOOM203:** Fundamentals of Cell Biology	**EVSM203:** Water & Noise Quality
		2	P	**PHYM204:** Lab Activities on PHYM203	**CHEM204:** Lab Activities on CHEM203	**MATM204:** Practical Based on MATM203	**ZOOM204:** Lab Activities on ZOOM203	**EVSM204:** Lab Activities on EVSM203
5.5	V	2	T	**PHYM301:** Computational Physics	**CHEM301:** Advanced Physical Chemistry	**MATM301:** Introductory Differential Equations	**ZOOM301:** Introduction to Aquatic Biology	**EVSM301:** Air & Soil Quality
		2	P	**PHYM302:** Lab Activities on PHYM301	**CHEM302:** Lab Activities on CHEM301	**MATM302:** Practical Based on MATM301	**ZOOM302:** Lab Activities on ZOOM301	**EVSM302:** Lab Activities on EVSM 301
	VI	2	T	**PHYM303:** Basics of Instrumentation	**CHEM303:** Introduction to Organic and Inorganic Chemistry	**MATM303:** Numerical Methods	**ZOOM303:** General Parasitology	**EVSM303:** Environmental Governance
		2	P	**PHYM304**: Lab Activities on PHYM303	**CHEM304:** Lab Activities on CHEM303	**MATM304:** Practical Based on MATM303	**ZOOM304:** Lab Activities on ZOOM303	**EVSM304:** Lab Activities on EVSM 303

Appendix – II

Programme Objectives, Scope of the Programme & Programme Outcomes (PO) And Course Outcomes (CO)

Programme Name: 4 Year Bachelor of Science (Honours) (Botany)		
1	**Programme Objectives**	This programme has the following broad objectives: • Interdisciplinary Competence: To provide students with a strong foundation in both Botany fostering interdisciplinary knowledge and skills. • Deep Understanding: To ensure that students gain a deep understanding of the fundamental principles and concepts in Botany. • Problem-Solving Abilities: To equip students with problem-solving skills, enabling them to apply scientific methodologies to address complex issues that require expertise in both disciplines. • Laboratory Proficiency: To develop practical laboratory skills, enabling students to design experiments, collect data, and analyse results in both Botany. • Research Aptitude: To nurture research aptitude by encouraging students to engage in interdisciplinary research projects at the undergraduate level. • Effective Communication: To enhance communication skills, allowing students to communicate scientific findings effectively, both in writing and orally. • Ethical Responsibility: To instil ethical values and academic integrity, promoting responsible conduct in scientific research and experimentation. • Flexibility and Adaptability: To prepare students for diverse career opportunities, including academia, research, industry, and entrepreneurship, by offering a versatile skill set.
2	**Scope of the Programme**	After successful completion of this programme, learners may get opportunities in various fields/sectors to work as • Multidisciplinary Foundation: The Programme offers students a strong foundation in both Physics and Chemistry, allowing them to explore the intersection of these disciplines. • Interdisciplinary Research: Students are encouraged to engage in interdisciplinary research projects, where they can apply their knowledge of botany to address complex scientific challenges.

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Specialization Opportunities: While Botany is the major field of study provides students with the opportunity to specialize in certain areas, such as bioinformatics, taxonomy, molecular biology, plant tissue culture, organic farming, etc. depending on their interests.
Flexible Career Paths: Graduates of this Programme are well-prepared for diverse career opportunities, including academia, research, industry, and entrepreneurship. They can pursue careers in areas such as nursery and gardening, floriculture, mushroom culture technology, herbal drug technology, herbal medicine etc.

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<tr><td>3</td><td>Programme Outcomes</td><td>After successful completion of this programme, learners will be able to

Demonstrate interdisciplinary competence by applying principles from Botany to solve real-life Applications.
Exhibit a profound understanding of core concepts and theories in Botany.
Excel in critical thinking and problem-solving, addressing complex issues that span both disciplines.
Possess proficiency in laboratory techniques, enabling the design and execution of experiments in Botany.
Engage in interdisciplinary research projects and contribute to scientific advancements.
Communicate scientific findings effectively, both in written reports and oral presentations.
Adhere to ethical standards and academic integrity in research and experimentation in various fields in Botany.
Adapt to diverse career opportunities, showing flexibility in their choice of career paths.
Collaborate effectively in multidisciplinary teams, displaying leadership and teamwork skills.
Stay informed about contemporary scientific issues, including their societal implications.

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<tr><td>4</td><td>Course Outcomes</td><td>
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<tr><th>SN</th><th>Course Code & Name</th><th>Course Outcomes
(After successful completion of this course, student should be able to –)</th></tr>
<tr><td colspan="3">Semester I</td></tr>
<tr><td>1.</td><td>BOTC101: Evolution and Diversity of</td><td>• Recognize the wide variety of algae, including their classification, structure, reproduction and ecological roles.</td></tr>
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				Algae, Fungi and Bryophytes (T)	• Know the evolutionary significance of algae their role in the development of early life and their contribution to primary production. • Explain the ecological importance of algae in aquatic ecosystems including their role in the food web and oxygen production.
			2.	**BOTC102:** Lab Activities on BOTC101 (P)	• Analyse and interpret experimental data related to the growth, reproduction and diversity of algae, fungi and bryophytes. • Apply field identification techniques and record ecological data accurately.
			3.	**BOTE101**: Biofertilizers (For other faculty)	• Define biofertilizers and their role in sustainable agriculture. • Identify different types of biofertilizers (e.g., nitrogen-fixing, phosphate-solubilizing, potassium-mobilizing). • Explain the role of microorganisms (e.g., Rhizobium, Azotobacter, Azospirillum, Mycorrhizae) in soil fertility. • Evaluate the advantages of biofertilizers over chemical fertilizers.
			4.	**BOTE102**: Mushroom Culture Technology (For other faculty)	• Identify different types of edible and medicinal mushrooms. • List the essential environmental conditions required for mushroom cultivation. • Describe various mushroom cultivation methods (e.g., bed culture, bag culture, bottle culture). • Differentiate between various types of substrates and their suitability for specific mushroom species. • Harvest mushrooms at the appropriate stage for maximum yield and quality. • Examine market trends to determine the profitability of mushroom farming.
			5.	**BOTV101**: Precision Agriculture	• Define the concept and scope of precision agriculture and its importance in modern farming. • Describe the tools, technologies, and components used in precision

					agriculture (e.g., GPS, GIS, sensors, drones). • Explain the role of data collection, analysis, and decision-making in site-specific crop management. • Identify variability in soil, crop, and environmental conditions using precision tools. • Interpret geospatial data for nutrient management, irrigation scheduling, and pest control.
			6.	**SECS101**: Basic Instrumentation Skills	• Demonstrate competence in using various instruments and equipment. • Safely conduct experiments and collect reliable data. • Analyze and interpret experimental results effectively. • Apply instrumentation skills in their respective fields of study and research. • Foster a culture of safety, ethics, and environmental responsibility in scientific work. • Identify, describe, and explain the function of various scientific instruments used in their respective field. • Demonstrate correct operation, calibration, and maintenance procedures for laboratory instruments, ensuring accuracy and reliability in their measurements. • Adhere to laboratory safety guidelines, use personal protective equipment (PPE) appropriately, and follow best practices to minimize risks and ensure a safe working environment.
			7.	**AECL101:** Listening and Speaking Skills in English	• Identify, comprehend, and interpret main ideas and supporting details in spoken English across different contexts using active and critical listening strategies. • Demonstrate correct pronunciation, stress, and intonation in spoken English, showing increased fluency and confidence in both academic and social interactions. • Initiate and sustain basic conversations using polite expressions, greetings, and small talk appropriate to different situations. • Engage effectively in extended conversations in formal and informal contexts, using cohesive devices and

					demonstrating good interactional competence and turn-taking skills. • Participate constructively in group discussions, express opinions logically and respectfully, and respond persuasively to others' viewpoints. • Perform effectively in interviews, applying suitable verbal and non-verbal communication techniques with confidence and professional self-presentation. • Communicate accurately and courteously over the telephone, demonstrating clarity, appropriate etiquette, and the ability to handle both formal and informal telephonic interaction.
			8.	**VECD101:** Introduction to the Constitution of India	• Understand the philosophy, structure, and values of the Constitution of India. • Gain awareness about Fundamental Rights, Fundamental Duties, and Directive Principles of State Policy. • Understand the role and functioning of constitutional institutions such as Parliament, Executive, and the Judiciary. • Understand Citizenship, Democracy, and the Rule of Law. • Develop the capacity to critically analyze constitutional provisions and contemporary political issues.
			9.	**IKSK101:** भारतीय ज्ञान परंपरा – कला आणि प्राचीन भारतीय भाषा	• To be Updated
				IKSK102: भारतीय ज्ञान परंपरा – सामाजिक शास्त्रे	• To be Updated
				IKSK103: भारतीय ज्ञान परंपरा – आरोग्य शास्त्र	• To be Updated
				IKSK104: भारतीय ज्ञान परंपरा – विज्ञान आणि तंत्रज्ञान	• To be Updated
				IKSK105:	• To be Updated

			Indian Knowledge System – Generic	
		10.	**CCRX101:** Health and Wellness-I	• To be Updated
			CCRX102: Yoga Education-I	• To be Updated
			CCRX103: Sports and Fitness-I	• To be Updated
			CCRX104: Cultural Activities-I	• To be Updated
			CCRX105: NSS-I	• To be Updated
			CCRX106: Fine/Applied/Visual/Performing Arts-I	• To be Updated
		Semester II		
		1.	**BOTC103:** Evolution and Diversity of Pteridophytes and Gymnosperms	• Identify and describe the key morphological features of Pteridophytes and gymnosperms. • Classify various Pteridophytes and gymnosperms into their respective taxonomic groups based on observed characteristics.
		2.	**BOTC104:** Lab Activities on BOTC103	• Identify and describe the key morphological and anatomical features of pteridophytes and gymnosperms. • Classify various pteridophytes and gymnosperms into their respective taxonomic groups based on observed characteristics
		3.	**BOTM101:** Plant Diversity (For other discipline)	• List different plant groups based on classification systems. • Describe the structural and functional diversity among different plant groups. • Illustrate the life cycle of a selected plant group.
		4.	**BOTE103:** Nursery and Gardening	• Define basic nursery and gardening terms such as propagation, pruning, grafting, and soil conditioning.

				(For other faculty)	• Identify common tools and equipment used in nurseries and gardening. • Summarize the role of nurseries in sustainable agriculture and landscaping. • Implement pest and disease management strategies in a nursery.
			5.	**BOTE104:** Floriculture (For other faculty)	• Analyse market trends and demands in the floriculture industry. • List major commercial flower crops and their uses in landscaping and floral arrangements. • Identify different floriculture techniques such as open-field cultivation, greenhouse farming, and hydroponics.
			6.	**BOTV102:** Food Processing	• List different food processing techniques such as drying, freezing, canning, and fermentation. • Identify key food additives, preservatives, and their functions in food products. • Summarize food safety regulations, including HACCP and FSSAI guidelines. • Analyse factors affecting food spoilage and contamination.
			7.	**SECS102:** MS–Excel with AI	• Effectively use basic Excel functions and features to perform data analysis and manipulation tasks. • Create various types of charts and visualizations in Excel and interpret them to extract meaningful insights • Use Excel's statistical tools to perform and interpret basic statistical analyses. • Leverage AI-powered features in Excel to gain insights and enhance their data analysis capabilities. • Use Power Query to import, clean, and transform data from various sources efficiently. • Create and use macros to automate repetitive tasks, improving efficiency in Excel.
			8.	**AECL102:** Reading and Writing Skills in English	• Demonstrate an expanded vocabulary and apply appropriate word choices in reading and writing contexts, and comprehend, interpret, and analyse

					different types of texts with accuracy and critical understanding. • Employ suitable reading strategies to achieve specific objectives such as skimming, scanning, and intensive reading, and read efficiently with improved speed and retention, adjusting pace according to text difficulty, and interpret data and information effectively from tables, charts, diagrams, and graphs. • Construct grammatically correct and meaningful sentences using appropriate structures and transformations, and write coherent and well-organized paragraphs and essays with logical development of ideas. • Compose formal and informal letters using appropriate tone, format, and style, and prepare structured and concise reports for academic and professional purposes, and write effective and context-appropriate emails and social media messages using clarity and digital etiquette. Integrate reading and writing skills to express ideas logically, persuasively, and accurately across contexts.
			9.	**VECD102:** Environmental Education	• Analyze historical, cultural, and industrial impacts on the environment, and explain the evolution of sustainability. • Distinguish between environmental issues at different spatial and temporal scales and evaluate pollution types and impacts. • Interpret pollution data and health standards, and assess pollution-related health risks. • Apply principles of environmental management and sustainability tools in real-world situations for decision-making and policy assessment.
			10.	**CCRX107:** Health and Wellness-II	• To be updated
				CCRX108: Yoga Education-II	• To be updated

			CCRX109: Sports and Fitness-II	• To be updated
			CCRX110: Cultural Activities-II	• To be updated
			CCRX111: NSS-II	• To be updated
			CCRX112: Fine/Applied/Visual/Performing Arts-II	• To be updated
		Semester III		
		1.	**BOTC201:** Angiosperm Morphology, Taxonomy and Diversity	• Identify the key structures of angiosperms. • Analyse morphological adaptations and explain how they enable plants to thrive in diverse environments.
		2.	**BOTC202:** Indian Ancient Botany	• Demonstrate a comprehensive understanding of the major ancient Indian botanical texts and their historical significance. • Discuss the philosophical and spiritual perspectives on plant life as presented in ancient Indian thought. • Classify plants according to ancient Indian taxonomic systems and describe the key features of different plant groups. • Acquire knowledge of medicinal plants mentioned in ancient Indian texts, their properties, and traditional uses in Ayurveda and other healing traditions. • Understanding of the relationship between indigenous communities and plant resources, including the cultural, religious, and sustainable aspects of plant use. • Learn about ancient Indian agricultural practices, including crop cultivation, soil management, and sustainable farming techniques.
		3.	**BOTC203:** Lab Activities on BOTC201	• Identify a wide range of angiosperms species using morphological characteristics and taxonomic keys. • Collect, preserve and document plant specimens during field trips. • Recognize various fruit types and seed

					dispersal mechanisms and their ecological implications.
		4.	**BOTM201:** Morphology & Anatomy of Flowering Plants (For other Discipline)		• Define basic terms related to plant morphology and anatomy. • Describe the external features of root, stem, leaf, inflorescence, flower, fruit, and seed. • Classify flowering plants based on morphological characteristics of vegetative and reproductive organs. • Identify different types of tissues and tissue systems in flowering plants. • Explain the internal structure of dicot and monocot roots, stems, and leaves. • Compare anatomical features of primary and secondary growth in plant organs. • Illustrate labelled diagrams of plant structures observed under the microscope. • Analyse variations in floral structures and their relevance to taxonomy. • Differentiate between normal and anomalous secondary growth in dicots.
		5	**BOTM202:** Lab Activities on BOTM201		• Identify a wide range of angiosperms species using morphological characteristics and taxonomic keys. • Collect, preserve and document plant specimens during field trips. • Recognize various fruit types and seed dispersal mechanisms and their ecological implications.
		6.	**BOTE201:** Herbal Drug Technology (For other faculty)		• Define key terms related to herbal drugs, phytochemistry, and traditional medicine systems. • Describe the sources, classification, and identification of herbal drugs. • Explain the methods of extraction, purification, and standardization of herbal products. • Identify common medicinal plants and analyse their therapeutic uses and active constituents. • Compare traditional herbal formulations with modern phytopharmaceuticals.

		7.	**BOTV201:** GI Tagging in Indian Agriculture	• Define the concept of Geographical Indication (GI) and its relevance in agriculture. • Identify major Indian agricultural products that have received GI tags. • Explain the legal framework governing GI tagging in India, including the Geographical Indications of Goods (Registration and Protection) Act, 1999. • Describe the procedure for obtaining a GI tag for an agricultural product. • Analyse the economic, cultural, and environmental benefits of GI tagging for farmers and communities. • Evaluate the role of GI tags in promoting rural development, traditional knowledge, and sustainable agriculture.
		8.	**AECL201:** श्रवण आणि संभाषण कौशल्ये	• To be updated
		9.	**BOTF204:** Field Project	• Students will demonstrate the ability to apply theoretical knowledge and concepts to real world situations, effectively bridging the gap between academia and practical applications. • Students will develop advanced research and investigative skills, including the ability to design and execute research projects, collect and analyse data, and draw well-founded conclusions. • Students will conduct independent research, demonstrating the ability to formulate research questions, design appropriate methodologies, and independently execute fieldwork or data collection. • Students will exhibit effective collaboration and communication skills, demonstrating the ability to work collaboratively with others, engage in professional dialogue, and effectively communicate their research findings to diverse audiences. • Develop advanced problem-solving and critical thinking abilities,

				demonstrating the capacity to identify and address challenges encountered during fieldwork, analyse complex data, and propose innovative solutions. • Demonstrate a thorough understanding of ethical considerations, field safety protocols, and best practices in their chosen field of study.
		10.	**CCRX201:** Health and Wellness-III	• To be updated
			CCRX202: Yoga Education-III	• To be updated
			CCRX203: Sports and Fitness-III	• To be updated
			CCRX204: Cultural Activities-III	• To be updated
			CCRX205: NSS-III	• To be updated
			CCRX206: Fine/Applied/Visual/Performing Arts-III	• To be updated
		Semester IV		
		1.	**BOTC205:** Plant Physiology and Metabolism	• Explain the processes of water transport, nutrient uptake, and gas exchange in plants. • Analyse the factors affecting the efficiency of photosynthesis and respiration in plants. • Describe the role of essential nutrients in plant metabolism.
		2.	**BOTC206:** Forestry	• Analyse forest ecosystems including their structure, function and dynamics. • Apply silviculture techniques for the cultivation and management of trees and forests. Implement sustainable forest management practices including inventory and growth modelling.

					• To manage wildlife and habitats understanding their relationships with forest ecosystems.
			3.	**BOTC207:** Lab Activities on BOTC205	• Utilize laboratory equipment and techniques specific to plant physiology experiments proficiently. • Prepare and stain plant tissues to observe cellular structures. • Investigate the role of stomata in gas exchange and water regulation.
			4.	**BOTM203:** Plant Physiology (For other Discipline)	• Define fundamental concepts related to plant physiological processes. • Describe the mechanisms of water absorption, transport, and transpiration in plants. • Explain the processes of photosynthesis and respiration and their significance in plant metabolism. • Illustrate the pathways of nutrient uptake and transport in plants. • Identify plant hormones and describe their roles in growth and development. • Analyse the effects of environmental factors on physiological processes like germination, flowering, and senescence. • Compare C3, C4, and CAM photosynthetic pathways.
			5.	**BOTM204:** Lab Activities on BOTM203	• Utilize laboratory equipment and techniques specific to plant physiology experiments proficiently. • Prepare and stain plant tissues to observe cellular structures. • Investigate the role of stomata in gas exchange and water regulation.
			6.	**BOTE202:** Sustainable Agriculture (For other faculty)	• Identify traditional and modern sustainable agricultural practices. • Explain the role of biodiversity, soil health, and water conservation in sustainable farming. • Compare conventional and sustainable agricultural systems. • Analyze the impact of agricultural practices on the environment and local communities. • Evaluate the effectiveness of different sustainable farming methods (e.g., organic farming, permaculture, agroforestry).

		7..	**SECS201:** Intellectual Property Rights	• Compare and contrast different forms of IPR and their roles in protecting innovation. • Apply the knowledge of copyright and patent laws to real-world creative and inventive works. • Interpret the provisions of Indian IPR legislation and evaluate landmark case laws. • Demonstrate the ability to draft and file basic patent applications and understand prosecution procedures. • Identify and explain specialized areas of IPR, including geographical indications, plant varieties, and biodiversity protection.
		8.	**AECL202:** वाचन आणि लेखन कौशल्ये	• To be Updated
		9	**BOTG208 (CEPG201):** Awareness of Sustainable Development Goals -I	• To be Updated
		10	**CCRX207:** Health and Wellness-IV	• To be Updated
			CCRX208: Yoga Education-IV	• To be Updated
			CCRX209: Sports and Fitness-IV	• To be Updated
			CCRX210: Cultural Activities-IV	• To be Updated
			CCRX211: NSS-IV	• To be Updated
			CCRX212: Fine/Applied/Visual/Performing Arts-IV	• To be Updated
		Semester V		

		1.	**BOTC301:** Cell Biology & Genetics	• Explain key cellular processes such as cell division, energy production, and cell signalling. • Describe mechanisms of membrane transport and how they regulate the movement of molecules into and out of cells. • Explain the molecular mechanisms of DNA replication, transcription, and translation. • Apply critical thinking to evaluate scientific evidence, analyse genetic concepts, and synthesize information to answer complex questions.
		2.	**BOTC302:** Industrial Botany	• Explain development of high- yield crops: - industrial botany aims to breed and cultivate plants with desirable traits such as high biomass production, disease resistance and efficient resource utilization. • Increase biofuel production.
		3.	**BOTC303:** Lab Activities on BOTC301	• Explain key cellular processes such as cell division, energy production, and cell signalling. • Describe mechanisms of membrane transport and how they regulate the movement of molecules into and out of cells. • Explain the molecular mechanisms of DNA replication, transcription, and translation. • Apply critical thinking to evaluate scientific evidence, analyse genetic concepts, and synthesize information to answer complex questions.
		4.	**BOTC304:** Industrial and Environmental Microbiology	• Achieve enhanced yields and productivity in fermentation processes for diverse applications. • Develop microorganism based solutions for efficient and cost effective remediation of environmental pollutants. • Investigate microbial processes involved in nutrient cycling. • Develop microbial based strategies for the degradation and detoxification of

					pollutants in air, water and soil.
		5.	**BOTC305:** Bioinformatics	• Develop computational methods and tools for the analysis of genomic sequences. • Create algorithms and software for analysing protein sequences. • Develop bioinformatics approaches for analysing individual genomic data.
		6.	**BOTC306:** Fermentation Technology	• Gain the knowledge of design of fermenters, types of fermenters, equipment, instruments used, and sterilization processers. • Prepare the fermentation media, inoculum preparation, Scale up Processes and with the various downstream processes of fermentation industries.
		7.	**BOTM301:** Introduction to Cytology (For other Discipline)	• Define key concepts related to cell structure and function. • Identify various cell organelles and describe their roles. • Compare prokaryotic and eukaryotic cells based on structural and functional characteristics. • Illustrate the structure of cellular components using diagrams. • Explain the processes of cell division (mitosis and meiosis) and their biological significance.
		8.	**BOTM302:** Lab Activities on BOTM301	• Explain key cellular processes such as cell division, energy production, and cell signalling. • Describe mechanisms of membrane transport and how they regulate the movement of molecules into and out of cells.
		9.	**BOTV301:** Basics of Plant Tissue Culture	• Design a tissue culture protocol for a specific plant species.
		10.	**BOTF307:** Field Project	• Apply theoretical knowledge and concepts to real world situations, effectively bridging the gap between academia and practical applications. • Develop advanced research and investigative skills, including the ability to design and execute research

				projects, collect and analyse data, and draw well-founded conclusions. • Conduct independent research, demonstrating the ability to formulate research questions, design appropriate methodologies, and independently execute fieldwork or data collection. • Exhibit effective collaboration and communication skills, demonstrating the ability to work collaboratively with others, engage in professional dialogue, and effectively communicate their research findings to diverse audiences. • Develop the problem-solving and critical thinking abilities, demonstrating the capacity to identify and address challenges encountered during fieldwork, analyse complex data, and propose innovative solutions. • Demonstrate a thorough understanding of ethical considerations, field safety protocols, and best practices in their chosen field of study.
			11.	**BOTG308:** Awareness of Sustainable Development Goals -II	• To be updated
			Semester VI		
			1.	**BOTC309:** Analytical Techniques in Plant Sciences & Horticulture	• Operate spectroscopic instruments and interpret spectroscopic data for plant characterization. • Analyse and interpret data obtained from analytical techniques and present results effectively. • Apply critical thinking skills to select appropriate analytical methods and troubleshoot technical issues. • Develop research skills necessary for conducting experiments, collecting data, and drawing conclusions in the

					context of plant sciences and horticulture
			2.	**BOTC310:** Stress Biology	• Describe physiological and biochemical responses of plants to various stress conditions. • Compare the effects of different abiotic stress conditions on plant growth and development. • Develop strategies to enhance crop resilience against climate change-related stressors.
			3.	**BOTC311:** Lab Activities on BOTC309	• Operate spectroscopic instruments and interpret spectroscopic data for plant characterization. • Analyse and interpret data obtained from analytical techniques and present results effectively. • Apply critical thinking skills to select appropriate analytical methods and troubleshoot technical issues. • Develop research skills necessary for conducting experiments, collecting data, and drawing conclusions in the context of plant sciences and horticulture.
			4.	**BOTC312:** Economic Botany	• To help identify plants with economic importance such as food crops, medicinal plants, fibres, timbers. • To understand the botany of crops leads to improved agricultural practices
			5.	**BOTC313:** Organic Farming	• Enhance soil fertility structure. • Improved water quality and conservation. • Support rural economics and communities. • Promote ecological balance and harmony.
			6.	**BOTC314:** Agro tourism	• Acquire agricultural knowledge by observing and participating in farming activities. • Develop environmental awareness through exposure to sustainable farming practices. • Explore rural lifestyles and cultural heritage tied to agricultural traditions.

				• Apply sustainability practices in farming and daily life to reduce environmental impact.
		7.	**BOTM303:** Plant Genetics & Variation (For other Discipline)	• Explain the significance of genetic variation in plant evolution and breeding. • Identify the roles of DNA, RNA, and proteins in plant genetics. • Compare different types of genetic variations such as mutations, polyploidy, and chromosomal aberrations.
		8.	**BOTM304:** Lab Activities on BOTM303	• Describe the steps involved in DNA extraction and PCR amplification. • Compare genetic variation in different plant populations using molecular tools.
		9.	**BOTO315:** On Job Training	• Demonstrate proficiency in applying theoretical knowledge and academic concepts to real-world professional situations. • Possess job-specific skills that are relevant to their chosen field of study, enabling them to perform tasks and responsibilities effectively and efficiently. • Acquire a comprehensive understanding of industry practices, trends, and challenges, contributing to their overall knowledge and expertise in the field. • Establish professional networks and relationships, expanding their professional connections and opportunities for future collaborations and career advancement. • Develop problem-solving and critical thinking abilities, demonstrating the ability to analyze complex situations, make informed decisions, and propose effective solutions. • Demonstrate professionalism, adaptability, and effective communication skills in a professional work environment.
		Semester VII		
		1.	**BOTC401:** Diversity of Non	• Identify and describe the different types of nonvascular plants.

				–Vascular Plants -I	• Explain the key features of nonvascular plants and their life cycles. • Discuss the ecological importance of nonvascular plants. • Apply their knowledge of nonvascular plants to real-world problems, such as conservation and restoration.
			2.	**BOTC402:** Diversity of Non-Vascular Plants - II	• Identify and describe the different types of nonvascular plants. • Explain the key features of nonvascular plants and their life cycles. • Discuss the ecological importance of nonvascular plants. • Apply their knowledge of nonvascular plants to real-world problems, such as conservation and restoration. • Evaluate the potential of nonvascular plants as biofertilizers and bioagents.
			5.	**BOTC403:** Diversity of Vascular Plants and Paleobotany-I	• Identify the major groups of vascular plants, both living and extinct. • Explain the evolutionary relationships between the major groups of vascular plants. • Concise paleobotanical data to reconstruct the history of the Earth's climate and environment.
			4.	**BOTC404:** Lab Activities on BOTC401, BOTC402 & BOTC403	• Identify the major groups of non-vascular plants, both living and extinct, with 80% accuracy. • Explain the evolutionary relationships between the major groups of non-vascular plants. • Use non-vascular plant data to reconstruct the history of the Earth's climate and environment.
			5.	**BOTC406:** Applied Phycology	After successful completion of this course, student should be able to • Identify and classify different groups of algae, including their morphological and anatomical characteristics. • Analyse the physiological processes of algae, including photosynthesis and reproduction, and relate them to broader botanical principles. • Evaluate the impact of algae on the environment, including harmful algal

				blooms and their management strategies. • Apply phycological knowledge in the field of agriculture, including algae-based fertilizers, biofertilizers, and soil health improvement.
		6.	**BOTC407:** Tools and Techniques in Plant Science	• Understand the basic tools and techniques used in plant science, such as microscopes, cell culture techniques, and genetic engineering. • Apply these tools and techniques to the study of plants, such as the identification of plant cells, the culture of plant cells, and the transformation of plant cells with genes. • Communicate effectively about tools and techniques in plant science through written reports, presentations, and other media.
		7.	**RESR405:** Research Methodology	• Design a research study to investigate the effects of climate change on the distribution of a particular species of plant. • Collect data on the abundance of different species of plants in a particular ecosystem. • Analyse data to determine the factors that limit the growth of a particular species of plant. • Write a research paper that summarizes the results of their research study and discusses the implications of their findings. • Give a presentation to a lay audience about their research study and its findings.
		Semester VIII		
		1.	**BOTC409:** Plant Physiology	• Describe the fundamental physiological processes in plants, such as photosynthesis, respiration, transpiration, and nutrient uptake. • Explain the role of plant hormones in growth regulation, development, and responses to environmental cues. • Understand the mechanisms of water and mineral transport in plants and their significance in maintaining plant health and homeostasis.

					• Analyze the factors influencing plant growth, including light, temperature, humidity, and nutrient availability. • Investigate the responses of plants to abiotic and biotic stress factors, such as drought, salinity, pathogens, and herbivores. • Evaluate the impact of environmental factors on crop productivity and explore strategies for improving crop yield and stress tolerance.
			2.	**BOTC410:** Herbal Wealth	• Identify and classify a wide range of medicinal and economically important plants and herbs based on their botanical characteristics. • Describe the traditional and contemporary uses of herbs in different cultures for medicinal, culinary, cosmetic, and aromatic purposes. • Understand the chemical constituents and active compounds present in medicinal herbs and their potential therapeutic benefits. • Evaluate the scientific evidence supporting the medicinal properties and efficacy of herbal remedies. • Discuss the importance of herbal wealth in the context of traditional medicine systems, such as Ayurveda, Traditional Chinese Medicine, and Indigenous knowledge. • Analyse the ecological significance of herbal resources and their conservation in the context of sustainable practices and biodiversity conservation.
			3.	**BOTC411:** Diversity of Vascular Plants and Paleobotany-II	• Identify the major groups of vascular plants, both living and extinct. • Explain the evolutionary relationships between the major groups of vascular plants. • Concise the paleobotanical data to reconstruct the history of the Earth's climate and environment. • Write a research paper on a topic related to the diversity of vascular plants.

		4.	**BOTC412:** Lab Activities on BOTC409, BOTC410 & BOTC411	• Identify medicinal plants by their common and scientific names. • Describe the chemical constituents of medicinal plants and their effects on humans. • Discuss the traditional and modern uses of medicinal plants. • Evaluate the safety and efficacy of medicinal plants. • Collect and prepare herbarium specimens. • Conduct field studies of medicinal plants. • Apply ethical principles to the study and use of medicinal plants.
		5.	**BOTC415:** Biotechnology and Molecular Biology	• Define the terms "biotechnology", "molecular biology", and explain their relationship to each other. • Understand the basic principles of biotechnology and molecular biology, such as DNA cloning, gene expression, and protein synthesis. • Apply these principles to the study of plants, such as the development of new cultivars, the improvement of crop yields, and the development of new drugs. • Communicate effectively about biotechnology and molecular biology through written reports, presentations, and other media.
		6.	**BOTC416:** Ecology and Phytogeography	• Understand the basic principles of ecology and phytogeography, such as the distribution of plants, the interactions between plants and their environment, and the effects of human activities on plant communities. • Apply these principles to the study of plant communities, such as the identification of plant communities, the study of the factors that influence the distribution of plants, and the assessment of the impact of human activities on plant communities. • Communicate effectively about ecology and phytogeography through written reports, presentations, and other media.

		7.	**BOTO413**: On Job Training (OJT)	• Demonstrate proficiency in the skills and knowledge required for the job. • Communicate effectively with colleagues and supervisors. • Work independently and as part of a team. • Solve problems and make decisions. • Demonstrate professional behaviour and ethics. • Reflect on their experiences and identify areas for further learning and development.

Appendix III

Evaluation Pattern

[CA and EE Evaluation Pattern as per the Minutes of the Meeting of the NEP Cell Dated 21.11.2023 and subsequent School Council Meetings]

SN	Type of Course	Continuous Assessment (CA)	End Examination (EE)
1	Theory (T) **4 Credit** 100 Marks CA: 30% EE: 70%	Each student is required to attempt total 02 (Two) "Continuous Assessments (CAs)" for each course of each Semester, as per the following details: 1. CA01: 'Continuous Assessment 01 (CA01)' on Credit 01 to Credit 04 of each course, consists of • 2 (Two) 'Short Answer Questions (SAQs)', each carrying 05 Marks, on Credit 01 and Credit 02 **and** • 1 (One) 'Long Answer Question (LAQ)' of 10 Marks, on Credit 03 and Credit 04. LAQ may consist of sub-questions. **CA01**: On Credit 01 to Credit 04, of Marks = (5x2 + 10) = **20 Marks** 2. CA02: 'Continuous Assessment 02 (CA02)' on Credit 01 to Credit 04 of each course, consists of • A test containing total **10** (Ten) 'Objective Type Questions, ' 05 (Five) on Credit 01 and Credit 02, and 05 (Five) on Credit 03 and Credit 04. Each 'Objective Type Question' of 1 Mark. **CA02**: On Credit 01 to Credit 04, of Marks = **10 Marks** 3. Maximum number of attempts for **CA**, during each semester :Single attempt only 4. **Total Marks**: **30** Marks	1. Student is required to answer **05 'VSAQs' out of 06 'VSAQs'**, each carrying 03 Marks, on Credit 01 to 04, for total 15 Marks. One VSAQ will be on each Credit. 2. Student is required to answer **05 'SAQs' out of 06 'SAQs'**, each carrying 05 Marks, on Credit 01 to 04, for total 25 Marks. One SAQ will be on each Credit. 3. Student is required to answer **01 'LAQ' out of 2 LAQs,** of 10 Marks on Credit 01 and Credit 02, for total 10 Marks. LAQ may consist of sub-questions. 4. Student is required to answer **01 'LAQ' out of 2 LAQs,** of 10 Marks on Credit 03 and Credit 04, for total 10 Marks. LAQ may consist of sub-questions. 5. Student is required to answer **01 'LAQ' out of 2 LAQs,** of 10 Marks on Credit 01 to Credit 04, for total 10 Marks. LAQ may consist of sub-questions. 6. Number of attempts: Till Valid Registration Period (VRP) only 7. Marks: 70 Marks 8. Duration: 150 minutes

<table>
<tr><th>SN</th><th>Type of Course</th><th colspan="2">Continuous Assessment (CA)</th><th>End Examination (EE)</th></tr>
<tr><td></td><td></td><td colspan="3"><table>
<tr><th>SN</th><th>Description</th><th>Evaluation of End Examination(EE)</th><th>Marks</th></tr>
<tr><td rowspan="3">1</td><td rowspan="3">Question Types</td><td>Very Short Answer Question (VSAQ) on each Credit</td><td>03 Marks</td></tr>
<tr><td>Short Answer Question (SAQ) on each Credit</td><td>05 Marks</td></tr>
<tr><td>On each Credit, either Single Long Answer Question (LAQ) or LAQ contains sub-questions (a), (b) and so on.</td><td>10 Marks</td></tr>
<tr><td>2</td><td>Grand Total Marks</td><td>Total five Questions in EE Question paper based on:
Credit 01 to 04 : 05 VSAQs out of 06 VSAQs (15 Marks)
Credit 01 to 04 : 05 SAQs out of 06 SAQs (25 Marks)
Credit 01 to 02 : 01 LAQ out of 02 LAQs (10 Marks)
Credit 03 to 04 : 01 LAQ out of 02 LAQs (10 Marks)
Credit 01 to 04 : 01 LAQ out of 02 LAQs (10 Marks)
LAQ may contains sub-questions</td><td>70 Marks</td></tr>
</table></td></tr>
<tr><td>2</td><td>Theory (T)

2 Credit
50 Marks

CA: 30%
EE: 70%</td><td colspan="2">Each student is required to attempt total 01 (One) “Continuous Assessment (CA)” for each course of each Semester, as per the following details:
1. CA01: 1 (One) ‘Continuous Assessment 01 (CA01)’ on Credit 01 and Credit 02 of each course, consists of
• 1 (One) ‘Short Answer Question (SAQ)’ of 5 Marks
and
• 1 (One) ‘Long Answer Question (LAQ)’of 10 Marks, LAQ may consist of sub-questions.
CA01: On Credit 01 and Credit 02, of Marks = (5 + 10) = 15 Marks
2. Maximum number of attempts for CA, during each semester: Single attempt only
3. Total Marks: 15 Marks</td><td>1. Student is required to answer 05 ‘VSAQs’ out of 06 ‘VSAQs’, each carrying 03 Marks, on Credit 01 to 02, for total 15 Marks. One VSAQ will be on each Credit.
2. Student is required to answer 02 ‘SAQs’ out of 03 ‘SAQs’, each carrying 05 Marks, on Credit 01 to 02, for total 10 Marks. One SAQ will be on each Credit.
3. Student is required to answer 01 ‘LAQ’ out of 2 LAQs, of 10 Marks on Credit 01 and Credit 02, for total 10 Marks. LAQ may consist of sub-questions.
4. Number of attempts: Till Valid Registration Period (VRP) only
5. Marks: 35 Marks
6. Duration: 75 minutes</td></tr>
</table>

<table>
<tr><th>SN</th><th>Type of Course</th><th colspan="3">Continuous Assessment (CA)</th><th colspan="3">End Examination (EE)</th></tr>
<tr><td></td><td></td><td></td><td colspan="5"><table>
<tr><td>SN</td><td>Description</td><td>Evaluation of End Examination (EE)</td><td>Marks</td></tr>
<tr><td rowspan="3">1</td><td rowspan="3">Question Types</td><td>Very Short Answer Question (VSAQ) on each Credit</td><td>03 Marks</td></tr>
<tr><td>Short Answer Question (SAQ) on each Credit</td><td>05 Marks</td></tr>
<tr><td>On each Credit, either Single Long Answer Question (LAQ) or LAQ contains sub-questions (a), (b) and so on.</td><td>10 Marks</td></tr>
<tr><td>2</td><td>Grand Total Marks</td><td>Total three Questions in EE Question paper based on:
Credit 01 to 02 : 05 VSAQs out of 06 VSAQs (15 Marks)
Credit 01 to 02 : 02 SAQs out of 03 SAQs (10 Marks)
Credit 01 to 02 : 01 LAQ out of 02 LAQs (10 Marks)
LAQ may contains sub-questions</td><td>35 Marks</td></tr>
</table></td></tr>
</table>

<table>
<tr><th>SN</th><th>Type of Course</th><th>Continuous Assessment (CA)</th><th>End Examination (EE)</th></tr>
<tr><td>3</td><td>Practical (P)

4 Credit
100 Marks

CA: 50%
EE: 50%</td><td>1. Student is required to submit “Activity Report in Work-Book Format” for each Credit in the prescribed format.
2. Maximum number of attempts for each CA, during each semester : Single attempt only
3. Marks: 50 Marks
4. Grading criteria:
<table>
<tr><td>Lab Punctuality, Preparedness & Ethics</td><td>Irregular in lab. Copies the experiment from others
(0 Points)</td><td>Consistently regular but unable to explain the concepts
(06 Points)</td><td>Punctuality in lab. Follows the procedure and responds to questions asked
(10 Points)</td></tr>
<tr><td>Activity Report and Performance

(Experiment No, Date, Objectives, Apparatus with specification, Observations, Graphs, software used if any)</td><td>Poor Documentation and copied the experiment from others.
Couldn't perform the Activity /poor observation made
(04 Points)</td><td>Average Documentation: Report is in format but some of the formatting guidelines are missed. Performed the Activity but observations made with some mistakes
(12 Points)</td><td>Good Documentation: Lab activity writing is in proper format with all references, Grammar.
Performed the Activity on time observations made with no mistakes
(20 Points)</td></tr>
<tr><td>Results and Conclusion</td><td>Unable to achieve the desired results but makes attempts to relate data to theory. Poor concluding statements
(08 Points)</td><td>Average graphical and tabulated representation with misinterpret physical significance of theory. Achieve the desired results and but insufficient conclusion statement.
(14 Points)</td><td>Analyses and interpret observed data carefully with good graphical and tabulated representation using appropriate theory/evidence. Achieve the results and reach to appropriate Conclusion
(20 Points)</td></tr>
</table></td><td>External and internal examiners shall assess each student based on:
1. Workbook/Activity Report submission by the student (Only by External Examiner) [05 Marks]
2. Practical Activity performed by the student [12 Marks]
3. Result and Conclusion of the Practical Activity [13 Marks]
4. Viva-Voce on Practical Activities [20 Marks]
5. Number of attempts: Till Valid Registration Period (VRP) only
6. Marks: 50 Marks
7. Duration: 180 minutes</td></tr>
</table>

SN	Type of Course	Continuous Assessment (CA)	End Examination (EE)

SN	Evaluation of Practical End Examination		
	Description	Internal Examiner	External Examiner
1	Workbook/Activity Report	-	05 Marks
2	Actual Conduct of one randomly selected Practical Activity	02 Marks	10 Marks
3	Diagram, Synoptic Answers, Graph/Observation and Conclusion	03 Marks	10 Marks
4	Viva-Voce/Oral	05 Marks	15 Marks
5	Total	10 Marks	40 Marks

<table>
<tr><th>SN</th><th>Type of Course</th><th>Continuous Assessment (CA)</th><th>End Examination (EE)</th></tr>
<tr><td>4</td><td>Practical (P)

2 Credit
50 Marks

CA: 50%
EE: 50%</td><td>1. Student is required to submit “Activity Report in Work-Book Format” for each Credit in the prescribed format.
2. Maximum number of attempts for each CA, during each semester: Single attempt only
3. Marks: 25 Marks
4. Grading criteria:
<table>
<tr><td>Lab Punctuality, Preparedness & Ethics</td><td>Irregular in lab. Copies the experiment from others
(0 Points)</td><td>Consistently regular but unable to explain the concepts
(03 Points)</td><td>Punctuality in lab. Follows the procedure and responds to questions asked
(05 Points)</td></tr>
<tr><td>Activity Report and Performance

(Experiment No, Date, Objectives, Apparatus with specification, Observations, Graphs, software used if any)</td><td>Poor Documentation and copied the experiment from others.
Couldn't perform the Activity /poor observation made
(02 Points)</td><td>Average Documentation: Report is in format but some of the formatting guidelines are missed. Performed the Activity but observations made with some mistakes
(06 Points)</td><td>Good Documentation: Lab activity writing is in proper format with all references, Grammar.
Performed the Activity on time observations made with no mistakes
(10 Points)</td></tr>
<tr><td>Results and Conclusion</td><td>Unable to achieve the desired results but makes attempts to relate data to theory. Poor concluding statements
(04 Points)</td><td>Average graphical and tabulated representation with misinterpret physical significance of theory. Achieve the desired results and but insufficient conclusion statement.
(07 Points)</td><td>Analyses and interpret observed data carefully with good graphical and tabulated representation using appropriate theory/evidence. Achieve the results and reach to appropriate Conclusion
(10 Points)</td></tr>
</table></td><td>1. External and internal examiners shall assess each student based on:
a. Workbook/Activity Report submission by the student (Only by External Examiner) [05 Marks]
b. Practical Activity performed by the student [06 Marks]
c. Result and Conclusion of the Practical Activity [07 Marks]
d. Viva-Voce on Practical Activities [07 Marks]
2. Number of attempts: Till Valid Registration Period (VRP) only
3. Marks: 25 Marks
4. Duration: 180 minutes</td></tr>
</table>

SN	Type of Course	Continuous Assessment (CA)	End Examination (EE)

SN	Evaluation of Practical End Examination		
	Description	Internal Examiner	External Examiner
1	Workbook/Activity Report	-	05 Marks
2	Actual Conduct of one randomly selected Practical Activity	01 Marks	05 Marks
3	Diagram, Synoptic Answers, Graph/Observation and Conclusion	02 Marks	05 Marks
4	Viva-Voce/Oral	02 Marks	05 Marks
	Total	05 Marks	20 Marks

<table>
<tr><th>SN</th><th>Type of Course</th><th colspan="2">Continuous Assessment (CA)</th><th>End Examination (EE)</th></tr>
<tr><td>5</td><td>Term Work (TW)

2 Credit
50 Marks

CA: 50%
EE: 50%

For SEC & VSC courses</td><td colspan="2">1. Student is required to submit “Activity Report in Work-Book Format” for each Credit in the prescribed format.
2. Maximum number of attempts for each CA, during each semester: Single attempt only
3. Marks: 25 Marks
4. Grading Criteria:
<table>
<tr><td>Lab Punctuality, Preparedness & Ethics</td><td>Irregular in lab. Copies the experiment from others (0 Points)</td><td>Consistently regular but unable to explain the concepts (03 Points)</td><td>Punctuality in lab. Follows the procedure and responds to questions asked (05 Points)</td></tr>
<tr><td>Activity Report and Performance

(Experiment No, Date, Objectives, Apparatus with specification, Observations, Graphs, software used if any)</td><td>Poor Documentation and copied the experiment from others. Couldn't perform the Activity /poor observation made (02 Points)</td><td>Average Documentation: Report is in format but some of the formatting guidelines are missed. Performed the Activity but observations made with some mistakes (06 Points)</td><td>Good Documentation: Lab activity writing is in proper format with all references, Grammar. Performed the Activity on time observations made with no mistakes (10 Points)</td></tr>
<tr><td>Results and Conclusion</td><td>Unable to achieve the desired results but makes attempts to relate data to theory. Poor concluding statements (04 Points)</td><td>Average graphical and tabulated representation with misinterpret physical significance of theory. Achieve the desired results and but insufficient conclusion statement. (07 Points)</td><td>Analyses and interpret observed data carefully with good graphical and tabulated representation using appropriate theory/evidence. Achieve the results and reach to appropriate Conclusion (10 Points)</td></tr>
</table></td><td>1. External and internal examiners shall assess each student based on:
a. Workbook/Activity Report submission by the student (Only by External Examiner) [05 Marks]
b. Viva-Voce on Practical Activities [20 Marks]
2. Number of attempts: Till Valid Registration Period (VRP) only
3. Marks: 25 Marks
4. Duration: 180 minutes</td></tr>
<tr><td colspan="5"><table>
<tr><td rowspan="2">SN</td><td colspan="3">Evaluation of Practical End Examination</td></tr>
<tr><td>Description</td><td>Internal Examiner</td><td>External Examiner</td></tr>
<tr><td>1</td><td>Workbook/Activity Report</td><td>-</td><td>05 Marks</td></tr>
<tr><td>2</td><td>Viva-Voce/Oral</td><td>05 Marks</td><td>15 Marks</td></tr>
<tr><td></td><td>Total</td><td>05 Marks</td><td>20 Marks</td></tr>
</table></td></tr>
</table>

<table>
<tr><th>SN</th><th>Type of Course</th><th>Continuous Assessment (CA)</th><th>End Examination (EE)</th></tr>
<tr><td>6</td><td>Field Project (TW)

2 Credit
50 Marks

CA: 100%</td><td>Students need to complete Field Project (Total Study hours 60 hrs including Activity Report) related to selected Major. After completion of the field project, learners shall submit a report to the LSC - Programme Coordinator (PC) and Mentor/Guide.
1. Maximum number of attempts for each CA, during each semester: Single attempt only
2. Duration: Minimum 15 days or 2 Weeks duration – Any month during the semester Any month during the semester 3 & semester 5 of UG programme
3. Marks: 50 Marks
4. Grading Criteria for Evaluation of FP (only by Internal Examiner - Programme Coordinator (PC)/ Supervisor of LSC):
<table>
<tr><th>SN</th><th>Description</th><th>Marks</th></tr>
<tr><td>1</td><td>Key Definitions of Problem area and analysis of preliminary data</td><td>10</td></tr>
<tr><td>2</td><td>Work related to formats, Correspondence, Interactions and liaising etc</td><td>05</td></tr>
<tr><td>3</td><td>Field work and data collection</td><td>10</td></tr>
<tr><td>4</td><td>Feedback to community</td><td>05</td></tr>
<tr><td>5</td><td>Report submission</td><td>10</td></tr>
<tr><td>6</td><td>Viva-Voce /Oral</td><td>10</td></tr>
<tr><td colspan="2">Total</td><td>50</td></tr>
</table></td><td>End Examination is Not Applicable (NA)</td></tr>
</table>

<table>
<tr><th>SN</th><th>Type of Course</th><th>Continuous Assessment (CA)</th><th>End Examination (EE)</th></tr>
<tr><td>7</td><td>OJT or Internship (TW)

4 Credit
100 Marks

CA: 50%
EE: 50%</td><td>
1. Students need to complete one month On Job Training (OJT) or Internship (Total Study hours 120 hrs including Internship Report) in any Industry/Organization/Institute/ R&D Division /Any Micro/ Small/ Medium/ enterprise/Govt/NGO/PSU/Online Internship related to major course.
2. Maximum number of attempts for each CA, during each semester: Single attempt only
3. Marks: 50 Marks
4. Duration: 1 Month or 4 Weeks –
Any one month within semester duration, but before end examination of that particular semester
5. Grading Criteria for Evaluation of OJT (or Intern) only by Mentor where the Internship is proposed to be imparted:
<table>
<tr><th>SN</th><th>Parameters</th><th>Marks Out of</th></tr>
<tr><td>1</td><td>Behaviours, shows interest in assigned work, Willingness to learn</td><td>10</td></tr>
<tr><td>2</td><td>Accepts responsibility, cooperates with co-workers and supervisors, Demonstrates organizational skills</td><td>10</td></tr>
<tr><td>3</td><td>Uses time, knowledge and expertise effectively, Analyses problems effectively</td><td>10</td></tr>
<tr><td>4</td><td>Demonstrates creativity/ originality / any innovative contribution, Professional ethics and accountability</td><td>10</td></tr>
<tr><td>5</td><td>Writes effectively, Produces high quality work/Skill Proficiency</td><td>10</td></tr>
<tr><td colspan="2">Total</td><td>50</td></tr>
</table>
Document as Evidence: Activity report along with Certificate or Declaration, duly issued and signed by the concerned authority [To be assessed during EE] should be submitted during End Examination to the parent Learner support Centre (LSC).
</td><td>
At the end of second semester, Programme Coordinator (PC)/ Supervisor of LSC and 1 (one) External Examiner will complete ‘End Exam (EE)’ for all allotted students as follows:
1. Duration of EE: After Theory EE of second Semester
2. Programme Coordinator (PC)/ Supervisor of LSC and External Expert will have 20% and 80% weightage respectively in EE.
3. Number of attempts: Till Valid Registration Period (VRP) only
4. Marks for EE: 50 Marks
<table>
<tr><th>Parameter</th><th>PC /Supervisor of LSC</th><th>External Expert</th></tr>
<tr><td>Professional Attitude</td><td>-</td><td>05 Marks</td></tr>
<tr><td>Maintenance of Daily Diary</td><td>-</td><td>10 Marks</td></tr>
<tr><td>Internship Report</td><td>05 Marks</td><td>10 Marks</td></tr>
<tr><td>Viva/Oral</td><td>05 Marks</td><td>15 Marks</td></tr>
<tr><td>Total</td><td>10 Marks</td><td>40 Marks</td></tr>
</table>
</td></tr>
</table>

SN	Type of Course	Continuous Assessment (CA)	End Examination (EE)
8	CEP (TW) **2 Credit** 50 Marks CA: 100%	**1.** CEP Proposals*: 15 Marks **2.** Planning community work, correspondence, formats, interactions, liaising: 10 Marks **3.** CEP report**: 15 marks **4.** Viva /Presentation: 10 Marks **5.** **Marks**: **50 Marks**	End Examination is Not Applicable (NA)
		*__CEP Proposals__: 1) Basic structure of Society 2) Key definitions of Problem area 3) Analysis of Preliminary data **__CEP Report__: 1) Field work and data gathering 2) Analysis and reporting	

Appendix – IV

Entry level qualification to B. Sc. (Honours) Programmes

SN	Academic Qualifications required for Eligibility		
A)	A candidate who has passed Standard 12th / (10+2)th / Level 4.0 examination conducted by Maharashtra State Board of Secondary and Higher Secondary Education/CBSE/ ISC/NIOS or equivalent examinations by any Other State or any other recognized Board with science subjects shall be eligible for admission to First Semester B. Sc. Programmes as per NEP 2020:		
	Groups of Science subjects/courses from		**Eligible for Any One Major in Science Discipline**
1.	1. English 2. Physics, Chemistry, Mathematics, Biology		**Any One Major from**: Physics, Chemistry, Mathematics, **Botany**, Zoology, Environmental Science
2.	1. English 2. Physics, Chemistry, Mathematics		**Any One Major from:** Physics, Chemistry, Mathematics, Environmental Science
3.	1. English 2. Physics, Chemistry, Biology		**Any One Major from**: Physics, Chemistry, **Botany,** Zoology, Environmental Science
4.	1. English 2. Vocational Course of 200 Marks 3. Physics, Chemistry, Mathematics		**Any One Major from:** Physics, Chemistry, Mathematics, Environmental Science
5.	1. English 2. Vocational Course of 200 Marks 3. Physics, Chemistry, Biology		**Any One Major from**: Physics, Chemistry, **Botany,** Zoology, Environmental Science
6.	1. English 2. Physics, Chemistry,	3. Any one of the following Optional Course of 100 Marks: Geography, Geology, Food Science and Technology, Agriculture Science and Technology, Animal Science and Technology, Defence Studies	**Any One Major from**: Physics, Chemistry, Environmental Science
		3. Any one of the following Optional Course of 100 Marks: Food Science and Technology, Agriculture Science	**Major**: **Botany**
		3. Optional Course of 100 Marks: Animal Science and Technology	**Major**: Zoology
OR			
B)	A candidate who has passed (10+3) years or (12+2) years Diploma from Maharashtra State Technical Board / a statutory or recognized board/ university in India		
	Description		**Eligible for Any One Major in Science Discipline**
1.	(10+3) years / (12+2) years Engineering Diploma		**Any One Major from:** Physics, Chemistry, Mathematics, Environmental Science
OR			
C)	A candidate who has passed Higher Secondary School Certificate (10+2) Examination with English and any of the following +2 Level HSC Vocational (MCVC) Group		
	HSC Vocational (MCVC) Group		**Eligible for Any One Major in Science Discipline**
1.		Horticulture (KA, KB, KC)	**Any One Major from:**

SN	Academic Qualifications required for Eligibility		
	Agriculture Group or Fisheries Group	Crop Science (LA, LB, LC)	**Botany,** Environmental Science
		Animal Husbandry and Dairy Technology (MA, MB, MC)	**Any One Major from:** Zoology, Environmental Science
		Fisheries Technology (NA, NB, NC)	
2.	Catering and Food Products Technology	Catering and Food Products Technology (SA, SB, SC)	**Any One Major from:** **Botany,** Zoology, Environmental Science
3.	Paramedical Group	Child, Old Age and Health care services (QA, QB, QC)	**Any One Major from:** **Botany,** Zoology, Environmental Science
		Medical Laboratory Technician (OA, OB, OC)	**Any One Major from:** Physics, Chemistry, Zoology
		Ophthalmic Technician (RA, RB, RC)	**Major:** Physics
		Radiology Technician (PA, PB, PC)	
4.	Technology Group	Electronics Technology (EA, EB, EC)	**Major:** Physics
		Electrical Technology (FA, FB, FC)	

END OF DOCUMENT

DEB-UGC application for Programme approval for AY 2025-26

School of Sciences, YCMOU Nashik

(Formerly School of Architecture, Science and Technology)

Programme Project Report (PPR)

UGV03: B.Sc. (Honours) (Mathematics) {2025 Pattern}

A. Programme project report (PPR)

Name of Programme: 4 Year Bachelor of Science (Honours) (Mathematics)		
a	Programme's mission & objectives	**Mission**: The "Bachelor of Science (Honours)" is an innovative programme based on a number of core, elective and skill courses in Mathematics. Upon graduation, the learners will be able to understand and appreciate the impact of "Mathematics" in day-to-day life. Further, the learners will be exposed to the current trends in research about "Mathematics". The mission is to forge a solid foundation in Mathematics, empowering learners to confidently tackle and analyze complex scientific challenges with ease. This program aims to cultivate strong analytical skills to prepare learners to excel in the field of Mathematics. The program provides a comprehensive education in both theoretical and experimental Mathematics. Learners will engage in hands-on practical activities and immersive field projects or internships, ensuring they acquire not only fundamental knowledge but also practical skills vital for success in the scientific community. **Objectives**: The main objectives for offering this programme, are • Access to Science Education: To provide science education opportunities through learner Open and Distance Learning (ODL), making learning accessible and cost effective. • Deep Understanding: To ensure that learners gain a deep understanding of the fundamental principles and concepts in Mathematics. • Problem-Solving Abilities: To equip students with problem-solving skills, enabling them to apply scientific methodologies to address complex issues that require expertise in Mathematics disciplines. • Research Aptitude: To nurture research aptitude by encouraging learners to engage in interdisciplinary research projects at the undergraduate level. • Effective Communication: To enhance communication skills, allowing learners to communicate scientific findings effectively, both in writing and orally. • Flexibility and Adaptability: To prepare learners for diverse career opportunities, including academia, research, industry, and entrepreneurship, by offering a versatile skill set. • Engage in life-long learning and will have recognition.
b	Relevance of the Programme with HEI's Mission and Goals	Objects of the YCMOU (as per the YCMOU Act) which would be fulfilled by implementing the proposed program (a) To provide through instruction, teaching and training and other educational opportunities, access to larger and larger segment of

		population, and in particular to the disadvantaged groups such as those living in remote and rural areas including working people, housewives and other adults who wish to upgrade or acquire knowledge through studies in various fields; [1(a)] (b) To strengthen and diversify the degrees, diploma and certificate courses at various educational levels, to fulfill the knowledge, skills and development needs of the individuals, institutions and society in general, by relating, particularly, the courses, to the needs of the employment and economic development of the state on the basis of its natural and human resources; [1(b)] (c) To promote acquisition of knowledge in a rapidly developing and changing society and to continually offer opportunity of upgrading knowledge, training and skills in the context of innovations, research and discovery in all field of human endeavor by developing educational network with the use of modern communication media and technologies appropriate for a learning society; [1(c)] (d) To provide an innovative system of University level education, flexible and open, in regard to the methods and pace of learning, combination of courses, eligibility for enrolment, age of entry, conduct of examinations and operation of the program, with a review to promote learning and encourage excellence in all fields of knowledge; [1(d)] (e) To contribute to the improvement of the education system in the state by providing a non-formal channel complementary to the formal system and encouraging transfer of credits and exchange of teaching staff by making a wide use of text and other software developed by the University; [1(e)] (f) To develop innovative, need based Vocational courses and establish industry, institution linkage for developing the society; [1(f)] (g) To provide through incidental and non-formal means, for continuing and extension of education in various cultural forms, arts, crafts and skills of the country, raising their quality and improving their availability to the people; [1(g)] (h) To provide for the counseling and guidance to its learners; [1(j)] (i) To provide major part of its resources and direct efforts in designing, developing and offering need-based and relevant vocational courses. [1(l)]
c	Nature of prospective target group of learners	A candidate who has passed 12th / (10+2)th / Level 4.0 examination conducted by Maharashtra State Board of Secondary and Higher Secondary Education/CBSE/ ISC/NIOS or equivalent examinations by any Other State or any other recognized Board with Science Subjects, including English and Mathematics OR A candidate who has passed (10+3) years or (12+2) years Engineering Diploma, from Maharashtra State Technical Board / a statutory or recognized board/ university in India Although similar UG Programme are offered by conventional institutes, the conventional educational system offers very little freedom to learners as regards when, where, and how to learn. The proposed programme aims to provide this freedom to learners to the maximum possible extent.

d	Appropriateness of programme to be conducted in Open and Distance Learning mode to acquire specific skills and competence Specify the expected learning outcomes in terms of: 1. Knowledge Attainment: 2. Skills and Competencies: Compliances of academic, professional & occupational standards:	The proposed programme is designed in adherence to the principles of National Education Policy (NEP2020) to acquire knowledge and skills with valuable experiences through VSC, SEC, AEC, VEC, IKS, hands-on activities, projects, internships and much more. This aims to provide relevant skills as needed by the working professional to identify and solve challenging problems in Mathematics, thus contributing to the ever-increasing demands of society and industry. The programme helps to develop scientific tempers and attitudes, which in turn can prove beneficial for society since scientific developments can make a nation or society grow at a rapid pace. After studying this programme, learners will be better equipped to learn and have a deep understanding of key Mathematics concepts, principles, and theories relevant to the field of Mathematics, analyze Mathematics formulae, and are prepared to take on leadership roles in Mathematics, governmental agencies, research institutions, and industries related to Mathematics. This programme uses the Open and Distance (ODL) mode of education in compliance with the objective 'reach to unreach' by offering: Theory, Practical, Term-work, Field Project/OJT, courses. The teaching-learning component is offered as face-to-face counseling along with full practical and project-work activities by qualified and experienced teacher/ mentors/experts at a recognized Learner Support Center (LSC), along with continuous assessment, and offline materials and resources in printed book format or soft copy format. The UGC recently introduced a 'virtual laboratory' approach for practical courses. This university is currently working on implementing this for the proposed laboratory activities in science courses. Additionally, this programme adheres all of the prevalent academic norms and standards of the UGC-DEB. Hence, this programme is appropriate to conduct in open and distance learning modes to provide an opportunity for those aspirants who cannot take traditional education but want to improve their existing science skills and/or to acquire specified skills and competencies.
e	Instructional Design **1.** Curriculum Design **(*Outcome of Expert Committee meeting; Program Structure: specify the theory, practical, fieldwork,***	This B.Sc. (Honours) programme for undergraduates is well structured based on the NEP 2020 framework. The entire curriculum is well organized and thoughtfully designed, featuring an updated syllabus. The four-year B.Sc. (Honours) programme consists of 176 credits distributed over eight semesters, with learners required to complete 22 credits in each semester. The modular structure of the curriculum allows for multiple entry and exit options. After successfully completion of 1 to 6 semesters, learners will be awarded a three-year Bachelor of Science (B.Sc.) degree with 132 credits and if learner continue next two semester 7 and 8 then will be awarded a four-year Bachelor of Science (B.Sc.) (Honours) degree with 176 credits. These credits will be distributed among Major Courses (DSC & DEC)), Minor courses, Open Electives (OEs), Ability Enhancement Courses (AEC), Skill Enhancement Courses (SEC), Value Education Courses (VEC), Indian Knowledge System (IKS), On Job Training (OJT), Field projects (FP), Co-curricular Courses (CC), Research Methodology (RM) etc. Among all offered courses, learners have to opt the courses as per NEP2020 guidelines.

***project, etc components*):**

2. Total Credit Points (*including course wise*):
3. Detailed Syllabi:
4. Duration of the program **(*Minimum & Maximum*):**
5. Medium of Instruction:
6. Type of Program **(*General/Technical/ Professional*):**
7. Faculty and Support Staff:
8. Instructional Design & Delivery Mechanism **(*Media to be used -print, audio, video, online, computer aided, web based, etc. (course wise)*):**

Student Support Service System **(*Specify the provisions to be made at Head Quarter, Regional Centers, Learner Support Centers and Web based, etc*):**

Semester pattern: This programme is of total 8 semesters. Distribution of the credits are as follows :

Sem	Mandatory Courses (DSC)				Elective Courses (DSE) (4 CR)	Minor Courses (2CR)		Open Elective OE (2CR)	VSC, SEC (VSEC) (2CR)		AEC, VEC, IKS (2/4 CR) (T)		OJT, FP, CEP, CC (2/4 CR)	Total Courses (CR)
	Theory (T)		Practical (P)											
	4 CR	2 CR	4 CR	2 CR		T	P	T	T	TW/P	2 CR	4 CR		
I	1	-	-	1	-	-	-	2	-	2	3	-	CC (2 CR)	10 (22 CR)
II	1	-	-	1	-	1	-	2	-	2	2	-	CC (2 CR)	10 (22 CR)
Cum Cr.	12				00	02		08	08		10		04	44
Exit option: Award of UG Certificate in Faculty of Science - Mathematics (Level 4.5) as Major with 44 credits and an additional 4 credits core NSQF course/ Internship OR Continue with Major and Minor														
III	1	1	-	1	-	1	1	1	-	1	1	-	FP (2 CR) CC (2 CR)	10 (22 CR)
IV	1	1	-	1	-	1	1	1	1	-	1	-	CEP (2 CR) CC (2 CR)	10 (22 CR)
Cum Cr.	28				00	10		12	12		14		12	88
Exit option: Award of UG Diploma in Faculty of Science - Mathematics (Level 5.0) with 88 credits and an additional 4 credits core NSQF course/ Internship OR Continue with Major and Minor														
V	1	1	1	-	1	1	1	-	-	1	-	-	FP/ CEP (2 CR)	8 (22 CR)
VI	1	1	1	-	1	1	1	-	-	-	-	-	OJT (4CR)	7 (22 CR)
Cum Cr.	48				08	18		12	14		14		18	132
Exit option: Award of UG Degree in Mathematics (Level 5.5) as Major with 132 credits OR Continue with Major and Minor														
VII	2	1	1	-	1	1 (4 CR)		-	-	-	-		-	6 (22 CR)
VIII	2	1	1	-	1	-		-	-	-	-		OJT (4CR)	6 (22 CR)
Cum Cr.	76				16	22		12	14		14		22	176
Four Year UG Honours Degree in Mathematics as Major and XXX as Minor with 176 Credits														

Programme Structure:

SN	Course Category	Code	Course Name	CA	EE	TM	Type	CR	Min %
[Level 4.5] Semester I : 22 Credits									
01	DSC	MATC101	Fundamentals of Mathematics	30	70	100	T	4	40%
02	DSC	MATC102	Basics of Statistics	25	25	50	P	2	40%

03	OE	XXXE101	Select from other faculty OE courses List	15	35	50	T	2	40%
04	OE	XXXE102	Select from other faculty OE courses List	15	35	50	T	2	40%
05	VSC	MATV101	Introduction to GeoGebra	25	25	50	TW	2	40%
06	SEC	SECS101	Basic Instrumentation Skills	25	25	50	TW	2	40%
07	AEC	AECL101	Listening and Speaking Skills in English	15	35	50	T	2	40%
08	VEC	VECD101	Introduction to the Constitution of India	15	35	50	T	2	40%
Select Any one from IKSK101 to IKSK105									
09	IKS	IKSK101	भारतीय ज्ञान परंपरा – कला आणि प्राचीन भारतीय भाषा	15	35	50	T	2	40%
		IKSK102	भारतीय ज्ञान परंपरा – सामाजिक शास्त्रे	50	TW	2	40%	50	TW
		IKSK103	भारतीय ज्ञान परंपरा – आरोग्य शास्त्र	50	TW	2	40%	50	TW
		IKSK104	भारतीय ज्ञान परंपरा – विज्ञान आणि तंत्रज्ञान	50	TW	2	40%	50	TW
		IKSK105	Indian Knowledge System – Generic (Offered in Online Mode)	50	TW	2	40%	50	TW
Select Any one from CCRX101 to CCRX106									
10	CC	CCRX101	Health and Wellness-I	50	-	50	TW	2	40%
		CCRX102	Yoga Education-I	50	-	50	TW	2	40%
		CCRX103	Sports and Fitness-I	50	-	50	TW	2	40%
		CCRX104	Cultural Activities-I	50	-	50	TW	2	40%
		CCRX105	NSS-I	50	-	50	TW	2	40%
		CCRX106	Fine/Applied/Visual/Performing Arts-I	50	-	50	TW	2	40%
[Level 4.5] Semester II : 22 Credits									
11	DSC	MATC103	Calculus	30	70	100	T	4	40%
12	DSC	MATC104	Practical Based on MATC103	25	25	50	P	2	40%
13	Minor	XXXM101	To be Selected from Minor Courses List **other than Major (DSC)**	15	35	50	T	2	40%
14	OE	XXXE103	Select from other faculty OE courses List	15	35	50	T	2	40%
15	OE	XXXE104	Select from other faculty OE courses List	15	35	50	T	2	40%
16	VSC	MATV102	Programming in Python	25	25	50	TW	2	40%
17	SEC	SECS102	MS-Excel with AI	25	25	50	TW	2	40%
18	AEC	AECL102	Reading and Writing Skills in English	15	35	50	T	2	40%

19	VEC	VECD102	Environmental Education	15	35	50	T	2	40%
Select Any one from CCRX107 to CCRX112									
20	CC	CCRX107	Health and Wellness-II	50	-	50	TW	2	40%
		CCRX108	Yoga Education-II	50	-	50	TW	2	40%
		CCRX109	Sports and Fitness-II	50	-	50	TW	2	40%
		CCRX110	Cultural Activities-II	50	-	50	TW	2	40%
		CCRX111	NSS-II	50	-	50	TW	2	40%
		CCRX112	Fine/Applied/Visual/Performing Arts-II	50	-	50	TW	2	40%
Exit option: Award of UG Certificate in The Faculty of Science-Mathematics (Level 4.5) with 44 credits and an additional 4 credits core NSQF course/ Internship OR Continue with Major and Minor									
[Level 5.0] Semester III: 22 Credits									
21	DSC	MATC201	Calculus of Several Variables	30	70	100	T	4	40%
22	DSC	MATC202	Ancient Indian Mathematics	15	35	50	T	2	40%
23	DSC	MATC203	Coordinate Geometry	25	25	50	P	2	40%
24	Minor	XXXM201	To be Selected from Minor Courses List **other than Major (DSC)**	15	35	50	T	2	40%
25	Minor	XXXM202	To be Selected from Minor Courses List **other than Major (DSC)**	25	25	50	P	2	40%
26	OE	XXXE201	Select from other faculty OE courses List	15	35	50	T	2	40%
27	VSC	MATV201	R Programming	25	25	50	P	2	40%
28	AEC	AECL201	श्रवण आणि संभाषण कौशल्ये	15	35	50	T	2	40%
29	FP	MATF204	Field Project	50	-	50	TW	2	40%
Select Any One from CCRX201 to CCRX206									
30	CC	CCRX201	Healt□ and Wellness-III	50	-	50	TW	2	40%
		CCRX202	Yoga Education-III	50	-	50	TW	2	40%
		CCRX203	Sports and Fitness-III	50	-	50	TW	2	40%
		CCRX204	Cultural Activities-III	50	-	50	TW	2	40%
		CCRX205	NSS-III	50	-	50	TW	2	40%
		CCRX206	Fine/Applied/Visual/Performing Arts-III	50	-	50	TW	2	40%
[Level 5.0] Semester IV: 22 Credits									
31	DSC	MATC205	Linear Algebra	30	70	100	T	4	40%
32	DSC	MATC206	Complex Variables	15	35	50	T	2	40%

		33	DSC	MATC207	Practical Based on MATC205 & MATC206	25	25	50	P	2	40%
		34	Minor	XXXM203	To be Selected from Minor Courses List **other than Major (DSC)**	15	35	50	T	2	40%
		35	Minor	XXXM204	To be Selected from Minor Courses List **other than Major (DSC)**	25	25	50	P	2	40%
		36	OE	XXXE202	Select from other faculty OE courses List	15	35	50	T	2	40%
		37	SEC	SECS201	Intellectual Property Rights	15	35	50	T	2	40%
		38	AEC	AECL202	वाचन आणि लेखन कौशल्ये	15	35	50	T	2	40%
		39	CEP	MATG208	Awareness of Sustainable Development Goals- I	50	-	50	TW	2	40%
		Select Any One from CCRX207 to CCRX212									
		40	CC	CCRX207	Health and Wellness-IV	50	-	50	TW	2	40%
				CCRX208	Yoga Education-IV	50	-	50	TW	2	40%
				CCRX209	Sports and Fitness-IV	50	-	50	TW	2	40%
				CCRX210	Cultural Activities-IV	50	-	50	TW	2	40%
				CCRX211	NSS-IV	50	-	50	TW	2	40%
				CCRX212	Fine/Applied/Visual/Performing Arts-IV	50	-	50	TW	2	40%
		Exit option: Award of UG Diploma in in the Faculty of Science-Mathematics (Level 5.0) with 88 credits and an additional 4 credits core NSQF course/ Internship OR Continue with Major and Minor									
		[Level 5.5] Semester V: 22 Credits									
		41	DSC	MATC301	Differential Equations	30	70	100	T	4	40%
		42	DSC	MATC302	Real Analysis	15	35	50	T	2	40%
		43	DSC	MATC303	Programming in MATLAB	50	50	100	P	4	40%
		Select Any One from MATC304, MATC305, MATC305									
		44	DSE	MATC304	Graph Theory	30	70	100	T	4	40%
			DSE	MATC305	Dynamical Systems	30	70	100	T	4	40%
			DSE	MATC306	Analytical Geometry	30	70	100	T	4	40%
		45	Minor	XXXM301	To be Selected from Minor Courses List **other than Major (DSC)**	15	35	50	T	2	40%
		46	Minor	XXXM302	To be Selected from Minor Courses List **other than Major (DSC)**	25	25	50	P	2	40%
		47	VSC	MATV301	LaTeX	25	25	50	TW	2	40%
		Select any one from MATF307 or MATG308									
		48	FP	MATF307	Field Project	50	-	50	TW	2	40%

	CEP	MATG308	Awareness of Sustainable Development Goals - II	50	-	50	TW	2	40%
[Level 5.5] Semester VI: 22 Credits									
49	DSC	MATC309	Metric Spaces	30	70	100	T	4	40%
50	DSC	MATC310	Group Theory	15	35	50	T	2	40%
51	DSC	MATC311	Mathematical Modelling	50	50	100	P	4	40%
Select Any One from MATC312, MATC313, MATC314									
52 52	DSE	MATC312	LPP and Game Theory	30	70	100	T	4	40%
	DSE	MATC313	Lattice Theory & Boolean Algebra	30	70	100	T	4	40%
	DSE	MATC314	Numerical Analysis	30	70	100	T	4	40%
53	Minor	XXXM303	To be Selected from Minor Courses List **other than Major (DSC)**	15	35	50	T	2	40%
54	Minor	XXXM304	To be Selected from Minor Courses List **other than Major (DSC)**	25	25	50	P	2	40%
55	OJT	MATO315	On Job Training	50	50	100	TW	4	40%
Exit option: Award of UG Degree in Mathematics (Level 5.5) with 132 credits OR Continue with Major and Minor									
[Level 6.0] Semester VII: 22 Credits									
56	DSC	MATC401	Real Analysis	30	70	100	T	4	40%
57	DSC	MATC402	Abstract Algebra	30	70	100	T	4	40%
58	DSC	MATC403	Ordinary Differential Equations	15	35	50	T	2	40%
59	DSC	MATC404	Programming in C and Scilab	50	50	100	P	4	40%
60	RM	RESR405	Research Methodology	30	70	100	T	4	40%
Elective (DSE)Courses (Select Any One)									
61	DSE	MATC406	Operations Research	30	70	100	T	4	40%
	DSE	MATC407	Numerical Analysis	30	70	100	T	4	40%
[Level 6.0] Semester VIII: 22 Credits									
62	DSC	MATC409	Topology	30	70	100	T	4	40%
63	DSC	MATC410	Linear Algebra	30	70	100	T	4	40%
64	DSC	MATC411	Partial Differential Equations	15	35	50	T	2	40%
65	DSC	MATC412	LaTeX and Programming in SageMath	50	50	100	P	4	40%
66	OJT	MATO413	OJT	50	50	100	TW	4	40%
Elective (DSE)Courses (Select Any One)									

67	DSE	MATC415	Number Theory	30	70	100	T	4	40%
	DSE	MATC416	Field Theory	30	70	100	T	4	40%

Four Year UG Honours Degree in Mathematics as Major and XXX as Minor with 176 Credits

Minor Courses offered in Mathematics discipline for other discipline of same faculty or different faculty :

For example, here Science is faculty and Mathematics is discipline.

a) These minor courses may be selected by learners who have not selected Mathematics as Major

SN	Course	Code	Name	CA	EE	TM	Type	CR	Min%
Semester II									
01	Minor	MATM101	Foundation of Mathematics	15	35	50	T	2	40%
Semester III									
02	Minor	MATM201	Fundamentals of Calculus	15	35	50	T	2	40%
03	Minor	MATM202	Practical Based on MATM201	25	25	50	P	2	40%
Semester IV									
04	Minor	MATM203	Applied Linear Algebra	15	35	50	T	2	40%
05	Minor	MATM204	Practical Based on MATM203	25	25	50	P	2	40%
Semester V									
06	Minor	MATM301	Introductory Differential Equations	15	35	50	T	2	40%
07	Minor	MATM302	Practical Based on MATM301	25	25	50	P	2	40%
Semester VI									
08	Minor	MATM303	Numerical Methods	15	35	50	T	2	40%
09	Minor	MATM304	Practical Based on MATM303	25	25	50	P	2	40%

b) Mathematics learners may select minor courses from the following discipline:

SN	**Major in:**	**Minor in (Anyone of the following other than Major)**: Refer **Annexure - I**
1	**Mathematics**	Physics, Chemistry, Botany, Zoology, Environmental Science

Open Elective (OE) Courses in Mathematics offered for other Faculty:

SN	Course	Code	Name	CA	EE	TM	Type	CR	Min %
Semester I									
01	OE	MATE101	Mathematics for Competitive Exam	15	35	50	T	2	40%
02	OE	MATE102	Logical Reasoning and Data Interpretation	15	35	50	T	2	40%
Semester II									
03	OE	MATE103	Mathematics for Quantitative Aptitude	15	35	50	T	2	40%
04	OE	MATE104	Statistics for Research	15	35	50	T	2	40%
Semester III									
05	OE	MATE201	Mathematics for Finance	15	35	50	T	2	40%
Semester IV									
06	OE	MATE202	Basics of Actuarial Science	15	35	50	T	2	40%

Total Credits: **132** and **Total Courses**: **55** {3Y UG degree}
Total Credits: **176** and **Total Courses**:**67** {4Y UG degree}

Detailed Syllabi: Available at
https://drive.google.com/drive/folders/13lNyj1PT7qN-AAAi2eE8fwDAsCQFWMQz?tid=0B451Yjwt_acQR1VPSUQ4Qotvams

- Programme Outcomes and Courses Outcomes: Refer Annexure – II

Minimum programme duration:
- 3 yrs {for 3Y UG degree} and 4 yrs {4Y UG (Honours) degree}

Maximum Programme Duration:
- 6 yrs {for 3Y UG degree} and 8 yrs {4Y UG (Honours) degree}

Medium of Instruction: English

Type of Program: General

Faculty and Support Staff:

Director, School of Sciences: Dr. Chetana Kamlaskar
Academic coordinator: Ms. Tejaswi Kadam

Instructional Design & Delivery Mechanism:

In order to ensure and maintain the quality in science education, face-to-face counseling for theory and activities type of courses will be conducted at the designated LSCs during Saturdays and Sundays.

- **Minimum number of face-to-face counseling sessions:** 12 (for 4 Credits)
  - (For each theory type of course of 4 credits duration of each counseling session shall be 01 Clock Hour)
  - (For each Practical/Project type of course of 4 credits duration of each counseling session shall be 02 Clock Hour).
- **Minimum number of face-to-face counseling sessions:** 6 (for 2 Credits)
  - (For each theory type of course of 2 credits duration of each counseling session shall be 01 Clock Hour)

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- (For each Practical/Termwork type of course of 2 credits duration of each counseling session shall be 02 Clock Hour).
• Number of On Job Training (OJT) hours: 120 hr (for 4 Credits)
- One month ‘On Job Training (OJT)’ or Internship (Total Study hours 120 hrs including Internship Report)
• Required study efforts:
1. For 3Y UG degree: Total 3960 Hours including Self-Study during all 06 semesters. 660 Hours (including Self-Study) during each semester.
2. For 4Y UG (Honours) degree: Total 5280 Hours including Self-Study during all 08 semesters. 660 Hours (including Self-Study) during each semester.
• Attendance: Minimum 80% attendance recommended for all activity type of courses
• eBook: eBook in SLM format for each course (Free Download from University website) at all semesters I to semester VIII
Student Support Service System:
At headquarter: Support from School, SSD, Evaluation Division and Exam Unit-3
At Regional Centers: From all 8 regional centers within MH
At Learner Support Centers: Recognized Learner support centers within MH
Web Based:
http://www.ycmou.ac.in
http://ycmou.digitaluniversity.ac
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<td>Procedure for admissions, curriculum transaction and evaluation
1. Define the Admission Policy (including web based tools to be adopted:
2. Eligibility Criteria:
3. Fee Structure:
4. Financial assistance to Learners</td>
<td>
All information related to the programme like admission policy, eligibility and fee structure, course curriculum, medium of instruction, evaluation policy - online home assignments and end examination pattern, SLMs etc. are transacted through prospectus, university website and official notification.
Admissions procedure: A customized “Online Annual Admission system” available at DU portal
http://ycmou.digitaluniveristy.ac
Online payment facility is made available using a credit card or debit card or internet banking.
Admission Eligibility: 12th / (10+2)th / Level 4.0 examination conducted by Maharashtra State Board of Secondary and Higher Secondary Education/CBSE/ ISC/NIOS or equivalent examinations by any Other State or any other recognized Board with Science Subjects Pass, including English and Mathematics
OR
(10+3) years or (12+2) years Engineering Diploma Pass, from Maharashtra State Technical Board / a statutory or recognized board/ university in India
For details Refer Entry level Eligibility Criteria
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<tr><th>SN</th><th>Academic Qualifications required for Eligibility</th></tr>
<tr><td>A)</td><td>A candidate who has passed Standard 12th / (10+2)th / Level 4.0 examination conducted by Maharashtra State Board of Secondary and Higher Secondary Education/CBSE/ ISC/NIOS or equivalent examinations by any Other State or any other recognized Board with</td></tr>
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(if any):

5. Activity planner of all academic activities of the academic session:
6. Exit Option- UG Certificate UG Diploma, UG Degree:

Policy for Evaluation of learner progress along with methods and tools:

	science subjects shall be eligible for admission to First Semester B. Sc. Programmes as per NEP 2020:		
	Groups of Science subjects/courses from		**Eligible for Any One Major in Science Discipline**
1.	1. English 2. Physics, Chemistry, Mathematics, Biology		**Any One Major from**: Physics, Chemistry, **Mathematics**, Botany, Zoology, Environmental Science
2.	1. English 2. Physics, Chemistry, Mathematics		**Any One Major from:** Physics, Chemistry, **Mathematics**, Environmental Science
3.	1. English 2. Physics, Chemistry, Biology		**Any One Major from**: Physics, Chemistry, Botany, Zoology, Environmental Science
4.	1. English 2. Vocational Course of 200 Marks 3. Physics, Chemistry, Mathematics		**Any One Major from:** Physics, Chemistry, **Mathematics**, Environmental Science
5.	1. English 2. Vocational Course of 200 Marks 3. Physics, Chemistry, Biology		**Any One Major from**: Physics, Chemistry, Botany, Zoology, Environmental Science
6.	1. English 2. Physics, Chemistry	3. Any one of the following Optional Course of 100 Marks: Geography, Geology, Food Science and Technology, Agriculture Science and Technology, Animal Science and Technology, Defence Studies	**Any One Major from**: Physics, Chemistry, Environmental Science
		3. Any one of the following Optional Course of 100 Marks: Food Science and Technology, Agriculture Science	**Major**: Botany
		3. Optional Course of 100 Marks: Animal Science and Technology	**Major**: Zoology
	OR		
B)	A candidate who has passed (10+3) years or (12+2) years Diploma from Maharashtra State Technical Board / a statutory or recognized board/ university in India		
	Description		**Eligible for Any One Major in Science Discipline**
1.	(10+3) years / (12+2) years Engineering Diploma		**Any One Major from:** Physics, Chemistry, **Mathematics**, Environmental Science
	OR		
C)	A candidate who has passed Higher Secondary School Certificate		

	(10+2) Examination with English and any of the following +2 Level HSC Vocational (MCVC) Group		
	HSC Vocational (MCVC) Group		**Eligible for Any One Major in Science Discipline**
1.	Agriculture Group or Fisheries Group	Horticulture (KA, KB, KC)	**Any One Major from:** Botany, Environmental Science
		Crop Science (LA, LB, LC)	
		Animal Husbandry and Dairy Technology (MA, MB, MC)	**Any One Major from:** Zoology, Environmental Science
		Fisheries Technology (NA, NB, NC)	
2.	Catering and Food Products Technology	Catering and Food Products Technology (SA, SB, SC)	**Any One Major from:** Botany, Zoology, Environmental Science
3.	Paramedical Group	Child, Old Age and Health care services (QA, QB, QC)	**Any One Major from:** Botany, Zoology, Environmental Science
		Medical Laboratory Technician (OA, OB, OC)	**Any One Major from:** Physics, Chemistry, Zoology
		Ophthalmic Technician (RA, RB, RC)	**Major:** Physics
		Radiology Technician (PA, PB, PC)	
4.	Technology Group	Electronics Technology (EA, EB, EC)	**Major:** Physics
		Electrical Technology (FA, FB, FC)	

Total programme Fee: Total ₹ 28,724/- for all 06 Semesters and Total ₹ 52,292/- for all 08 Semesters, which is duly approved by the university authorities [*Will be updated as per University Policy decision*]

Curriculum Transaction:

- 01 SLM e-Book will be developed for each theory course
- Total 12/06 Face-To-Face counseling sessions, each of 60 Minutes duration, will be provided at respective learner support center, for each theory course.
- Total 12/18 Face-To-Face counseling sessions, each of 120 Minutes duration, will be provided at respective learner support center, for each practical/Field project/ OJT/ CC courses. In the laboratory, instruction would be given for the experiments followed by demonstration and finally the learners have to do the experiments individually.
- Curriculum updation will be after every 3 years

Activity planner: This University and School will follow the Programme Calender declared by UGC/DEB, New Delhi time to time. Teaching-Learning of students shall start from 01-September/01-Feb every year.

Online continuous assessment proposed for all offered programmes.

SN	Activity Description	Yearly Pattern/ Odd semesters like 01, 03, 05 and 07 From 01-Sep Till 31-Jan	Even semesters like 02, 04, 06 and 08 From 01-Feb Till 31-Jul
Online Admission: offered on Annual basis for 2 semesters in each academic year. Only for 'C149: Certificate progarmme in Beekeeping', Admissions shall be offered on Winter and Summer batch basis.			
01	Fresh and Further Yearly Admission	From 1st June 2025 Till Sept 2025 (For C149, Winter Batch: From Jul)	NA (For C149, Summer Batch: From Jan)
Teaching – Learning at the resp Learning Support Centers/ SCs for all Theory, Practical, Term-Work, Studio, Project, FP & OJT Courses			
02	Teaching – Learning (16 Weeks) & Backlog Clearing	**From 1st Sept 2025 Till 14th Dec 2025**	**From 18th Jan 2026 Till 19th April 2026**
Online End Exam (EE) Form Submission (Required only for Repeater Students)			
03	**Online** EE Form Submission by SCs/ students at University	On or Before 21-Oct	On or Before 23-Apr
Continuous Assessment (CA) Submission			
04	CA Availability	August 2025	March 2025
05	CA Submission by Students	Upto last week of Dec 2025	Upto first week of Apr 2026
End Examination (EE) (Required only for Non-Repeater Students)			
07	**Online** EE Form Submission by SCs/ students at University	Upto third week of Oct 2025	Upto first week of Apr 2026
07	**End Exam for Theory Courses**	**From first week of Jan 2026**	**From first week of May 2026**
08	EE for Activity Courses (Pr, TW, PW, STW, SV)	Immediately after/ before the schedule of the end exam for theory courses, but positively before **1st Dec 2025 to 31st Dec 2025**	Immediately after/ before the schedule of the end exam for theory courses, but positively before **10th Apr 2026 to 10th May 2026**
09	OJT/Field Project (Completion Report/Presentation/Viva)	After Winter exam - Within One Month	After Summer exam - Within One Month

10	End Exam Result Declaration	Within 45 days from the last day of End Exam	Within 45 days from the last day of End Exam
Semester End Vacation			
10	Semester End Vacation	Jan	July

Policy:
Refer Evaluation pattern given in Annexure III.
For exit option:

1. **Multiple Entry Multiple Exit Option**:
   Compliance with MS G.R. No. NEP-2022/CR No. 09/VISHI-3/शिकाना, dated 20April, 2023.

Level of the Programme	Entry Option (with criteria)	Exit Option (with criteria)
Certificate Level	12th / (10+2)th / Level 4.0 examination conducted by Maharashtra State Board of Secondary and Higher Secondary Education/CBSE/ ISC/NIOS or equivalent examinations by any Other State or any other recognized Board with Science Subjects Pass, including English and Mathematics **OR** (10+3) years or (12+2) years Engineering Diploma Pass, from Maharashtra State Technical Board / a statutory or recognized board/ university in India	Award of UG Certificate in the Faculty of Science - Mathematics (Level 4.5) with 44 credits and an additional 4 credits core NSQF course/ Internship.
Diploma Level	UG Certificate in the Faculty of Science – Mathematics (Level 4.5) with 40-44 credits	Award of UG Diploma in the Faculty of Science – Mathematics (Level 5.0) with 88 credits and an additional 4 credits core NSQF course/ internship

		Degree Level	UG Diploma in the Faculty of Science – Mathematics (Level 5.0) with 88 credits	Award of UG Degree Mathematics with 132 credits
g	Requirement of the Laboratory Support and Library Resources: 1. Laboratory Support to the learners (*if any*): 2. Provision of Practical book for learners (*if any*): Provision of Virtual Reality Methods for Practical in case of Online learning (*if any*):	Laboratory requirement and Library Resources – Yes. Being mandatory requirement of the programme, Institutes/Colleges affiliated with conventional university offering B.Sc. (Mathematics) will be only recognized as a Learner support center of this university for this programme. So, requirement of laboratory support and library resources will be automatically ensured. Additionally, school provides practical workbook in the form SLM book and other learning resources to all enrolled learners. University has already initiated in-house Science Laboratory development task at HQ, these labs will be made available to the enrolled learners in future. **Recommended**: Recognized LSCs with • Computer infrastructure with Wi-Fi/broadband connection with Mathematics related software/tool and Library facilities		
h	Cost Estimate of the Program and the Provisions: Indicate the Budgetary Requirement for: 1. Programme Development 2. Program Delivery Program Maintenance	Budget provision for this development under A.27.P.38: Fees/Royalties/ Honorarium to Writer/Editors/Trans. SLM development cost: approximately ₹ 60,00,000/-		
i	Quality Assurance Mechanism and expected Program Outcomes*: 1. Define the Review Mechanism of the Program for enhancing the standards of curriculum, instructional design relevant to	B.Sc. (Honours) programme is designed to provide scientific as well as professional level competency to learners, and offers advanced theoretical as well as practical knowledge to learners. This programme enables the learner to develop interest in knowing more about the Mathematics and to develop research attitude. University has policy to review and revise every course at least once in five years of its launching. **Quality Assurance Mechanism**: The following key result areas will be closely monitored. • Well qualified and experienced experts nomination on Programme Advisory Committee(PAC) for design and development of relevant course content • Well qualified subject experts for SLM development and Evaluation task • Enrolment of student (Equated Access) • Equal weightage for each credit in learner evaluation		

	professional requirements: 2. Define Program Benchmark Statements: 3. Mechanism for Monitoring the effectiveness of the program: ***(Minimum standards must adhere to "UGC Open and Distance Learning Programmes and Online Programmes Regulations, 2020" & directions of the Statutory Bodies of the University)**	• Demonstrate in-depth knowledge of Physics, both in theory and practical • Examination Results • Placements/satisfaction of passing out students • Administrative/stakeholder feedback • Centre for Internal Quality Assurance (CIQA) to ensure quality of offered science programmes **Expected Program Outcomes:** After successful completion of this programme, students will be able to • Demonstrate interdisciplinary competence by applying principles from Mathematics to solve real-world problems. • Exhibit a profound understanding of core concepts and theories in Mathematics. • Excel in critical thinking and problem-solving, addressing complex issues that span both major and minor disciplines of Mathematics. • Demonstrate proficiency in programming techniques, enabling the design, development, and execution of programs using R, Python, and LaTeX. • Engage in interdisciplinary research projects and contribute to scientific advancements in Mathematics discipline. • Communicate scientific findings effectively, both in written reports and oral presentations. • Adhere to ethical standards and academic integrity in research and experimentation of science faculty. • Adapt to diverse career opportunities in Mathematics discipline, showing flexibility in their choice of career paths. • Collaborate effectively in multidisciplinary teams, displaying leadership and teamwork skills. • Stay informed about contemporary scientific issues, including their societal implications.

B. **Duration & Nomenclature**

Name of Programme:-	4 year Bachelor of Science (Honours) (Mathematics)
Medium	English
Year	2026-27
Level	UG Level 4.5
Academic Session	July Onwards
Entry Qualification (as per the Specification of Degrees, 2014)	12th / (10+2)th / Level 4.0 examination conducted by Maharashtra State Board of Secondary and Higher Secondary Education/CBSE/ ISC/NIOS or equivalent examinations by any Other State or any other recognized Board with Science Subjects Pass, including English and Mathematics **OR** (10+3) years or (12+2) years Engineering Diploma Pass, from Maharashtra State Technical Board / a statutory or

	recognized board/ university in India
Duration (as per the Specification of Degrees, 2014)	4 Year
Name of the Department	School of Sciences

C. **Mode of Evaluation**

Year	2026-27
Whether Weightages to continuous assessment and end semester examinations or term end examinations as per clause mentioned in Regulations	Yes 1. 30% - 70% weightage Pattern for theory 2. 50% - 50% Weightage pattern for Practical/OJT/VSC/SEC* * only one SEC course is Theory type 3. 100% Weightage to Continuous Assessment for FP/ CC/CEP courses
Examination Scheme	Formative and Summative
Percentage of Continuous Assessment (%)	Theory: 30% Practical/OJT /VSC/SEC* (* only one SEC course is Theory type): 50% CC/CEP/FP: 100% Passing %: 40 %
Percentage of Term End Examination (%)	Theory: 70% Practical/OJT/VSC/SEC*/ (* only one SEC course is Theory type): 50% Passing %: 40 %
Pass or Fail Criteria	40% for Pass
Pass/Fail Criteria (% Pass Marks)	40% and above - Pass Below 40 % - Fail

D. Mode of Examination

Whether examination through Online(For ODL Programs)	No

E. SLM Development (Submit all SLM in pdf in pendrive and prepare the SLM availability sheet in the order as per sample in pdf for each program separately)

Particulars	% SLM in house developed	% SLM in collaboration with with HEI (It should not be more than 40% of total SLM. If it is in collaboration then provide MOU in Soft & Hard copy
Printing Material	100%	–
Audio-Video Material	-	–
Online Material	Yes [pdf of SLMs]	–
Compute based Material	–	–

F. Program wise faculty details (Requirement of Minimum three faculty not below the rank of Assistant Professor to be furnished in the following format – to be taken from Establishment

Sr. No.	Emp. No	Name of the Faculty	Designation	Date of Joining	Qualification	Specialization	Teaching experience	Address	Phone no	Email	Appointment letter
1	Y0907	Ms. Tejaswi Kadaam	Academic Coordinator	12/10/2018	M.Sc. Mathematics SET	Mathematics	06 Years	YCMOU	9527359061	kadam.tv@ycmou.ac.in	
2											

G. List of Learner Support Centres Program wise and Region wise to be submitted as per following format. (We have intimated the same to Director SSD. **You are requested to give him the list of programs for which the LSCs data is required.**) – to be taken from SSD Director

Sr. No	Study centre code	Name & Address of LSC	Name of the HEI to which college/Institute is affiliated (where LSC is established)	Whether the College /Institute Private or Govt. (where LSC is established)	Name and Contact Details of Coordinator/ counsellor :	Qualification of Coordinator/ Counsellor :	No. of Counsellor :	Name of Proposed Programmes/ Course from July, 2023 onwards:	Approved	Not Approved with Reason

Annexure – I

Minor Courses offered from School of Sciences for other discipline of same faculty or different faculty

(Learner should select Any One Minor from the following verticals other than selected Mathematics as Major)

LEVEL	SEM	Credits	Course Type	Physics	Chemistry	Botany	Zoology	Environmental Science
4.5	II	2	T	**PHYM101:** Basics of Electricity & Magnetism	**CHEM101:** Basic of Physical Chemistry	**BOTM101**: Plant Diversity	**ZOOM101:** Animal Diversity of Invertebrates	**EVSM101:** Fundamentals of Environment
5.0	III	2	T	**PHYM201:** Thermal Physics	**CHEM201:** Introduction to Organic Chemistry	**BOTM201**: Morphology and Anatomy of Flowering Plants	**ZOOM201:** Principle of Ecology	**EVSM201:** Wildlife Biology
		2	P	**PHYM202:** Lab Activities on PHYM201	**CHEM202:** Lab Activities on CHEM201	**BOTM202:** Lab Activities on BOTM201	**ZOOM202:** Lab Activities on ZOOM201	**EVSM202:** Lab Activities on EVSM201
	IV	2	T	**PHYM203:** Oscillations & Optics	**CHEM203:** Introduction to Inorganic Chemistry	**BOTM203:** Plant Physiology	**ZOOM203:** Fundamentals of Cell Biology	**EVSM203:** Water & Noise Quality
		2	P	**PHYM204:** Lab Activities on PHYM203	**CHEM204:** Lab Activities on CHEM203	**BOTM204**: Lab Activities on BOTM203	**ZOOM204:** Lab Activities on ZOOM203	**EVSM204:** Lab Activities on EVSM203
5.5	V	2	T	**PHYM301:** Computational Physics	**CHEM301:** Advanced Physical Chemistry	**BOTM301:** Introduction to Cytology	**ZOOM301:** Introduction to Aquatic Biology	**EVSM301:** Air & Soil Quality
		2	P	**PHYM302:** Lab Activities on PHYM301	**CHEM302:** Lab Activities on CHEM301	**BOTM302:** Lab Activities on BOTM301	**ZOOM302:** Lab Activities on ZOOM301	**EVSM302:** Lab Activities on EVSM 301
	VI	2	T	**PHYM303:** Basics of Instrumentation	**CHEM303:** Introduction to Organic and Inorganic Chemistry	**BOTM303:** Plant Genetics and Variation	**ZOOM303:** General Parasitology	**EVSM303:** Environmental Governance
		2	P	**PHYM304**: Lab Activities on PHYM303	**CHEM304:** Lab Activities on CHEM303	**BOTM304:** Lab Activities on BOTM303	**ZOOM304:** Lab Activities on ZOOM303	**EVSM304:** Lab Activities on EVSM 303

Annexure – II

Programme Objectives, Scope of the Programme & Programme Outcomes (PO)

And

Course Outcomes (CO)

Programme Name: 4 Year Bachelor of Science (Honours) (Mathematics)		
1	**Programme Objectives**	This programme has the following broad objectives: • Access to Science Education: To provide science education opportunities through learner Open and Distance Learning (ODL), making learning accessible and cost effective. • Deep Understanding: To ensure that learners gain a deep understanding of the fundamental principles and concepts in Mathematics. • Problem-Solving Abilities: To equip students with problem-solving skills, enabling them to apply scientific methodologies to address complex issues that require expertise in Mathematics disciplines. • Research Aptitude: To nurture research aptitude by encouraging learners to engage in interdisciplinary research projects at the undergraduate level. • Effective Communication: To enhance communication skills, allowing learners to communicate scientific findings effectively, both in writing and orally. • Flexibility and Adaptability: To prepare learners for diverse career opportunities, including academia, research, industry, and entrepreneurship, by offering a versatile skill set. • Engage in life-long learning and will have recognition.
2	**Scope of the Programme**	After successful completion of this programme, learners may get opportunities in various fields/sectors to work as • Career opportunities in government organizations like Defense Research and Development Organization (DRDO), Indian Space Research Organization (ISRO), research laboratories like Council of Scientific and Industrial Research or government-owned scientific organizations. • Job positions like Mathematics Specialist, Quantitative Risk Analyst, Treasury Management Specialist, Public sector banking, financial institutions, Engineering or Insurance Sectors, etc. • Job opportunities in the teaching profession at Science and Engineering colleges, and Universities • Scope for Higher Studies and find lucrative opportunities in the field of research.
3	**Programme Outcome**	After successful completion of this programme, learners will be able to • Enhance their logical thinking and apply advanced mathematical concepts to solve complex problems.

<table>
<tr><td></td><td></td><td>

Formulate research questions, design experiments or investigations, collect and analyse data, and present their findings in a clear and coherent manner.
Apply advanced mathematical techniques and tools to analyse and solve challenging problems encountered in mathematics and related fields.
Formulate mathematical models that represent real-world phenomena, analyse the models using mathematical methods, and interpret the results to make informed decisions or predictions.
Develop proficiency in utilizing computational tools, software, and programming languages to aid in mathematical analysis, numerical simulations, and data visualization.
Present complex mathematical concepts, proofs, and research findings to both technical and non-technical audiences.
Develop a strong foundation for professional growth and lifelong learning in mathematics.

</td></tr>
<tr><td>4</td><td>Course Outcomes</td><td>
<table>
<tr><th>SN</th><th>Course Code & Name</th><th>Course Outcomes
After successful completion of the course, student should be able to</th></tr>
<tr><td colspan="3">Semester I</td></tr>
<tr><td>1</td><td>MATC101:
Fundamentals of Mathematics</td><td>• Identify and describe sets, relations, functions, and basic principles of mathematical logic.
• Solve problems involving greatest common divisors, least common multiples, and congruence relations.
• Analyze and solve systems of linear equations by applying matrix techniques such as finding the inverse and rank.
• Represent complex numbers geometrically, convert between rectangular and polar forms, and calculate nth roots of complex numbers.</td></tr>
<tr><td>2</td><td>MATC102:
Basics of Statistics</td><td>• Understand fundamental statistical concepts and apply them to real-life data.
• Perform essential data collection, organization, and analysis using statistical tools.
• Interpret statistical results to make informed decisions.
• Use statistical software or tools (like Excel) to carry out basic statistical computations.</td></tr>
<tr><td>3</td><td>MATV101:
Introduction to GeoGebra</td><td>• Gain hands-on experience with GeoGebra software.
• Use GeoGebra to model and solve mathematical problems.
• Demonstrate proficiency in geometric constructions, algebraic graphing, and basic calculus using GeoGebra.</td></tr>
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					• Improve their understanding of mathematical concepts through interactive exploration. • Create visual presentations of mathematical solutions using technology.
			4	**SECS101**: Basic Instrumentation Skills	• Demonstrate competence in using various instruments and equipment. • Safely conduct experiments and collect reliable data. • Analyze and interpret experimental results effectively. • Apply instrumentation skills in their respective fields of study and research. • Foster a culture of safety, ethics, and environmental responsibility in scientific work. • Identify, describe, and explain the function of various scientific instruments used in their respective field.
			5	**AECL101:** Listening and Speaking Skills in English	• Students will be able to identify, comprehend, and interpret main ideas and supporting details in spoken English across different contexts using active and critical listening strategies. • Students will demonstrate correct pronunciation, stress, and intonation in spoken English, showing increased fluency and confidence in both academic and social interactions. • Students will be able to initiate and sustain basic conversations using polite expressions, greetings, and small talk appropriate to different situations. • Students will engage effectively in extended conversations in formal and informal contexts, using cohesive devices and demonstrating good interactional competence and turn-taking skills. • Students will participate constructively in group discussions, express opinions logically and respectfully, and respond persuasively to others' viewpoints. • Students will perform effectively in interviews, applying suitable verbal and non-verbal communication techniques with confidence and professional self-presentation. • Students will communicate accurately and courteously over the telephone, demonstrating clarity, appropriate etiquette, and the ability to handle both formal and informal telephonic interaction.
			6	**VECD101:** Introduction to the Constitution of India	• Understand the philosophy, structure, and values of the Constitution of India. • Gain awareness about Fundamental Rights, Fundamental Duties, and Directive

					Principles of State Policy. • Understand the role and functioning of constitutional institutions such as Parliament, Executive, and the Judiciary. • Understand Citizenship, Democracy, and the Rule of Law. • Develop the capacity to critically analyze constitutional provisions and contemporary political issues.
			7	**IKSK101:** भारतीय ज्ञान परंपरा – कला आणि प्राचीन भारतीय भाषा	• To be Updated
				IKSK102: भारतीय ज्ञान परंपरा – सामाजिक शास्त्रे	• To be Updated
				IKSK103: भारतीय ज्ञान परंपरा – आरोग्य शास्त्र	• To be Updated
				IKSK104: भारतीय ज्ञान परंपरा – विज्ञान आणि तंत्रज्ञान	• To be Updated
				IKSK105: Indian Knowledge System – Generic	• To be Updated
			8	**CCRX101:** Health and Wellness-I	• To be Updated
				CCRX102: Yoga Education-I	• To be Updated
				CCRX103: Sports and Fitness-I	• To be Updated
				CCRX104: Cultural Activities-I	• To be Updated
				CCRX105: NSS-I	• To be Updated
				CCRX106: Fine/Applied/Visual/Performing Arts-I	• To be Updated
			OE Courses for other faculty		
			9	**MATE101:** Mathematics for Competitive Exam	• Demonstrate a solid understanding of fundamental mathematical concepts, including algebra, geometry, and arithmetic. • Apply shortcut techniques and strategies to solve problems quickly and accurately under exam conditions.

					• Manage time effectively during exams, balancing speed with accuracy in solving quantitative problems. • Face the quantitative sections of various competitive exams like SET, NET, GATE GRE, GMAT, CAT, UPSC, and others. • Enhance their analytical reasoning and data interpretation skills, enabling them to tackle a wide range of questions in competitive exams.
			10	**MATE102:** Logical Reasoning & Data Interpretation	• Logically evaluate problems and propose structured solutions using reasoning techniques. • Analyze, summarize, and present data using charts, tables, and graphs to derive insights. • Tackle a wide variety of logical puzzles and problems with clarity and precision. • Interpret numerical data and solve quantitative problems effectively. • Solve logical reasoning and data interpretation questions in competitive exams with confidence.
			Semester II		
			1	**MATC103:** Calculus	• Understand the algebraic, order, and completeness properties of real numbers. • Analyze and interpret the graphical behavior of functions. • Apply limit theorems and evaluate the continuity of functions. • Compute derivatives and apply them to solve real-world problems. • Utilize Mean Value Theorems and handle indeterminate forms using L'Hospital's rule. • Perform successive differentiation and solve problems involving tangents, normals, and arc length. • Solve optimization problems using maxima and minima concepts. • Approximate functions using Maclaurin's and Taylor's theorems for real-world applications
			2	**MATC104:** Practical Based on MATC103	• Write program for Limit, Derivative & Integration problems in Maxima • Solve mathematical problems manually as well as through Maxima programming • Apply mathematical concepts through interactive computations, visualizations • Develop theoretical, applied and computational skills • Gain confidence in solving problems

		3	**MATV102:** Programming in Python	• Write and execute basic Python programs, demonstrating proficiency in Python syntax and programming concepts. • Identify and use various data types and structures (e.g., strings, lists, dictionaries) in Python to store and manipulate data effectively. • Apply control structures (if-else statements, loops) to create dynamic and interactive programs. • Create simple visualizations using libraries like Matplotlib, enabling the effective communication of data insights.
		4	**SECS102:** MS-Excel with AI	• Effectively use basic Excel functions and features to perform data analysis and manipulation tasks. • Create various types of charts and visualizations in Excel and interpret them to extract meaningful insights • Use Excel's statistical tools to perform and interpret basic statistical analyses. • Leverage AI-powered features in Excel to gain insights and enhance their data analysis capabilities. • Use Power Query to import, clean, and transform data from various sources efficiently. • Create and use macros to automate repetitive tasks, improving efficiency in Excel.
		5	**AECL102:** Reading and Writing Skills in English	• Demonstrate an expanded vocabulary and apply appropriate word choices in reading and writing contexts, and comprehend, interpret, and analyse different types of texts with accuracy and critical understanding. • Employ suitable reading strategies to achieve specific objectives such as skimming, scanning, and intensive reading, and read efficiently with improved speed and retention, adjusting pace according to text difficulty, and interpret data and information effectively from tables, charts, diagrams, and graphs. • Construct grammatically correct and meaningful sentences using appropriate structures and transformations, and write coherent and well-organized paragraphs and essays with logical development of ideas. • Compose formal and informal letters using appropriate tone, format, and style, and prepare structured and concise reports for academic and professional purposes, and write effective and context-appropriate emails and social media messages using clarity and digital etiquette. Integrate reading and writing skills to express ideas logically, persuasively, and accurately across contexts.

		6	**VECD102:** Environmental Education	• Analyze historical, cultural, and industrial impacts on the environment, and explain the evolution of sustainability. • Distinguish between environmental issues at different spatial and temporal scales and evaluate pollution types and impacts. • Interpret pollution data and health standards, and assess pollution-related health risks. • Apply principles of environmental management and sustainability tools in real-world situations for decision-making and policy assessment.
		7	**CCRX107** Health and Wellness-II	• To be Updated
			CCRX108 Yoga Education-II	• To be Updated
			CCRX109 Sports and Fitness-II	• To be Updated
			CCRX110 Cultural Activities-II	• To be Updated
			CCRX111 NSS-II	• To be Updated
			CCRX112 Fine/Applied/ Visual/Performing Arts-II	• To be Updated
		Minor Courses for other discipline of same faculty or different faculty			
		8	**MATM101:** Foundation of Mathematics	• Demonstrate the ability to represent and manipulate sets and relations using Venn diagrams and algebraic methods. • Construct valid logical arguments and solve problems using propositional and predicate logic. • Apply the properties of number systems in algebraic and geometric contexts. • Combinatorics and Counting Principles: Solve real-world and theoretical problems using advanced counting techniques. • Solve equations and analyze functions within the domain of complex numbers. • Solve problems involving conformal mappings and compute derivatives of analytic functions. • Evaluate the convergence of sequences and infinite series with precision. • Accurately determine series convergence using appropriate mathematical tests.

		OE Courses for other faculty		
		9	**MATE103:** Mathematics for Quantitative Aptitude	• Demonstrate a solid understanding of fundamental mathematical concepts, including algebra, geometry, and arithmetic. • Apply shortcut techniques and strategies to solve problems quickly and accurately under exam conditions. • Manage time effectively during exams, balancing speed with accuracy in solving quantitative problems. • Face the quantitative sections of various competitive exams like SET, NET, GATE GRE, GMAT, CAT, UPSC, and others. • Enhance their analytical reasoning and data interpretation skills, enabling them to tackle a wide range of questions in competitive exams.
		10	**MATE104:** Statistics for Research	• Understand the fundamentals of statistics by defining key concepts, recognizing the importance and scope of statistics, and identifying its misuse • Apply appropriate sampling methods such as simple random, stratified, systematic, and convenience sampling for data collection. • Organize and present data effectively using tables, bar charts, pie charts, stem-and-leaf plots, histograms, and frequency distributions. • Compute and interpret measures of central tendency and dispersion, including mean, median, mode, variance, standard deviation, and coefficient of variation. • Analyse bivariate data and relationships between variables using scatter plots, correlation coefficients, and regression analysis. • Use R software for statistical analysis, including data manipulation, visualization, descriptive statistics, and simple linear regression modeling.
		Semester III		

		1	**MATC201:** Calculus of Several Variables	• Define and analyze the behavior of functions of two or more variables. • Solve problems involving partial derivatives, differentiability, and apply the chain rule and euler's theorem. • Identify and compute extreme values of multivariable functions using necessary conditions and lagrange multipliers. • Perform multiple integrations, applying techniques such as change of variables and integration in different coordinate systems.
		2	**MATC202:** Ancient Indian Mathematics	• Know the contributions of Indian mathematicians. • Analyse ancient Indian contributions to geometry and combinatorics • Understand the development of Algebra in India • Explore arithmetic including the concept of zero and number system. • Investigate early calculus techniques and astronomical concepts. • Understand the influence of ancient Indian mathematics on modern mathematics.
		3	**MATC203:** Coordinate Geometry	• Gain a thorough understanding of two-dimensional geometry, including principles of shapes, angles, and properties of various geometric figures. • Acquire comprehensive knowledge of three-dimensional geometry, focusing on the properties and applications of spheres, cones, and cylinders. • Demonstrate the ability to interpret and analyze three-dimensional shapes in real-world scenarios. • Apply acquired geometric knowledge to solve practical problems and make informed decisions in relevant fields
		4	**MATV201:** R Programming	• Demonstrate proficiency in key mathematical concepts, including calculus and linear algebra, and apply them using R. • Perform various statistical analyses (e.g., hypothesis testing, regression analysis) using R, and interpret the results accurately. • Import, clean, and preprocess datasets, ensuring they are ready for mathematical and statistical analysis. • Create informative visualizations to illustrate mathematical functions, statistical distributions, and analysis results using R. • Apply theoretical mathematical and statistical concepts to practical scenarios, demonstrating the ability to solve complex problems. • Analyze and critique the results of mathematical and statistical analyses, making informed decisions based on data evidence.
		5	**AECL201:** श्रवण	• To be Updated

				आणि संभाषण कौशल्ये	
			6	MATF204: Field Project	• Utilize concepts, theories, and methodologies learned in the classroom to analyze real-world situations. • Demonstrate problem-solving skills by addressing field-specific challenges. • Design and implement effective research methodologies, including surveys, interviews, and field observations. • Collect, analyze, and interpret qualitative and quantitative data from fieldwork.
			7	**CCRX201:** Health and Wellness-III	• To be Updated
				CCRX202: Yoga Education-III	• To be Updated
				CCRX203: Sports and Fitness-III	• To be Updated
				CCRX204: Cultural Activities-III	• To be Updated
				CCRX205: NSS-III	• To be Updated
				CCRX206: Fine/Applied/Visual/Performing Arts-III	• To be Updated
			Minor Courses for other discipline of same faculty or different faculty		
			8	**MATM201:** Fundamentals of Calculus	• Identify and graphically represent various functions, understanding their properties and transformations. • Solve problems involving limits and verify the continuity of functions in given intervals. • Apply differentiation techniques to compute rates of change and solve optimization problems. • Use mean value theorems to analyze function behaviour and prove related mathematical results. • Compute partial derivatives and interpret their physical significance in multivariable contexts. • Perform vector operations and understand concepts like gradient, divergence, and curl. • Solve integration problems and evaluate definite and indefinite integrals using standard techniques. • Use integrals to calculate physical quantities like area, volume, and solve differential

				equations.
		9	**MATM202:** Practical Based on MATM201	• Identify and interpret different types of functions and analyze their behaviors using graphs. • Evaluate limits and determine the continuity of functions with precision. • Differentiation: Solve real-world problems involving rates of change, tangents, and optimization using differentiation. • Apply Rolle's and Lagrange's theorems to analyze function behavior and prove related results. • Calculate partial derivatives and understand their applications in optimization and modeling. • Perform vector operations and analyze physical phenomena using gradient, divergence, and curl. • Compute definite and indefinite integrals effectively and understand their mathematical significance.
		OE Courses for other faculty		
		10	**MATE201:** Mathematics for Finance	• Explain and apply core financial mathematics concepts, such as compound interest, annuities, and Budget Basics. • Perform accurate financial calculations related to interest rates, present and future values, and cash flows. • Formulate and solve practical financial problems using mathematical techniques, including valuation of investments and loans. • Use the time value of money concept in various financial decisions such as investment analysis, loan amortization, and retirement planning. • Tackle more advanced financial mathematics topics and use them in real-life financial and investment contexts.
		Semester IV		
		1	**MATC205:** Linear Algebra	• Define and identify groups, subgroups, vector spaces, and subspaces, and understand their fundamental properties. • Explain linear dependence, identify bases, and calculate the dimension of vector spaces, as well as describe the sum and direct sum of subspaces. • Analyze and classify linear transformations

					based on their invertibility and isomorphisms, and determine whether transformations are singular or non-singular. • Find eigenvalues and eigenvectors of linear transformations, apply the cayley-hamilton theorem, and diagonalize matrices.
			2	**MATC206:** Complex Variables	• Define complex numbers, identify complex functions, and list elementary complex functions such as exponential, logarithmic, and trigonometric functions. • Explain the concept of an analytic function and demonstrate how the Cauchy-Riemann equations are used to verify analyticity • Compute complex integrals along contours and use Taylor and Laurent series to represent complex functions in neighborhoods of singularities. • Apply the residue theorem to compute real integrals and analyze singularities of complex functions. • Apply conformal mappings to transform complex functions and solve real-world applications, such as fluid flow and electrostatics.
			3	**MATC207:** Practical Based on MATC205 & MATC206	• Solve systems of linear equations and work with matrices. • Use contour integration and residue theorem to solve complex integrals. • Apply theoretical concepts to interdisciplinary problems in science and engineering.
			4	**SECS201:** Intellectual Property Rights	• Understand the Concept of IPR and different Kinds of IPR. • Know the procedure for application of various IPs. • Understand infringement and remedies available. • Know various issues relating to protection of IPR in Digital Age.
			5	**AECL202:** वाचन आणि लेखन कौशल्ये	• To be Updated
			6	**MATG208:** Awareness of Sustainable Development Goals-I	• Understand the Concept of Sustainable Development • Explain the 17 Sustainable Development Goals (SDGs) • Analyze Environmental, Social, and Economic Sustainability • Examine India's Role in Achieving SDGs • Promote Sustainable Lifestyles and Ethical Responsibility • Apply Knowledge to Community Engagement and Problem-Solving • Develop a Global Perspective on Sustainability
			7	**CCRX207:** Health and Wellness-IV	• To be Updated

			CCRX208: Yoga Education-IV	• To be Updated
			CCRX209: Sports and Fitness-IV	• To be Updated
			CCRX210: Cultural Activities-IV	• To be Updated
			CCRX211: NSS-IV	• To be Updated
			CCRX212: Fine/Applied/Visual/Performing Arts-IV	• To be Updated
		Minor Courses for other discipline of same faculty or different faculty		
		8	**MATM203:** Applied Linear Algebra	• Perform operations on matrices and use them to solve real-world and theoretical problems. • Determine the rank of matrices and apply it to assess linear independence and solve linear equations. • Solve systems of equations efficiently and understand their solution sets using matrix techniques. • Compute eigenvalues and eigenvectors and apply them to problems involving diagonalization and stability analysis. • Demonstrate understanding of group theory concepts and solve problems involving symmetry and structure. • Identify and analyze vector spaces and subspaces in mathematical and applied contexts.
		9	**MATM204:** Practical Based on MATM203	• Demonstrate proficiency in matrix operations and apply them to solve scientific problems. • Determine the rank of matrices and use it to assess linear dependence and solve practical problems. • Solve practical systems of linear equations using matrix methods and interpret the solutions. • Analyze real-world systems like vibration modes and networks using eigenvalues and eigenvectors. • Apply group theory concepts to solve problems in cryptography, coding theory, and symmetry analysis. • Solve problems involving the classification and structure of vector spaces in applied mathematics.
		OE Courses for other faculty		

		10	**MATE202:** Basics of Actuarial Science	• Acquire fundamental knowledge of actuarial principles and practices. • Develop basic problem-solving skills in risk assessment, finance, and insurance. • Understand different types of insurance and pensions, and how actuaries contribute to these industries. • Gain awareness of the ethical and regulatory framework guiding actuarial work. • Build a foundational understanding of financial mathematics used in assessing risk and designing insurance products.
		Semester V			
		1	**MATC301:** Differential Equations	• Define and describe various types of differential equations and their solution methods, including understanding the significance of the Wronskian and dependency of solutions. • Solve first-order, higher-order, and linear differential equations with constant coefficients, applying techniques such as integrating factors and exact equations. • Evaluate the dependency of solutions using the Wronskian and apply Charpit's method to solve first-order PDEs, including special cases. • Model and solve real-world applications of differential equations.
		2	**MATC302:** Real Analysis	• Define sequence in terms of functions from N to a subset of R • Recognize bounded, convergent, divergent, Cauchy and monotonic sequences • Calculate limit superior, limit inferior, and the limit of a bounded sequence • Use the ratio, root, alternating series and limit comparison tests for convergence and absolute convergence of an infinite series of real numbers
		3	**MATC303:** Programming in MATLAB	• Write MATLAB scripts and functions to perform basic computations. • Utilize MATLAB to analyze data, visualize results, and solve practical problems. • Apply MATLAB to perform matrix operations, plot data, and simulate basic systems. • Understand basic programming concepts such as loops, conditionals, and data structures in MATLAB. • Develop simple applications in engineering or science using MATLAB tools.
		4	**MATC304:**	• Develop a strong grasp of basic graph theory concepts, including definitions, types of

				Graph Theory	graphs, and graph isomorphism. • Identify and distinguish between different kinds of graphs such as trees, Eulerian, and Hamiltonian graphs, as well as understand subgraphs and spanning trees. • Apply skills to analyze and solve various graph-related problems.
			5	**MATC305:** Dynamical Systems	• Understand the basic definitions and classifications of dynamical systems. • Analyze the behaviour of dynamical systems over time, both in discrete and continuous settings. • Apply linearization techniques to study the stability of equilibrium points. • Explore bifurcation theory and its implications for system behaviour.
			6	**MATC306:** Analytical Geometry	• Recognize, classify, and describe geometric shapes such as lines, circles, ellipses, parabolas, and hyperbolas in both two and three dimensions. • Understand different coordinate systems (e.g., Cartesian, polar, cylindrical, and spherical coordinates) and their applications in representing geometric objects. • Acquire proficiency in applying transformation techniques such as translation, rotation, scaling, and reflection to geometric objects. • Understand parametric equations and how they represent curves and surfaces, as well as their applications in motion and trajectory analysis
			7	**MATV301:** LaTeX	• Create and structure basic documents using LaTeX. • Format text, pages, and sections to meet academic and professional standards. • Incorporate and format mathematical equations, tables, and figures. • Effectively cite references using LaTeX's bibliography management tools. • Design and compile reports, papers, and presentations using LaTeX's advanced features. • Automate repetitive tasks like formatting references, generating table of contents, and cross-referencing figures.
			8	**MATF307:** Field Project	• Apply Theoretical Knowledge to Real-World Situations • Develop Research and Data Collection Skills • Enhance Problem-Solving and Critical Thinking Abilities • Improve Communication and Report Writing Skills • Demonstrate Teamwork and Leadership in Field Settings • Understand Ethical, Social, and

					Environmental Aspects of Fieldwork • Apply Learning to Professional and Career Development
		9	**MATG308:** Awareness of Sustainable Development Goals-II		• Understand the Concept of Sustainable Development • Explain the 17 Sustainable Development Goals (SDGs) • Analyze Environmental, Social, and Economic Sustainability • Examine India's Role in Achieving SDGs • Promote Sustainable Lifestyles and Ethical Responsibility • Apply Knowledge to Community Engagement and Problem-Solving • Develop a Global Perspective on Sustainability
		Minor Courses for other discipline of same faculty or different faculty			
		10	**MATM301:** Introductory Differential Equations		• Define and classify different types of differential equations and understand their basic properties. • Solve first-order and first-degree differential equations using various methods (e.g., separation of variables, integrating factors). • Solve linear differential equations with constant coefficients and understand their solutions' behaviour. • Demonstrate proficiency in solving non-homogeneous linear differential equations using appropriate techniques. • Apply differential equations to model and solve practical problems in areas such as physics and engineering.
		11	**MATM302:** Practical Based on MATM301		• Demonstrate the ability to identify and classify differential equations based on their type and order. • Solve simple first-order equations and interpret their solutions in practical contexts. • Handle more complex scenarios requiring advanced solution techniques for first-order equations. • Solve first-order equations of higher degrees and understand their geometric and physical interpretations. • Solve higher-order linear differential equations and analyze their solution behaviors. • Apply various methods to solve non-homogeneous differential equations and evaluate their solutions in applied scenarios. • Use differential equations to model and solve real-world problems, including motion, population dynamics, and heat conduction

			Semester VI		
		1	**MATC309:** Metric Spaces	• Demonstrate a solid understanding of the fundamental concepts and properties of metric spaces, including metric definitions, metric properties, and examples of metric spaces. • Develop skills in analysing sequences and series in metric spaces, including identifying convergence, Cauchy sequences, and completeness criteria. • Understand the notions of continuity and uniform continuity in metric spaces, and their implications for functions defined on metric spaces.
		2	**MATC310:** Group Theory	• Recognize the mathematical objects that are groups, and classify them as abelian, cyclic, permutation groups • Analyze consequences of Lagrange's theorem • Explain the significance of the notion of cosets, normal subgroups, and factor groups
		3	**MATC311:** Mathematical Modelling	• Demonstrate a solid understanding of the principles and techniques of mathematical modeling, including the formulation, analysis, and interpretation of mathematical models in various contexts. • Apply a range of mathematical tools and techniques, including differential equations, optimization methods, probability and statistics, and computational algorithms, to solve real-world problems through modeling. • Exhibit critical thinking skills and creativity in approaching complex problems, including the ability to identify key variables, make appropriate simplifications and assumptions, and devise effective modeling strategies.
		4	**MATC312:** LPP and Game Theory	• Formulate linear programming problems and solve those using graphical and simplex methods. • Understand and apply the concept of duality in LPP. • Use transportation and assignment models to solve optimization problems. • Analyze and solve two-person zero-sum games using game theory concepts. • Apply different methods of optimization to find solutions to real-world problems. • Develop strategies for decision-making in competitive situations using game theory.
		5	**MATC313:** Lattice Theory & Boolean Algebra	• Understand the structure of lattices and the relationship between lattice theory and partial orders. • Apply principles of Boolean algebra in simplifying logic expressions and solving related problems.

					• Analyze and solve problems involving distributive and modular lattices, complemented lattices, and sublattices. • Use Boolean algebra in practical applications like digital logic design, switching circuits, and computer algorithms.
			6	**MATC314:** Numerical Analysis	• Implement basic numerical algorithms for equations, interpolation, and integration. • Evaluate and compare the performance of different numerical methods. • Apply numerical methods to solve ordinary and partial differential equations. • Interpret and analyze results from numerical simulations and real-world applications.
			7	**MATC315:** On Job Training	• Apply Theoretical Knowledge in a Professional Setting • Develop Practical and Technical Skills • Enhance Communication and Interpersonal Skills • Understand Workplace Ethics and Professionalism • Develop Problem-Solving and Critical Thinking Abilities • Improve Time Management and Organizational Skills • Gain Industry Exposure and Career Readiness • Understand industry trends, career opportunities, and professional growth pathways. • Prepare for Future Employment or Entrepreneurship
			Minor Courses for other discipline of same faculty or different faculty		
			8	**MATM303:** Numerical Methods	• Numerically solve algebraic and transcendental equations using appropriate methods (e.g., Newton's method). • Solve systems of simultaneous equations using direct and iterative numerical techniques. • Apply finite difference methods to approximate functions and construct interpolation models. • Use numerical differentiation and integration techniques to approximate derivatives and integrals for given functions. • Demonstrate the ability to solve difference equations and apply numerical methods to ordinary differential equations.
			9	**MATM304:** Practical Based on MATM303	• Solve practical problems involving roots of equations using methods like bisection, secant, and Newton-Raphson. • Demonstrate proficiency in solving systems of linear equations numerically with efficiency and accuracy. • Apply finite difference techniques in

					discrete approximations for engineering and scientific problems. • Use interpolation methods to estimate intermediate values in tabular data for modeling and prediction. • Approximate derivatives and apply them in engineering and physics problems where analytical differentiation is challenging. •
				Semester VII	
			1	**MATC401:** Real Analysis	• Comprehend the aspect of Metric Space which forms foundation for topology • Understand thorough foundation of Riemann integration theory • Use convergence of sequence and series of functions to evaluate Riemann integration of functions
			2	**MATC402**: Abstract Algebra	• Build foundation of group and ring theory • Apply the concept of subgroup and normal subgroups to discuss the solvability of groups and thereby solvability of equations of any positive order • Generalize the concepts of divisibility to rings and apply them in general context and factorize polynomials.
			3	**MATC403:** Ordinary Differential Equations	• Understand various methods of solutions of differential equations of first and second order. • Apply these methods to solve differential equations in physics and engineering fields • Discuss approximation and existence & uniqueness of solution of nth order differential equations to solve them using the techniques discussed thereby.
			4	**MATC404:** Programming in C and Scilab	• Use numerical methods in solving problems in Maths, Physics, Chemistry and any other areas using C. • Perform various Matrix Operations using C. • Write, compile and debug programs in Scilab. • Understand and solve matrices operations effectively using Scilab • Use conditional expressions and looping statement to solve problems associated with conditions and repetitions • Solve problems by using various numerical methods in Scilab

		5	**RESR405:** Research Methodology	• Understand some basic concepts of research and its methodologies. • Select proper method of Data collection & representation • Select and apply appropriate statistical method for data analysis. • Perform literature review, research writings with the knowledge of Intellectual Property Rights.
		6	**MATC406**: Operations Research	• Understand the theory of convex sets, functions, formulation of LPP, techniques of integer and non-integer solution of Linear and nonlinear programming problems. • Use quantitative methods and techniques for effective decisions– making • Develop model formulation and applications that are used in solving business decision problems.
		7	**MATC407**: Numerical Analysis	• Find solutions of algebraic or transcendental equations using an appropriate numerical method • Solve linear systems of equations using an appropriate numerical method • Apply the techniques of numerical methods to solve ordinary differential equations.
		Semester VIII			
		1	**MATC409:** Topology	• Understand the basic concepts of topology and base for the topology • Discuss continuity of functions in topological spaces • Apply countability axioms for discussion of compactness, connectedness and sequential continuity of functions.
		2	**MATC410**: Linear Algebra	• Develop concepts of vector spaces and modules • Solve problems based on Linear transformations and Characteristic roots • Construct matrices in Nilpotent, Jordan and Rational forms which are useful for solving system of equations • Visualize theadjoint, self-adjoint and normal linear trans formations
		3	**MATC411**: Partial Differential Equations	• Solve the first-order linear and non-linear partial differential equations by using Lagrange's and Charpit'smethods respectively. • Understand concepts, methods of Solutions

					and applications of Partial Differential equations.
		4	**MATC412**:LaTex and Programming in SageMath	• Write a simple LaTeX input document based on the article class • Turn the input document into pdf with the pdflatex program • Format Words, Lines, and Paragraphs • Understand how to present data using tables • Typeset mathematical formulas, use nested list, tabular and array environments. • Import figures and pictures that are stored in external files.
		5	**MATO413**: OJT	• Students will demonstrate proficiency in applying theoretical knowledge and academic concepts to real-world professional situations. • Students will possess job-specific skills that are relevant to their chosen field of study, enabling them to perform tasks and responsibilities effectively and efficiently. • Students will acquire a comprehensive understanding of industry practices, trends, and challenges, contributing to their overall knowledge and expertise in the field.
		6	**MATC415**: Number Theory	• Understand the concept of arithmetical functions • Solve problems based on congruences and quadratic residues • Know the concepts of primitive root theory
		7	**MATC416**: Field Theory	• Understand concepts in field theory such as finite and algebraic extensions, algebraic elements, constructible elements, solvable groups etc • Aware the motive behind development of galois theory and solvability by radicals • Apply concepts in field theory for solving polynomial equations, systems of equations, ancient problems on impossibility of constructions and finding formula for solutions of polynomial equations.

Appendix III

Evaluation Pattern

[CA and EE Evaluation Pattern as per the Minutes of the Meeting of the NEP Cell Dated 21.11.2023]

SN	Type of Course	Continuous Assessment (CA)	End Examination (EE)
1.	Theory (T) **4 Credit** 100 Marks CA: 30% EE: 70%	Each student is required to attempt total 02 (Two) "Continuous Assessments (CAs)" for each course of each Semester, as per the following details: 1. CA01: 'Continuous Assessment 01 (CA01)' on Credit 01 to Credit 04 of each course, consists of • 2 (Two) 'Short Answer Questions (SAQs)', each carrying 05 Marks, on Credit 01 and Credit 02 **and** • 1 (One) 'Long Answer Question (LAQ)' of 10 Marks, on Credit 03 and Credit 04. LAQ may consist of sub-questions. **CA01**: On Credit 01 to Credit 04, of Marks = (5x2 + 10) = **20 Marks** 2. CA02: 'Continuous Assessment 02 (CA02)' on Credit 01 to Credit 04 of each course, consists of • A test containing total **10** (Ten) 'Objective Type Questions, ' 05 (Five) on Credit 01 and Credit 02, and 05 (Five) on Credit 03 and Credit 04. Each 'Objective Type Question' of 1 Mark. **CA02**: On Credit 01 to Credit 04, of Marks = **10 Marks** 3. Maximum number of attempts for **CA,** during each semester: Single attempt only 4. **Total Marks**: **30** Marks	1. Student is required to answer **05 'VSAQs' out of 06 'VSAQs'**, each carrying 03 Marks, on Credit 01 to 04, for total 15 Marks. One VSAQ will be on each Credit. 2. Student is required to answer **05 'SAQs' out of 06 'SAQs'**, each carrying 05 Marks, on Credit 01 to 04, for total 25 Marks. One SAQ will be on each Credit. 3. Student is required to answer **01 'LAQ' out of 2 LAQs,** of 10 Marks on Credit 01 and Credit 02, for total 10 Marks. LAQ may consist of sub-questions. 4. Student is required to answer **01 'LAQ' out of 2 LAQs,** of 10 Marks on Credit 03 and Credit 04, for total 10 Marks. LAQ may consist of sub-questions. 5. Student is required to answer **01 'LAQ' out of 2 LAQs,** of 10 Marks on Credit 01 to Credit 04, for total 10 Marks. LAQ may consist of sub-questions. 6. Number of attempts: Till Valid Registration Period (VRP) only 7. Marks: 70 Marks 8. Duration: 150 minutes

<table>
<tr><th>SN</th><th>Type of Course</th><th colspan="2">Continuous Assessment (CA)</th><th>End Examination (EE)</th></tr>
<tr><td></td><td></td><td colspan="2"><table>
<tr><th>SN</th><th>Description</th><th>Evaluation of End Examination (EE)</th><th>Marks</th></tr>
<tr><td rowspan="3">1</td><td rowspan="3">Question Types</td><td>Very Short Answer Question (VSAQ) on each Credit</td><td>03 Marks</td></tr>
<tr><td>Short Answer Question (SAQ) on each Credit</td><td>05 Marks</td></tr>
<tr><td>On each Credit, either Single Long Answer Question (LAQ) or LAQ contains sub-questions (a), (b) and so on.</td><td>10 Marks</td></tr>
<tr><td>2</td><td>Grand Total Marks</td><td>Total five Questions in EE Question paper based on:
Credit 01 to 04 : 05 VSAQs out of 06 VSAQs (15 Marks)
Credit 01 to 04 : 05 SAQs out of 06 SAQs (25 Marks)
Credit 01 to 02 : 01 LAQ out of 02 LAQs (10 Marks)
Credit 03 to 04 : 01 LAQ out of 02 LAQs (10 Marks)
Credit 01 to 04 : 01 LAQ out of 02 LAQs (10 Marks)
LAQ may contains sub-questions</td><td>70 Marks</td></tr>
</table></td><td></td></tr>
<tr><td>2.</td><td>Theory (T)

2 Credit
50 Marks

CA: 30%
EE: 70%</td><td colspan="2">Each student is required to attempt total 01 (One) “Continuous Assessment (CA)” for each course of each Semester, as per the following details:
1. CA01: 1 (One) ‘Continuous Assessment 01 (CA01)’ on Credit 01 and Credit 02 of each course, consists of
• 1 (One) ‘Short Answer Question (SAQ)’ of 5 Marks
and
• 1 (One) ‘Long Answer Question (LAQ)’of 10 Marks, LAQ may consist of sub-questions.
CA01: On Credit 01 and Credit 02, of Marks = (5 + 10) = 15 Marks
2. Maximum number of attempts for CA, during each semester: Single attempt only
3. Total Marks: 15 Marks</td><td>1. Student is required to answer 05 ‘VSAQs’ out of 06 ‘VSAQs’, each carrying 03 Marks, on Credit 01 to 02, for total 15 Marks. One VSAQ will be on each Credit.
2. Student is required to answer 02 ‘SAQs’ out of 03 ‘SAQs’, each carrying 05 Marks, on Credit 01 to 02, for total 10 Marks. One SAQ will be on each Credit.
3. Student is required to answer 01 ‘LAQ’ out of 2 LAQs, of 10 Marks on Credit 01 and Credit 02, for total 10 Marks. LAQ may consist of sub-questions.
4. Number of attempts: Till Valid Registration Period (VRP) only
5. Marks: 35 Marks
6. Duration: 75 minutes</td></tr>
</table>

<table>
<tr><th>SN</th><th>Type of Course</th><th colspan="3">Continuous Assessment (CA)</th><th colspan="3">End Examination (EE)</th></tr>
<tr><td></td><td></td><td></td><td colspan="5"><table>
<tr><td>SN</td><td>Description</td><td>Evaluation of End Examination (EE)</td><td>Marks</td></tr>
<tr><td rowspan="3">1</td><td rowspan="3">Question Types</td><td>Very Short Answer Question (VSAQ) on each Credit</td><td>03 Marks</td></tr>
<tr><td>Short Answer Question (SAQ) on each Credit</td><td>05 Marks</td></tr>
<tr><td>On each Credit, either Single Long Answer Question (LAQ) or LAQ contains sub-questions (a), (b) and so on.</td><td>10 Marks</td></tr>
<tr><td>2</td><td>Grand Total Marks</td><td>Total three Questions in EE Question paper based on:
Credit 01 to 02: 05 VSAQs out of 06 VSAQs (15 Marks)
Credit 01 to 02: 02 SAQs out of 03 SAQs (10 Marks)
Credit 01 to 02: 01 LAQ out of 02 LAQs (10 Marks)
LAQ may contains sub-questions</td><td>35 Marks</td></tr>
</table></td></tr>
</table>

<table>
<tr><th>SN</th><th>Type of Course</th><th colspan="2">Continuous Assessment (CA)</th><th>End Examination (EE)</th></tr>
<tr><td>3.</td><td>Practical (P)

4 Credit
100 Marks

CA: 50%
EE: 50%</td><td colspan="2">1. Student is required to submit “Activity Report in Work-Book Format” for each Credit in the prescribed format.
2. Maximum number of attempts for each CA, during each semester: Single attempt only
3. Marks: 50 Marks
4. Grading criteria:
<table>
<tr><td>Lab Punctuality, Preparedness & Ethics</td><td>Irregular in lab. Copies the experiment from others
(0 Points)</td><td>Consistently regular but unable to explain the concepts
(06 Points)</td><td>Punctuality in lab. Follows the procedure and responds to questions asked
(10 Points)</td></tr>
<tr><td>Activity Report and Performance

(Experiment No, Date, Objectives, Apparatus with specification, Observations, Graphs, software used if any)</td><td>Poor Documentation and copied the experiment from others.
Couldn't perform the Activity /poor observation made
(04 Points)</td><td>Average Documentation: Report is in format but some of the formatting guidelines are missed.
Performed the Activity but observations made with some mistakes
(12 Points)</td><td>Good Documentation: Lab activity writing is in proper format with all references, Grammar.
Performed the Activity on time observations made with no mistakes
(20 Points)</td></tr>
<tr><td>Results and Conclusion</td><td>Unable to achieve the desired results but makes attempts to relate data to theory.
Poor concluding statements
(08 Points)</td><td>Average graphical and tabulated representation with misinterpret physical significance of theory.
Achieve the desired results and but insufficient conclusion statement.
(14 Points)</td><td>Analyses and interpret observed data carefully with good graphical and tabulated representation using appropriate theory/evidence.
Achieve the results and reach to appropriate Conclusion
(20 Points)</td></tr>
</table></td><td>External and internal examiners shall assess each student based on:
1. Workbook/Activity Report submission by the student (Only by External Examiner) [05 Marks]
2. Practical Activity performed by the student [12 Marks]
3. Result and Conclusion of the Practical Activity [13 Marks]
4. Viva-Voce on Practical Activities [20 Marks]
5. Number of attempts: Till Valid Registration Period (VRP) only
6. Marks: 50 Marks
7. Duration: 180 minutes</td></tr>
</table>

SN	Type of Course	Continuous Assessment (CA)	End Examination (EE)

SN	Evaluation of Practical End Examination		
	Description	Internal Examiner	External Examiner
1	Workbook/Activity Report	-	05 Marks
2	Actual Conduct of one randomly selected Practical Activity	02 Marks	10 Marks
3	Diagram, Synoptic Answers, Graph/Observation and Conclusion	03 Marks	10 Marks
4	Viva-Voce/Oral	05 Marks	15 Marks
5	Total	10 Marks	40 Marks

<table>
<tr><th>SN</th><th>Type of Course</th><th>Continuous Assessment (CA)</th><th>End Examination (EE)</th></tr>
<tr><td>4.</td><td>Practical (P)

2 Credit
50 Marks

CA: 50%
EE: 50%</td><td>1. Student is required to submit “Activity Report in Work-Book Format” for each Credit in the prescribed format.
2. Maximum number of attempts for each CA, during each semester: Single attempt only
3. Marks: 25 Marks
4. Grading criteria:
<table>
<tr><td>Lab Punctuality, Preparedness & Ethics</td><td>Irregular in lab. Copies the experiment from others
(0 Points)</td><td>Consistently regular but unable to explain the concepts
(03 Points)</td><td>Punctuality in lab. Follows the procedure and responds to questions asked
(05 Points)</td></tr>
<tr><td>Activity Report and Performance

(Experiment No, Date, Objectives, Apparatus with specification, Observations, Graphs, software used if any)</td><td>Poor Documentation and copied the experiment from others.
Couldn’t perform the Activity /poor observation made
(02 Points)</td><td>Average Documentation: Report is in format but some of the formatting guidelines are missed. Performed the Activity but observations made with some mistakes
(06 Points)</td><td>Good Documentation: Lab activity writing is in proper format with all references, Grammar.
Performed the Activity on time observations made with no mistakes
(10 Points)</td></tr>
<tr><td>Results and Conclusion</td><td>Unable to achieve the desired results but makes attempts to relate data to theory. Poor concluding statements
(04 Points)</td><td>Average graphical and tabulated representation with misinterpret physical significance of theory. Achieve the desired results and but insufficient conclusion statement.
(07 Points)</td><td>Analyses and interpret observed data carefully with good graphical and tabulated representation using appropriate theory/evidence. Achieve the results and reach to appropriate Conclusion
(10 Points)</td></tr>
</table></td><td>1. External and internal examiners shall assess each student based on:
a. Workbook/Activity Report submission by the student (Only by External Examiner) [05 Marks]
b. Practical Activity performed by the student [06 Marks]
c. Result and Conclusion of the Practical Activity[07 Marks]
d. Viva-Voce on Practical Activities [07 Marks]
2. Number of attempts: Till Valid Registration Period (VRP) only
3. Marks: 25 Marks
4. Duration: 180 minute</td></tr>
</table>

<table>
<tr><th>SN</th><th>Type of Course</th><th colspan="2">Continuous Assessment (CA)</th><th>End Examination (EE)</th></tr>
<tr><td></td><td></td><td colspan="2">
<table>
<tr><td rowspan="2">SN</td><td colspan="3">Evaluation of Practical End Examination</td></tr>
<tr><td>Description</td><td>Internal Examiner</td><td>External Examiner</td></tr>
<tr><td>1</td><td>Workbook/Activity Report</td><td>-</td><td>05 Marks</td></tr>
<tr><td>2</td><td>Actual Conduct of one randomly selected Practical Activity</td><td>01 Marks</td><td>05 Marks</td></tr>
<tr><td>3</td><td>Diagram, Synoptic Answers, Graph/Observation and Conclusion</td><td>02 Marks</td><td>05 Marks</td></tr>
<tr><td>4</td><td>Viva-Voce/Oral</td><td>02 Marks</td><td>05 Marks</td></tr>
<tr><td></td><td>Total</td><td>05 Marks</td><td>20 Marks</td></tr>
</table>
</td><td></td></tr>
<tr><td>5.</td><td>Term Work (TW)

2 Credit
50 Marks

CA: 50%
EE: 50%

For SEC & VSC courses</td><td colspan="2">1. Student is required to submit “Activity Report in Work-Book Format” for each Credit in the prescribed format.
2. Maximum number of attempts for each CA, during each semester : Single attempt only
3. Marks: 25 Marks
4. Grading Criteria:
<table>
<tr><td>Lab Punctuality, Preparedness & Ethics</td><td>Irregular in lab. Copies the experiment from others
(0 Points)</td><td>Consistently regular but unable to explain the concepts
(03 Points)</td><td>Punctuality in lab. Follows the procedure and responds to questions asked
(05 Points)</td></tr>
<tr><td>Activity Report and Performance

(Experiment No, Date, Objectives, Apparatus with specification, Observations, Graphs, software used if any)</td><td>Poor Documentation and copied the experiment from others. Couldn't perform the Activity /poor observation made
(02 Points)</td><td>Average Documentation: Report is in format but some of the formatting guidelines are missed. Performed the Activity but observations made with some mistakes
(06 Points)</td><td>Good Documentation: Lab activity writing is in proper format with all references, Grammar. Performed the Activity on time observations made with no mistakes
(10 Points)</td></tr>
<tr><td>Results and Conclusion</td><td>Unable to achieve the desired results but makes attempts to relate data to theory. Poor concluding statements
(04 Points)</td><td>Average graphical and tabulated representation with misinterpret physical significance of theory. Achieve the desired results and but insufficient conclusion statement.
(07 Points)</td><td>Analyses and interpret observed data carefully with good graphical and tabulated representation using appropriate theory/evidence. Achieve the results and reach to appropriate Conclusion
(10 Points)</td></tr>
</table>
</td><td>1. External and internal examiners shall assess each student based on:
a. Workbook/Activity Report submission by the student (Only by External Examiner) [05 Marks]
b. Viva-Voce on Practical Activities [20 Marks]
2. Number of attempts: Till Valid Registration Period (VRP) only
3. Marks: 25 Marks
4. Duration: 180 minutes</td></tr>
</table>

<table>
<tr><th>SN</th><th>Type of Course</th><th>Continuous Assessment (CA)</th><th>End Examination (EE)</th></tr>
<tr><td></td><td></td><td>
<table>
<tr><td rowspan="2">SN</td><td colspan="3">Evaluation of Practical End Examination</td></tr>
<tr><td>Description</td><td>Internal Examiner</td><td>External Examiner</td></tr>
<tr><td>1</td><td>Workbook/Activity Report</td><td>-</td><td>05 Marks</td></tr>
<tr><td>2</td><td>Viva-Voce/Oral</td><td>05 Marks</td><td>15 Marks</td></tr>
<tr><td></td><td>Total</td><td>05 Marks</td><td>20 Marks</td></tr>
</table>
</td><td></td></tr>
<tr><td>6.</td><td>Field Project (TW)

2 Credit
50 Marks

CA: 100%</td><td>Students need to complete Field Project (Total Study hours 60 hrs including Activity Report) related to selected Major. After completion of the field project, learners shall submit a report to the LSC – Programme Coordinator (PC) and Mentor/Guide.
1. Maximum number of attempts for each CA, during each semester: Single attempt only
2. Duration: Minimum 15 days or 2 Weeks duration – Any month during the semester 3 & semester 5 of UG programme
3. Marks: 50 Marks
4. Grading Criteria for Evaluation of FP (only by Internal Examiner - Programme Coordinator (PC)/ Supervisor of LSC):
<table>
<tr><td>SN</td><td>Description</td><td>Marks</td></tr>
<tr><td>1</td><td>Key Definitions of Problem area and analysis of preliminary data</td><td>10</td></tr>
<tr><td>2</td><td>Work related to formats, Correspondence, Interactions and liaising etc</td><td>05</td></tr>
<tr><td>3</td><td>Field work and data collection, Analysis</td><td>10</td></tr>
<tr><td>4</td><td>Feedback to community</td><td>05</td></tr>
<tr><td>5</td><td>Report submission</td><td>10</td></tr>
<tr><td>6</td><td>Viva-Voce /Oral</td><td>10</td></tr>
<tr><td colspan="2">Total</td><td>50</td></tr>
</table>
</td><td>End Examination is Not Applicable (NA)</td></tr>
</table>

<table>
<tr><th>SN</th><th>Type of Course</th><th>Continuous Assessment (CA)</th><th>End Examination (EE)</th></tr>
<tr><td>7.</td><td>OJT or Internship (TW)

4 Credit
100 Marks

CA: 50%
EE: 50%</td><td>
1. Students need to complete one month On Job Training (OJT) or Internship related to selected Major (Total Study hours 120 hrs including Internship Report) in any Industry / Organization / Institute/ R&D Division/ Any Micro/ Small/ Medium/ enterprise/ Govt/NGO/PSU/Online Internship related to Major course.
2. Maximum number of attempts for each CA, during each semester: Single attempt only
3. Marks: 50 Marks
4. Duration: 1 Month or 4 Weeks duration – Any one month within semester duration, but before end examination of that particular semester
5. Grading Criteria for Evaluation of OJT (or Intern) only by Mentor where the Internship is proposed to be imparted:
<table>
<tr><th>SN</th><th>Parameters</th><th>Marks Out of</th></tr>
<tr><td>1</td><td>Behaviors, Shows interest in assigned work, Willingness to learn</td><td>10</td></tr>
<tr><td>2</td><td>Accepts responsibility, Cooperates with co-workers and supervisors, Demonstrates organizational skills</td><td>10</td></tr>
<tr><td>3</td><td>Uses time, knowledge and expertise effectively, Analyzes problems effectively</td><td>10</td></tr>
<tr><td>4</td><td>Demonstrates creativity/ originality / any innovative contribution, Professional ethics and accountability</td><td>10</td></tr>
<tr><td>5</td><td>Writes effectively, Produces high quality work/Skill Proficiency</td><td>10</td></tr>
<tr><td colspan="2">Total</td><td>50</td></tr>
</table>
Document as Evidence: Activity report along with Certificate or Declaration, duly issued and signed by the concerned authority [To be assessed during EE] should be submitted during End Examination to the parent Learner support Centre (LSC).
</td><td>
At the end of second semester, Programme Coordinator (PC)/ Supervisor of LSC and 1 (one) External Examiner will complete ‘End Exam (EE)’ for all allotted students as follows:
1. Duration of EE: After Theory EE of second Semester
2. Programme Coordinator (PC)/ Supervisor of LSC and External Expert will have 20% and 80% weightage respectively in EE.
3. Number of attempts: Till Valid Registration Period (VRP) only
4. Marks for EE: 50 Marks
<table>
<tr><th>Parameter</th><th>PC /Supervisor of LSC</th><th>External Expert</th></tr>
<tr><td>Professional Attitude</td><td>-</td><td>05 Marks</td></tr>
<tr><td>Maintenance of Daily Diary</td><td>-</td><td>10 Marks</td></tr>
<tr><td>Internship Report</td><td>05 Marks</td><td>10 Marks</td></tr>
<tr><td>Viva/Oral</td><td>05 Marks</td><td>15 Marks</td></tr>
<tr><td>Total</td><td>10 Marks</td><td>40 Marks</td></tr>
</table>
</td></tr>
</table>

SN	Type of Course	Continuous Assessment (CA)	End Examination (EE)
8.	CEP (TW) **2 Credit** 50 Marks CA: 100%	1. CEP Proposals*: 15 Marks 2. Planning community work, correspondence, formats, interactions, liaising: 10 Marks 3. CEP report**: 15 marks 4. Viva /Presentation: 10 Marks **Marks: 50 Marks**	End Examination is Not Applicable (NA)
		*__CEP Proposals__: 1) Basic structure of Society 2) Key definitions of Problem area 3) Analysis of Preliminary data **__CEP Report__: 1) Field work and data gathering 2) Analysis and reporting	

Annexure – IV

Entry level qualification to B. Sc. (Honours) programmes

SN	Academic Qualifications required for Eligibility		
A)	A candidate who has passed Standard 12th / (10+2)th / Level 4.0 examination conducted by Maharashtra State Board of Secondary and Higher Secondary Education/CBSE/ ISC/NIOS or equivalent examinations by any Other State or any other recognized Board with science subjects shall be eligible for admission to First Semester B. Sc. Programmes as per NEP 2020:		
	Groups of Science subjects/courses from		**Eligible for Any One Major in Science Discipline**
1.	1. English 2. Physics, Chemistry, Mathematics, Biology		**Any One Major from**: Physics, Chemistry, Mathematics, Botany, Zoology, Environmental Science
2.	1. English 2. Physics, Chemistry, Mathematics		**Any One Major from:** Physics, Chemistry, Mathematics, Environmental Science
3.	1. English 2. Physics, Chemistry, Biology		**Any One Major from**: Physics, Chemistry, Botany, Zoology, Environmental Science
4.	1. English 2. Vocational Course of 200 Marks 3. Physics, Chemistry, Mathematics		**Any One Major from:** Physics, Chemistry, Mathematics, Environmental Science
5.	1. English 2. Vocational Course of 200 Marks 3. Physics, Chemistry, Biology		**Any One Major from**: Physics, Chemistry, Botany, Zoology, Environmental Science
6.	1. English 2. Physics, Chemistry 3. Any one of the following Optional Course of 100 Marks : Geography, Geology, Food Science and Technology, Agriculture Science and Technology, Animal Science and Technology, Defence Studies		**Any One Major from**: Physics, Chemistry, Botany, Zoology, Environmental Science
OR			
B)	A candidate who has passed (10+3) years or (12+2) years Diploma from Maharashtra State Technical Board / a statutory or recognized board/ university in India		
	Description		**Eligible for Any One Major in Science Discipline**
1.	(10+3) years / (12+2) years Engineering Diploma		**Any One Major from:** Physics, Chemistry, Mathematics, Environmental Science
OR			
C)	A candidate who has passed Higher Secondary School Certificate (10+2) Examination with English and any of the following +2 Level HSC Vocational (MCVC) Group		
	HSC Vocational (MCVC) Group		**Eligible for Any One Major in Science Discipline**
1.	Agriculture Group or Fisheries	Horticulture (KA, KB, KC) Crop Science (LA, LB, LC) Animal Husbandry and Dairy	**Any One Major from:** Botany, Zoology, Environmental Science

SN	Academic Qualifications required for Eligibility		
	Group	Technology (MA, MB, MC)	
		Fisheries Technology (NA, NB, NC)	
2.	Catering and Food Products Technology	Catering and Food Products Technology (SA, SB, SC)	**Any One Major from:** Botany, Zoology, Environmental Science
3.	Paramedical Group	Child, Old Age and Health care services (QA, QB, QC)	**Any One Major from:** Botany, Zoology, Environmental Science
		Medical Laboratory Technician (OA, OB, OC)	**Any One Major from:** Physics, Chemistry, Zoology
		Ophthalmic Technician (RA, RB, RC)	**Any One Major :**Physics
		Radiology Technician (PA, PB, PC)	
4.	Technology Group	Electronics Technology (EA, EB, EC)	**Any One Major :**Physics
		Electrical Technology (FA. FB, FC)	

END OF DOC

DEB-UGC application for Programme approval for AY 2025-26

School of Sciences, YCMOU Nashik

(Formerly School of Architecture, Science and Technology)

Programme Project Report (PPR)

UGV01: B.Sc. (Honours) (Physics) {2025 Pattern}

A. Programme project report (PPR)

Name of Programme: 4 Year Bachelor of Science (Honours)(Physics)		
a	Programme's mission & objectives	**Mission**: The "Bachelor of Science (Honours)" is an innovative programme based on a number of core, elective and skill courses in physics. Upon graduation, the learners will be able to understand and appreciate the impact of "physics" in day-to-day life. Further, the learners will be exposed to the current trends in research about "physics". The mission is to forge a solid foundation in physics, empowering learners to confidently tackle and analyse complex scientific challenges with ease. This programme aims to cultivate strong analytical skills to prepare learners to excel in the field of physics. The programme provides a comprehensive education in both theoretical and experimental physics. Learners will engage in hands-on laboratory activities and immersive field projects or internships, ensuring they acquire not only fundamental knowledge but also practical skills vital for success in the scientific community. **Objectives**: The main objectives for offering this programme, are • Access to Science Education: To provide science education opportunities through learner Open and Distance Learning (ODL), making learning accessible and cost effective. • Deep Understanding: To ensure that learners gain a deep understanding of the fundamental principles and concepts in Physics. • Problem-Solving Abilities: To equip students with problem-solving skills, enabling them to apply scientific methodologies to address complex issues that require expertise in physics disciplines. • Laboratory Proficiency: To develop practical laboratory skills, enabling learners to design experiments, collect data, and analyse results in Physics. • Research Aptitude: To nurture research aptitude by encouraging learners to engage in interdisciplinary research projects at the undergraduate level. • Effective Communication: To enhance communication skills, allowing learners to communicate scientific findings effectively, both in writing and orally. • Flexibility and Adaptability: To prepare learners for diverse career opportunities, including academia, research, industry, and entrepreneurship, by offering a versatile skill set. • Engage in life-long learning and will have recognition.
b	Relevance of the Programme with HEI's Mission and Goals	Objects of the YCMOU (as per the YCMOU Act) which would be fulfilled by implementing the proposed program (a) To provide through instruction, teaching and training and other educational opportunities, access to larger and larger segment of

<table>
<tr><td></td><td></td><td>population, and in particular to the disadvantaged groups such as those living in remote and rural areas including working people, housewives and other adults who wish to upgrade or acquire knowledge through studies in various fields; [1(a)]

(b) To strengthen and diversify the degrees, diploma and certificate courses at various educational levels, to fulfill the knowledge, skills and development needs of the individuals, institutions and society in general, by relating, particularly, the courses, to the needs of the employment and economic development of the state on the basis of its natural and human resources; [1(b)]

(c) To promote acquisition of knowledge in a rapidly developing and changing society and to continually offer opportunity of upgrading knowledge, training and skills in the context of innovations, research and discovery in all field of human endeavor by developing educational network with the use of modern communication media and technologies appropriate for a learning society; [1(c)]

(d) To provide an innovative system of University level education, flexible and open, in regard to the methods and pace of learning, combination of courses, eligibility for enrolment, age of entry, conduct of examinations and operation of the program, with a review to promote learning and encourage excellence in all fields of knowledge; [1(d)]

(e) To contribute to the improvement of the education system in the state by providing a non-formal channel complementary to the formal system and encouraging transfer of credits and exchange of teaching staff by making a wide use of text and other software developed by the University; [1(e)]

(f) To develop innovative, need based Vocational courses and establish industry, institution linkage for developing the society; [1(f)]

(g) To provide through incidental and non-formal means, for continuing and extension of education in various cultural forms, arts, crafts and skills of the country, raising their quality and improving their availability to the people; [1(g)]

(h) To provide for the counseling and guidance to its learners; [1(j)]

(i) To provide major part of its resources and direct efforts in designing, developing and offering need-based and relevant vocational courses. [1(l)]</td></tr>
<tr><td>c</td><td>Nature of prospective target group of learners</td><td>12th /(10+2)th /Level 4.0 examination conducted by Maharashtra State Board of Secondary and Higher Secondary Education/CBSE/ISC/NIOS or equivalent examinations by any Other State or any other recognized Board with science subjects pass, including English and Physics.
OR
(10+3) years or (12+2) years Engineering Diploma pass, from Maharashtra State Technical Board / a statutory or recognized board/ university in India.
OR
Higher Secondary School Certificate (10+2) Examination with English and any of the following +2 Level HSC Vocational (MCVC) Group:
<table><tr><td>Medical Laboratory Technician (OA, OB, OC)</td></tr><tr><td>Ophthalmic Technician (RA, RB, RC)</td></tr><tr><td>Radiology Technician(PA, PB, PC)</td></tr><tr><td>Electronics Technology(EA, EB, EC)</td></tr></table></td></tr>
</table>

		Electrical Technology (FA. FB, FC) Although similar UG Programme are offered by conventional institutes, the conventional educational system offers very little freedom to learners as regards when, where, and how to learn. The proposed programme aims to provide this freedom to learners to the maximum possible extent.
d	Appropriateness of programme to be conducted in Open and Distance Learning mode to acquire specific skills and competence Specify the expected learning outcomes in terms of: 1. Knowledge Attainment: 2. Skills and Competencies: Compliances of academic, professional & occupational standards:	The proposed programme is designed in adherence to the principles of National Education Policy (NEP2020) to acquire knowledge and skills with valuable experiences through VSC, SEC, AEC, VEC, IKS, hands-on activities, projects, internships and much more. This aims to provide relevant skills as needed by the working professional to identify and solve challenging problems in physics, thus contributing to the ever-increasing demands of society and industry. The programme helps to develop scientific tempers and attitudes, which in turn can prove beneficial for society since scientific developments can make a nation or society grow at a rapid pace. After studying this programme, learners will be better equipped to learn and have a deep understanding of key physics concepts, principles, and theories relevant to the field of physics, analyze physics formulae, and are prepared to take on leadership roles in physics, governmental agencies, research institutions, and industries related to physics. This programme uses the Open and Distance (ODL) mode of education in compliance with the objective 'reach to unreached' by offering: Theory, Practical, Term-work, Field Project/OJT, courses. The teaching-learning component is offered as face-to-face counseling along with full practical and project-work activities by qualified and experienced teacher/ mentors/experts at a recognized Learner Support Center (LSC), along with continuous assessment, and offline materials and resources in printed book format or soft copy format. The UGC recently introduced a 'virtual laboratory' approach for practical courses. This university is currently working on implementing this for the proposed laboratory activities in science courses. Additionally, this programme adheres all of the prevalent academic norms and standards of the UGC-DEB. Hence, this programme is appropriate to conduct in open and distance learning mode to provide an opportunity for those aspirants who cannot take traditional education but want to improve their existing science skills and/or to acquire specified skills and competencies.
e	Instructional Design **1.** Curriculum Design **(*Outcome of Expert Committee meeting; Program Structure: specify the theory, practical,***	This B.Sc. (Honours) programme for undergraduates is well structured based on the NEP2020 framework. The entire curriculum is well organized and thoughtfully designed, featuring an updated syllabus. The four-year B.Sc. (Honours) program consists of 176 credits distributed over eight semesters, with learners required to complete 22 credits in each semester. The modular structure of the curriculum allows for multiple entry and exit options. After successfully completion of 1 to 6 semesters, learners will be awarded a three-year Bachelor of Science (B.Sc.) degree with 132 credits and if learner continue next two semester 7 and 8 then will be awarded a four-year Bachelor of Science (B.Sc.) (Honours) degree with 176 credits. These credits will be distributed among Major Courses (DSC & DEC)), Minor courses, Open Electives (OEs), Ability Enhancement Courses (AEC), Skill Enhancement Courses (SEC), Value Education Courses (VEC), Indian Knowledge System (IKS), On Job Training (OJT), Field projects(FP), Co-curricular Courses (CC), Research Methodology (RM) etc. Among all offered courses, learners have to opt the courses as per NEP2020 guidelines.

***fieldwork, project, etc components*):**

2. Total Credit Points (*including course wise*):
3. Detailed Syllabi:
4. Duration of the program (***Minimum & Maximum*):**
5. Medium of Instruction:
6. Type of Program (***General/Technical/ Professional*):**
7. Faculty and Support Staff:
8. Instructional Design & Delivery Mechanism (***Media to be used -print, audio, video, online, computer aided, web based, etc. (course wise)*):**

Student Support Service System (***Specify the provisions to be made at Head Quarter, Regional Centers, Learner Support Centers and Web based, etc*):**

Semester pattern: This programme is of total 8 semesters. Distribution of the credits are as follows :

Sem	Mandatory Courses (DSC)				Elective Courses (DSE) (4 CR)	Minor Courses (2CR)		Open Elective OE (2CR)	VSC, SEC (VSEC) (2CR)		AEC, VEC, IKS (2CR)		OJT, FP, CEP, CC (2/4 CR)	Total Courses (CR)
	Theory (T)		Practical (P)											
	4 CR	2 CR	4 CR	2 CR		T	P	T	T	TW /P	2CR (T)		TW	
I	1	-	-	1	-	-	-	2	-	2	3	-	CC (2CR)	10 (22 CR
II	1	-	-	1	-	1	-	2	-	2	2	-	CC (2CR)	10 (22 CR
CumCr.	12				00	02		08	08		10		04	44
Exit option: Award of UG Certificate in Faculty of Science- Physics (Level 4.5) with 44 credits and an additional 4 credits core NSQF course/ Internship OR Continue with Major and Minor														
III	1	1	-	1	-	1	1	1	-	1	1 (2CR)		FP (2CR) CC (2CR)	10 (22 CR
IV	1	1	-	1	-	1	1	1	1	-	1 (2CR)		CEP (2CR) CC (2CR)	10 (22 CR
CumCr.	28				00	10		12	12		14		12	88
Exit option: Award of UG Diploma in Faculty of Science-Physics (Level 5.0) with 88 credits and an additional 4 credits core NSQF course/ Internship OR Continue with Major and Minor														
V	1	1	1	-	1	1	1	-	-	1	-		FP/ CEP (2CR)	8 (22 CR
VI	1	1	1	-	1	1	1	-	-	-	-		OJT (4CR)	7 (22 CR
CumCr.	48				08	18		12	14		14		18	132
Exit option: Award of UG Degree in Physics (Level 5.5) with 132 credits OR Continue with Major and Minor														
VII	2	1	1	-	1	1 (4CR)		-	-		-		-	6 (22 CR
VIII	2	1	1	-	1	-		-	-		-		OJT (4CR)	6 (22 CR
CumCr.	76				16	22		12	14		14		22	176
Four Year UG Honours Degree in Physics and Minor in xxx with 176 credits														

Programme Structure:

SN	Course	Code	Name	CA	EE	TM	Type	CR	Min%
[Level 4.5] Semester I : [22 Credits]									
01	DSC	PHYC101	Mechanics	30	70	100	T	4	40%
02	DSC	PHYC102	Lab Activities on PHYC101	25	25	50	P	2	40%
03	OE	XXXE101	Select from other faculty OE courses List***	15	35	50	T	2	40%
04	OE	XXXE102	Select from other faculty OE courses List***	15	35	50	T	2	40%
05	VSC	PHYV101	Introduction to GeoGebra	25	25	50	TW	2	40%
06	SEC	SECS101	Basic Instrumentation Skills	25	25	50	TW	2	40%
07	AEC	AECL101	Listening and Speaking Skills in English	15	35	50	T	2	40%

		08	VEC	VECD101	Introduction to the Constitution of India	15	35	50	T	2	40%
		Select Any One from IKSK101 to IKSK105									
		09	IKS	IKSK101	भारतीय ज्ञान परंपरा – कला आणि प्राचीन भारतीय भाषा	15	35	50	T	2	40%
				IKSK102	भारतीय ज्ञान परंपरा – सामाजिक शास्त्रे	15	35	50	T	2	40%
				IKSK103	भारतीय ज्ञान परंपरा – आरोग्य शास्त्र	15	35	50	T	2	40%
				IKSK104	भारतीय ज्ञान परंपरा – विज्ञान आणि तंत्रज्ञान	15	35	50	T	2	40%
				IKSK105	Indian Knowledge System – Generic (Offered in Online Mode)	15	35	50	T	2	40%
		Select Any One from CCRX101 to CCRX106									
		10	CC	CCRX101	Health and Wellness-I	50	-	50	TW	2	40%
				CCRX102	Yoga Education-I	50	-	50	TW	2	40%
				CCRX103	Sports and Fitness-I	50	-	50	TW	2	40%
				CCRX104	Cultural Activities-I	50	-	50	TW	2	40%
				CCRX104	NSS-I	50	-	50	TW	2	40%
				CCRX106	Fine/Applied/Visual/Performing Arts-I	50	-	50	TW	2	40%
		[Level 4.5] Semester II : [22 Credits]									
		11	DSC	PHYC103	Electricity & Magnetism	30	70	100	T	4	40%
		12	DSC	PHYC104	Lab Activities on PHYC103	25	25	50	P	2	40%
		13	Minor	XXXM101	To be Selected from Minor Courses List **other than Major (DSC)****	15	35	50	T	2	40%
		14	OE	XXXE103	Select from other faculty OE courses List***	15	35	50	T	2	40%
		15	OE	XXXE104	Select from other faculty OE courses List***	15	35	50	T	2	40%
		16	VSC	PHYV102	Solar Panel System	25	25	50	TW	2	40%
		17	SEC	SECS102	MS Excel with AI	25	25	50	TW	2	40%
		18	AEC	AECL102	Reading and Writing Skills In English	15	35	50	T	2	40%
		19	VEC	VECD102	Environmental Education	15	35	50	T	2	40%
		Select Any One from CCRX107 to CCRX112									
		20	CC	CCRX107	Health and Wellness-II	50	-	50	TW	2	40%
				CCRX108	Yoga Education-II	50	-	50	TW	2	40%
				CCRX109	Sports and Fitness-II	50	-	50	TW	2	40%
				CCRX110	Cultural Activities-II	50	-	50	TW	2	40%

			CCRX111	NSS-II	50	-	50	TW	2	40%
			CCRX112	Fine/Applied/Visual/Performing Arts-II	50	-	50	TW	2	40%
Exit option: Award of UG Certificate in The Faculty of Science- Physics (Level 4.5) with 44 credits and an additional 4 credits core NSQF course/ Internship OR Continue with Major and Minor										
[Level 5.0] Semester III : [22 Credits]										
21	DSC	PHYC201	Thermodynamics & Statistical Mechanics		30	70	100	T	4	40%
22	DSC	PHYC202	Ancient Indian Physics		15	35	50	T	2	40%
23	DSC	PHYC203	Lab Activities on PHYC201		25	25	50	P	2	40%
24	Minor	XXXM201	To be Selected from Minor Courses List **other than Major (DSC)****		15	35	50	T	2	40%
25	Minor	XXXM202	To be Selected from Minor Courses List **other than Major (DSC)****		25	25	50	P	2	40%
26	OE	XXXE201	Select from other faculty OE courses List***		15	35	50	T	2	40%
27	VSC	PHYV201	Electrical Circuit and Network Skills		25	25	50	P	2	40%
28	AEC	AECL201	श्रवण आणि संभाषण कौशल्ये		15	35	50	T	2	40%
29	FP	PHYF204	Field Project		50	-	50	TW	2	40%
Select Any One from CCRX201 to CCRX206										
30	CC	CCRX201	Health and Wellness-III		50	-	50	TW	2	40%
		CCRX202	Yoga Education-III		50	-	50	TW	2	40%
		CCRX203	Sports and Fitness-III		50	-	50	TW	2	40%
		CCR204	Cultural Activities-III		50	-	50	TW	2	40%
		CCRX205	NSS-III		50	-	50	TW	2	40%
		CCRX206	Fine/Applied/Visual/Performing Arts-III		50	-	50	TW	2	40%
[Level 5.0] Semester IV : [22 Credits]										
31	DSC	PHYC205	Wave Motion & Optics		30	70	100	T	4	40%
32	DSC	PHYC206	Basics of Mathematical Methods in Physics		15	35	50	T	2	40%
33	DSC	PHYC207	Lab Activities on PHYC205		25	25	50	P	2	40%
34	Minor	XXXM203	To be Selected from Minor Courses List **other than Major (DSC)****		15	35	50	T	2	40%
35	Minor	XXXM204	To be Selected from Minor Courses List **other than Major (DSC)****		25	25	50	P	2	40%
36	OE	XXXE202	Select from other faculty OE courses List***		15	35	50	T	2	40%

37	SEC	SECS201	Intellectual Property Rights	15	35	50	T	2	40%
38	AEC	AECL202	वाचन आणि लेखन कौशल्ये	15	35	50	T	2	40%
39	CEP	PHYG208	Awareness of Sustainable Development Goals-I	50	-	50	TW	2	40%
Select Any One from CCRX207 to CCRX212									
40	CC	CCRX207	Health and Wellness-IV	50	-	50	TW	2	40%
		CCRX208	Yoga Education- IV	50	-	50	TW	2	40%
		CCRX209	Sports and Fitness- IV	50	-	50	TW	2	40%
		CCRX210	Cultural Activities- IV	50	-	50	TW	2	40%
		CCRX211	NSS- IV	50	-	50	TW	2	40%
		CCRX212	Fine/Applied/Visual/Performing Arts- IV	50	-	50	TW	2	40%
Exit option: Award of UG Diploma in in the Faculty of Science-Physics (Level 5.0) with 88 credits and an additional 4 credits core NSQF course/ Internship OR Continue with Major and Minor									
[Level 5.5] Semester V : [22 Credits]									
41	DSC	PHYC301	Classical & Quantum Mechanics	30	70	100	T	4	40%
42	DSC	PHYC302	Solid State Physics	15	35	50	T	2	40%
43	DSC	PHYC303	Lab Activities on PHYC301 & PHYC302	50	50	100	P	4	40%
Select Any One from PHYC304, PHYC305, PHYC306									
44	DSE	PHYC304	Fundamentals of Astronomy & Astrophysics	30	70	100	T	4	40%
	DSE	PHYC305	Semiconductor Technology	30	70	100	T	4	40%
	DSE	PHYC306	Electronics	30	70	100	T	4	40%
45	Minor	XXXM301	To be Selected from Minor Courses List **other than Major (DSC)****	15	35	50	T	2	40%
46	Minor	XXXM302	To be Selected from Minor Courses List **other than Major (DSC)****	25	25	50	P	2	40%
47	VSC	PHYV301	Lab Activities on Basic Electronics Devices	25	25	50	P	2	40%
Select PHYF307 or PHYG308									
48	FP	PHYF307	Field Project	50	-	50	TW	2	40%
	CEP	PHYG308	Awareness of Sustainable Development Goals - II	50	-	50	TW	2	40%
[Level 5.5] Semester VI : [22 Credits]									
49	DSC	PHYC309	Nuclear Physics & Radiation Safety	30	70	100	T	4	40%
50	DSC	PHYC310	Electromagnetic Theory	15	35	50	T	2	40%
51	DSC	PHYC311	Lab Activities on PHYC309 & PHYC310	50	50	100	P	4	40%

Select Any One from PHYC312, PHYC313, PHYC314									
52	DSE	PHYC312	Instrumentation	30	70	100	T	4	40%
	DSE	PHYC313	Energy Storage Devices	30	70	100	T	4	40%
	DSE	PHYC314	Embedded System	30	70	100	T	4	40%
53	Minor	XXXM303	To be Selected from Minor Courses List **other than Major (DSC)****	15	35	50	T	2	40%
54	Minor	XXXM304	To be Selected from Minor Courses List **other than Major (DSC)****	25	25	50	P	2	40%
55	OJT	PHYO315	On Job Training	50	50	100	TW	4	40%
Exit option: Award of UG Degree in PHYSICS (Level 5.5) with 132 credits OR Continue with Major and Minor									
[Level 6.0] Semester VII : [22 Credits]									
56	DSC	PHYC401	Classical Mechanics	30	70	100	T	4	40%
57	DSC	PHYC402	Electronic Devices	30	70	100	T	4	40%
58	DSC	PHYC403	Mathematical Methods in Physics	15	35	50	T	2	40%
59	DSC	PHYC404	Physics - I	50	50	100	P	4	40%
60	RM	RESR405	Research Methodology	30	70	100	T	4	40%
Select Any One from PHYC406, PHYC407									
61	DSE	PHYC406	Experimental Techniques in Physics	30	70	100	T	4	40%
	DSE	PHYC407	Physics of LASERs	30	70	100	T	4	40%
[Level 6.0] Semester VIII : [22 Credits]									
62	DSC	PHYC409	Atomic & Molecular Physics	30	70	100	T	4	40%
63	DSC	PHYC410	Electrodynamics	30	70	100	T	4	40%
64	DSC	PHYC411	Quantum Mechanics -I	15	35	50	T	2	40%
65	DSC	PHYC412	Physics II – Practical (Computational Methods using 'C')	50	50	100	P	4	40%
66	OJT	PHYO413	On Job Training	50	50	100	TW	4	40%
Select Any One from PHYC415, PHYC416									
67	DSE	PHYC415	Fundamentals of Material Science	30	70	100	T	4	40%
	DSE	PHYC416	Medical Physics	30	70	100	T	4	40%
Four Year UG Honours Degree in PHYSICS and Minor in XXX with 176 credits									

Minor Courses offered in Physics discipline for other discipline of same faculty or different faculty :

a) These minor courses may be selected by learners who have not selected Physics as Major

SN	Course	Code	Name	CA	EE	TM	Type	CR	Min%
Semester II									
01	Minor	PHYM101	Basics of Electricity & Magnetism	15	35	50	T	2	40%
Semester III									
02	Minor	PHYM201	Thermal Physics	15	35	50	T	2	40%
03	Minor	PHYM202	Lab Activities on PHYM201	25	25	50	P	2	40%
Semester IV									
04	Minor	PHYM203	Oscillations & Optics	15	35	50	T	2	40%
05	Minor	PHYM204	Lab Activities on PHYM203	25	25	50	P	2	40%
Semester V									
06	Minor	PHYM301	Computational Physics	15	35	50	T	2	40%
07	Minor	PHYM302	Lab Activities on PHYM301	25	25	50	P	2	40%
Semester VI									
08	Minor	PHYM303	Basics of Instrumentation	15	35	50	T	2	40%
09	Minor	PHYM304	Lab Activities on PHYM303	25	25	50	P	2	40%

b) Physics learners may select minor courses from the following discipline:

SN	**Major in:**	**Minor in (Anyone of the following other than Major)**: Refer Annexure - I
1	**Physics**	Chemistry, Mathematics, Botany, Zoology, Environmental Science

Open Elective (OE) Courses in Physics offered for other Faculty :

SN	Course	Code	Name	CA	EE	TM	Type	CR	Min%
Semester I									
01	OE	PHYE101	Physics of Daily Life	15	35	50	T	2	40%
02	OE	PHYE102	Materials in Daily Life	15	35	50	T	2	40%
Semester II									
03	OE	PHYE103	Renewable Energy for	15	35	50	T	2	40%

			Daily life						
04	OE	PHYE104	Energy Audit	15	35	50	T	2	40%
Semester III									
05	OE	PHYE201	Physics of Sound & Music	15	35	50	T	2	40%
Semester IV									
06	OE	PHYE202	Physics in Sports	15	35	50	T	2	40%

Total Credits: **132** and **Total Courses**: **55** {3Y UG degree}

Total Credits: **176** and **Total Courses**:**67** {4Y UG degree}

Detailed Syllabi: Available at
https://drive.google.com/drive/folders/13lNyj1PT7qN-AAAi2eE8fwDAsCQFWMQz?tid=0B451Yjwt_acQR1VPSUQ4Qotvams

- Programme Outcomes and Courses Outcomes: Refer **Annexure – II**

Minimum programme duration:

- 3 yrs {for 3Y B.Sc. Degree} and 4 yrs {4Y B.Sc. (Honours) Degree}

Maximum Programme Duration:

- 6 yrs {for 3Y B.Sc. Degree} and 8 yrs {4Y B.Sc. (Honours) Degree}

Medium of Instruction: English

Type of Program: General

Faculty and Support Staff:

Director, School of Sciences: Prof. Chetana Kamlaskar
Academic coordinators: Ms. Sharayu S. Kudal
Ms. Akanksha A. Ghumare

Instructional Design & Delivery Mechanism :

In order to ensure and maintain the quality in science education, face-to-face counseling for theory and activities type of courses will be conducted at the designated LSCs during Saturdays and Sundays.

- **Minimum number of face-to-face counseling sessions:** 12 (for 4 Credits)
  - (For each theory type of course of 4 credits duration of each counseling session shall be 01 Clock Hour)
  - (For each Practical/Project type of course of 4 credits duration of each counseling session shall be 02 Clock Hour).
- **Minimum number of face-to-face counseling sessions:** 6 (for 2 Credits)
  - (For each theory type of course of 2 credits duration of each counseling session shall be 01 Clock Hour)
  - (For each Practical/Term work type of course of 2 credits duration

<table>
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<td>of each counseling session shall be 02 Clock Hour).
• Number of On Job Training (OJT) hours: 120 hr (for 4 Credits)
- One month ‘On Job Training (OJT)’ or Internship (Total Study hours 120 hrs including Internship Report)
• Required study efforts:
1. For 3Y UG degree: Total 3960 Hours including Self-Study during all 06 semesters. 660 Hours (including Self-Study) during each semester.
2. For 4Y UG (Honours) degree: Total 5280 Hours including Self-Study during all 08 semesters. 660 Hours (including Self-Study) during each semester.
• Attendance: Minimum 80% attendance recommended for all activity type of courses
• eBook: eBook in SLM format for each course (Free Download from University website) at all semesters I to semester VIII
Student Support Service System:
At headquarter: Support from School, SSD, Evaluation Division and Exam Unit-3
At Regional Centers: From all 8 regional centers within MH
At Learner Support Centers: Recognized Learner support centers within MH
Web Based:
http://www.ycmou.ac.in
http://ycmou.digitaluniversity.ac</td>
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<td>f</td>
<td>Procedure for admissions, curriculum transaction and evaluation
1. Define the Admission Policy (including web based tools to be adopted:
2. Eligibility Criteria:
3. Fee Structure:
4. Financial assistance to</td>
<td>All information related to the programme like admission policy, eligibility and fee structure, course curriculum, medium of instruction, evaluation policy - online home assignments and end examination pattern, SLMs etc. are transacted through prospectus, university website and official notification.
Admissions procedure: A customized “Online Annual Admission system” available at DU portal
http://ycmou.digitaluniveristy.ac
Online payment facility is made available using a credit card or debit card or internet banking.
Admission Eligibility: Entry level qualification to B. Sc. (Honours) programmes
<table>
<tr><th>SN</th><th colspan="2">Academic Qualifications required for Eligibility</th></tr>
<tr><td rowspan="2">A)</td><td colspan="2">A candidate who has passed Standard 12th / (10+2)th / Level 4.0 examination conducted by Maharashtra State Board of Secondary and Higher Secondary Education/CBSE/ ISC/NIOS or equivalent examinations by any Other State or any other recognized Board with science subjects shall be eligible for admission to First Semester B. Sc. Programmes as per NEP 2020:</td></tr>
<tr><td>Groups of Science subjects/courses from</td><td>Eligible for Any One Major in Science Discipline</td></tr>
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	Learners (if any): 5. Activity planner of all academic activities of the academic session: 6. Exit Option- UG Certificate UG Diploma, UG Degree: Policy for Evaluation of learner progress along with methods and tools:	1.	1. English 2. Physics, Chemistry, Mathematics, Biology	**Any One Major from: Physics**, Chemistry, Mathematics, Botany, Zoology, Environmental Science
		2.	1. English 2. Physics, Chemistry, Mathematics	**Any One Major from: Physics**, Chemistry, Mathematics, Environmental Science
		3.	1. English 2. Physics, Chemistry, Biology	**Any One Major from: Physics**,, Chemistry, Botany, Zoology, Environmental Science
		4.	1. English 2. Vocational Course of 200 Marks 3. Physics, Chemistry, Mathematics	**Any One Major from: Physics**, Chemistry, Mathematics, Environmental Science
		5.	1. English 2. Vocational Course of 200 Marks 3. Physics, Chemistry, Biology	**Any One Major from: Physics**, Chemistry, Botany, Zoology, Environmental Science
		6.	1. English 2. Physics, Chemistry	3. Any one of the following Optional Course of 100 Marks: Geography, Geology, Food Science and Technology, Agriculture Science and Technology, Animal Science and Technology, Defence Studies — **Any One Major from: Physics**, Chemistry, Environmental Science
				3. Any one of the following Optional Course of 100 Marks: Food Science and Technology, Agriculture Science — **Major**: Botany
				3. Optional Course of 100 Marks: Animal Science and Technology — **Major**: Zoology
		OR		
		B)	A candidate who has passed (10+3) years or (12+2) years Diploma from Maharashtra State Technical Board / a statutory or recognized board/ university in India	
			Description	**Eligible for Any One Major in Science Discipline**
		1.	(10+3) years / (12+2) years Engineering Diploma	**Any One Major from: Physics**, Chemistry, Mathematics, Environmental Science
		OR		
		C)	A candidate who has passed Higher Secondary School Certificate (10+2) Examination with English and any of the following +2 Level HSC Vocational (MCVC) Group	
			HSC Vocational (MCVC) Group	**Eligible for Any One Major in Science Discipline**

1.	Agriculture Group or Fisheries Group	Horticulture (KA, KB, KC)	**Any One Major from:** Botany, Environmental Science
		Crop Science (LA, LB, LC)	
		Animal Husbandry and Dairy Technology (MA, MB, MC)	**Any One Major from:** Zoology, Environmental Science
		Fisheries Technology (NA, NB, NC)	
2.	Catering and Food Products Technology	Catering and Food Products Technology (SA, SB, SC)	**Any One Major from:** Botany, Zoology, Environmental Science
3.	Paramedical Group	Child, Old Age and Health care services (QA, QB, QC)	**Any One Major from:** Botany, Zoology, Environmental Science
		Medical Laboratory Technician (OA, OB, OC)	**Any One Major from:** **Physics**, Chemistry, Zoology
		Ophthalmic Technician (RA, RB, RC)	**Major: Physics**
		Radiology Technician (PA, PB, PC)	
4.	Technology Group	Electronics Technology (EA, EB, EC)	**Major: Physics**
		Electrical Technology (FA, FB, FC)	

Total programme Fee: Approximately Total ₹ 28,724/- for all 06 Semesters and Total ₹ 52,292/- for all 08 Semesters, which is duly approved by the university authorities [*Will be updated as per University Policy decision.*]

Curriculum Transaction:

- 01 SLM e-Book will be developed for each theory course
- Total 12/06 Face-To-Face counseling sessions, each of 60 Minutes duration, will be provided at respective learner support center, for each theory course.
- Total 12/18 Face-To-Face counseling sessions, each of 120 Minutes duration, will be provided at respective learner support center, for each practical/Field project/ OJT/ CC courses. In the laboratory, instruction would be given for the experiments followed by demonstration and finally the learners have to do the experiments individually.
- Curriculum updation will be after every 3 years

Activity planner: This University and School will follow the Programme Calendar declared by UGC/DEB, New Delhi time to time. Teaching-Learning of students shall start from 01-September/01-Feb every year. Online continuous assessment proposed for all offered programmes.

SN	Activity Description	Yearly Pattern/ Odd semesters like 01, 03, 05 and 07 From 01-Sep Till 31-Jan	Even semesters like 02, 04, 06 and 08 From 01-Feb Till 31-Jul
Online Admission: offered on Annual basis for 2 semesters in each academic year. Only for 'C149: Certificate progarmme in Beekeeping', Admissions shall be offered on Winter and Summer batch basis.			
01	Fresh and Further Yearly Admission	From 1st June 2025 Till Sept 2025 (For C149, Winter Batch: From Jul)	NA (For C149, Summer Batch: From Jan)
Teaching – Learning at the resp Learning Support Centers/ SCs for all Theory, Practical, Term-Work, Studio, Project, FP & OJT Courses			
02	Teaching – Learning (16 Weeks) & Backlog Clearing	**From 1st Sept 2025 Till 14th Dec 2025**	**From 18th Jan 2026 Till 19th April 2026**
Online End Exam (EE) Form Submission (Required only for Repeater Students)			
03	**Online** EE Form Submission by SCs/ students at University	On or Before 21-Oct	On or Before 23-Apr
Continuous Assessment (CA) Submission			
04	CA Availability	August 2025	March 2025
05	CA Submission by Students	Upto last week of Dec 2025	Upto first week of Apr 2026
End Examination (EE) (Required only for Non-Repeater Students)			
07	**Online** EE Form Submission by SCs/ students at University	Upto third week of Oct 2025	Upto first week of Apr 2026
07	**End Exam for Theory Courses**	**From first week of Jan 2026**	**From first week of May 2026**
08	EE for Activity Courses (Pr, TW, PW, STW, SV)	Immediately after/ before the schedule of the end exam for theory courses, but positively before 1st Dec 2025 to 31st Dec 2025	Immediately after/ before the schedule of the end exam for theory courses, but positively before 10th Apr 2026 to 10th May 2026
09	OJT/Field Project (Completion Report/Presentation/Viva)	After Winter exam - Within One Month	After Summer exam - Within One Month
10	End Exam Result Declaration	Within 45 days from the last day of End Exam	Within 45 days from the last day of End Exam
Semester End Vacation			

10	Semester End Vacation	Jan	July	

Policy:
Refer Evaluation pattern given in Annexure III.

For exit option:

1. **Multiple Entry Multiple Exit Option**:
   Compliance with MS G.R. No. NEP-2022/CR No. 09/VISHI-3/शिकाना, dated 20April, 2023.

SN	Level of the Programme	Entry Option (with criteria)	Exit Option (with criteria)
1	Certificate Level	12th / (10+2)th / Level 4.0 examination conducted by Maharashtra State Board of Secondary and Higher Secondary Education/CBSE/ ISC/NIOS or equivalent examinations by any Other State or any other recognized Board with science subjects pass, including English and Physics **OR** (10+3) years or (12+2) years Engineering Diploma from Maharashtra State Technical Board / a statutory or recognized board/ university in India. **OR** Higher Secondary School Certificate (10+2) Examination with English and any of the following +2 Level HSC Vocational (MCVC) Group Pass (Listed Above)	Award of UG Certificate in the Faculty of Science - Physics (Level 4.5) with 44 credits and an additional 4 credits core NSQF course/ Internship.
2	Diploma Level	UG Certificate in the Faculty of Science – Physics (Level 4.5) with 40-44 credits	Award of UG Diploma in the Faculty of Science – Physics (Level 5.0) with 88 credits and an additional 4 credits core NSQF course/ Internship
3	Degree Level	UG Diploma in the Faculty of Science – Zoology (Level 5.0) with 88 credits	Award of UG Degree in Physics with 132 credits

g	Requirement of the Laboratory Support and	Laboratory requirement and Library Resources – Yes. Being mandatory requirement of the programme, Institutes/Colleges affiliated with conventional university offering B.Sc. (Honours) (Physics)

	Library Resources: 1. Laboratory Support to the learners (*if any*): 2. Provision of Practical book for learners (*if any*): Provision of Virtual Reality Methods for Practical in case of Online learning (*if any*):	will be only recognized as a Learner support center of this university for this programme. So, requirement of laboratory support and library resources will be automatically ensured. Additionally, school provides practical workbook in the form SLM book and other learning resources to all enrolled learners. University has already initiated in-house Science Laboratory development task at HQ, these labs will be made available to the enrolled learners in future. **Recommended**: Recognized LSCs with • Computer infrastructure with Wi-Fi/broadband connection with Physics related software/tool and Library facilities
h	Cost Estimate of the Program and the Provisions: Indicate the Budgetary Requirement for: 1. Programme Development 2. Program Delivery Program Maintenance	Budget provision for this development under A.27.P.38: Fees/Royalties/ Honorarium to Writer/Editors/Trans. SLM development cost: approximately ₹ 60,00,000/-
i	Quality Assurance Mechanism and expected Program Outcomes*: 1. Define the Review Mechanism of the Program for enhancing the standards of curriculum, instructional design relevant to professional requirements: 2. Define Program Benchmark Statements: 3. Mechanism for	B.Sc. (Honours) programme is designed to provide scientific as well as professional level competency to learners, and offers advanced theoretical as well as practical knowledge to learners. This programme enables the learner to develop interest in knowing more about the Physics and to develop research attitude. University has policy to review and revise every course at least once in five years of its launching. **Quality Assurance Mechanism**: The following key result areas will be closely monitored. • Well qualified and experienced experts nomination on Programme Advisory Committee(PAC) for design and development of relevant course content • Well qualified subject experts for SLM development and Evaluation task • Enrolment of student (Equated Access) • Equal weightage for each credit in learner evaluation • Demonstrate in-depth knowledge of Physics, both in theory and practical • Examination Results • Placements/satisfaction of passing out students • Administrative/stakeholder feedback • Centre for Internal Quality Assurance (CIQA) to ensure quality of offered science programmes

	Monitoring the effectiveness of the program: ***(Minimum standards must adhere to "UGC Open and Distance Learning Programmes and Online Programmes Regulations, 2020" & directions of the Statutory Bodies of the University)**	**Expected Program Outcomes:** After successful completion of this programme, students will be able to • Access Science Education: Take advantage of science education opportunities through Open and Distance Learning (ODL), making learning accessible and cost effective. • Enhance Skills: Improve their skills to increase job opportunities or start their own businesses. • Understand Key Concepts: Show a good understanding of important areas in Physics, such as Mechanics, Optics, Thermodynamics, Electricity and Magnetism, Solid State Physics, Electronics, Statistical Physics, Mathematical Physics, and Quantum Mechanics. • Use Laboratory Equipment: Skilfully use laboratory tools, materials, and computer software. • Apply Ethical Standards: Understand and follow ethical guidelines in both personal and professional life. • Analyse Information: Read and critically analyse ideas in textbooks and science magazines aimed at undergraduate learners. • Prepare for Careers: Get ready for further study in Physics or for jobs in science-related fields in both the public and private sectors. Also engage in life-long learning and will have recognition

B. **Duration & Nomenclature**

Name of Programme :-	4 year Bachelor of Science (Honours) (Physics)
Medium	English
Year	2026-27
Level	UG ,Level 4.5
Academic Session	July onwards
Entry Qualification (as per the Specification of Degrees, 2014)	A candidate who has passed Standard 12^{th} / $(10+2)^{th}$ / Level 4.0 examination conducted by Maharashtra State Board of Secondary and Higher Secondary Education/ CBSE/ ISC/NIOS or equivalent examinations by any Other State or any other recognized Board with science subjects, including English and Physics. OR A candidate who has passed (10+3) years or (12+2) years Engineering Diploma from Maharashtra State Technical Board / a statutory or recognized board/ university in India. OR A candidate who has passed Higher Secondary School Certificate (10+2) Examination with English and any of the following +2 Level HSC Vocational (MCVC) Group: Medical Laboratory Technician (OA, OB, OC) Ophthalmic Technician (RA, RB, RC) Radiology Technician(PA, PB, PC) Electronics Technology(EA, EB, EC) Electrical Technology (FA. FB, FC) For details Refer **Appendix IV**
Duration (as per the Specification of Degrees, 2014)	4 Year
Name of the Department	School of Sciences

C. **Mode of Evaluation**

Year	2026-27	
Whether Weightages to continuous assessment and end semester examinations or term end examinations as per clause mentioned in Regulations	Yes 1. 30% - 70% weightage Pattern for theory 2. 50% - 50% Weightage pattern for Practical/OJT/VSC/SEC* 3. 100% Weightage for Continuous Assessment for FP/CC/CEP * only one SEC course is Theory type	
Examination Scheme	Formative and Summative	
Percentage of Continuous Assessment (%)	Theory	30%
	Practical/OJT/VSC/SEC* * only one SEC course is Theory type	50%
	CC/CEP/FP	100%
	Passing %	40%
Percentage of Term End Examination (%)	Theory	70%
	Practical/OJT/VSC/SEC* * only one SEC course is Theory type	50%
	Passing %	40%
Pass or Fail Criteria	40% for Pass	
Pass/Fail Criteria (% Pass Marks)	40% and above - Pass Below 40 % - Fail	

D. Mode of Examination

Whether examination through Online (For ODL Programs)	No

E. SLM Development (Submit all SLM in pdf in pen drive and prepare the SLM availability sheet in the order as per sample in pdf for each program separately)

Particulars	% SLM in house developed	% SLM in collaboration with HEI(It should not be more than 40% of total SLM .If it is in collaboration then provide MOU in Soft & Hard copy
Printing Material	100%	–
Audio-Video Material	-	–
Online Material	Yes [pdf of SLMs]	–
Compute based Material	–	–

F. Program wise faculty details (Requirement of Minimum three faculty not below the rank of Assistant Professor to be furnished in the following format – to be taken from Establishment

Sr. No.	Emp. No	Name of the Faculty	Designation	Date of Joining	Qualification	Specialization	Teaching experience	Address	Phone no	Email	Appointment letter
1	-	Ms. Sweta D. Kapade	Academic Coordinator	13/01/2020	M.Sc. Physics B.Ed. JRF NET	Physics	08 Years	YCMOU	9156104758	Swetakapade222@gmail.com	
2	Y1109	Ms. Sharayu S. Kudal	Academic Coordinator	07/04/2025	M.Sc. Physics B.Ed. SET-Physical Science	Physics	02 Years	YCMOU	9511681017	sharayukudal@gmail.com	
3	Y1120	Ms. Akanksha A. Ghumare	Academic Coordinator	01/07/2025	M.Sc. Physics SET-Physical Science	Physics	-	YCMOU	9699838409	ghumareakanksha11@gmail.com	

G. List of Learner Support Centres Program wise and Region wise to be submitted as per following format. (We have intimated the same to Director SSD. **You are requested to give him the list of programs for which the LSCs data is required.**) – To be taken from SSD Director

Sr. No	Study centre code	Name & Address of LSC	Name of the HEI to which college/Institute is affiliated (where LSC is established)	Whether the College /Institute Private or Govt. (where LSC is established)	Name and Contact Details of Coordinator/ counsellor :	Qualification of Coordinator/ Counsellor :	No. of Counsellor :	Name of Proposed Programmes/ Course from July, 2023 onwards:	Approved	Not Approved with Reason

Appendix – I

Minor Courses offered from School of Sciences for other discipline of same faculty or different faculty other than Physics as a Major

LEVEL	SEM	Credits	Course Type	Chemistry	Mathematics	Botany	Zoology	Environmental Science
4.5	II	2	T	**CHEM101:** Basic of Physical Chemistry	**MATM101:** Foundation of Mathematics	**BOTM101**: Plant Diversity	**ZOOM101:** Animal Diversity of Invertebrates	**EVSM101:** Fundamentals of Environment
5.0	III	2	T	**CHEM201:** Introduction to Organic Chemistry	**MATM201:** Fundamentals of Calculus	**BOTM201:** Morphology and Anatomy of Flowering Plants	**ZOOM201:** Principle of Ecology	**EVSM201:** Wildlife Biology
		2	P	**CHEM202:** Lab Activities on CHEM201	**MATM202:** Practical Based on MATM201	**BOTM202:** Lab Activities on BOTM201	**ZOOM202:** Lab Activities on ZOOM201	**EVSM202:** Lab Activities on EVSM201
	IV	2	T	**CHEM203:** Introduction to Inorganic Chemistry	**MATM203:** Applied Linear Algebra	**BOTM203:** Plant Physiology	**ZOOM203:** Fundamentals of Cell Biology	**EVSM203:** Water & Noise Quality
		2	P	**CHEM204:** Lab Activities on CHEM203	**MATM204:** Practical Based on MATM203	**BOTM204**: Lab Activities on BOTM203	**ZOOM204:** Lab Activities on ZOOM203	**EVSM204:** Lab Activities on EVSM203
5.5	V	2	T	**CHEM301:** Advanced Physical Chemistry	**MATM301:** Introductory Differential Equations	**BOTM301:** Introduction to Cytology	**ZOOM301:** Introduction to Aquatic Biology	**EVSM301:** Air & Soil Quality
		2	P	**CHEM302:** Lab Activities on CHEM301	**MATM302:** Practical Based on MATM301	**BOTM302:** Lab Activities on BOTM301	**ZOOM302:** Lab Activities on ZOOM301	**EVSM302:** Lab Activities on EVSM 301
	V	2	T	**CHEM303:** Introduction to Organic and Inorganic Chemistry	**MATM303:** Numerical Methods	**BOTM303:** Plant Genetics and Variation	**ZOOM303:** General Parasitology	**EVSM303:** Environmental Governance
		2	P	**CHEM304:** Lab Activities on CHEM303	**MATM304:** Practical Based on MATM303	**BOTM304:** Lab Activities on BOTM303	**ZOOM304:** Lab Activities on ZOOM303	**EVSM304:** Lab Activities on EVSM 303

Annexure – II

Programme Objectives, Scope of the Programme & Programme Outcomes (PO)

And

Course Outcomes (CO)

Programme Name: 4 Year Bachelor of Science (Honours) (Physics)		
1	**Programme Objectives**	This programme has the following broad objectives: • Interdisciplinary Competence: To provide learners with a strong foundation in both Physics, fostering interdisciplinary knowledge and skills. • Deep Understanding: To ensure that learners gain a deep understanding of the fundamental principles and concepts in Physics. • Problem-Solving Abilities: To equip learners with problem-solving skills, enabling them to apply scientific methodologies to address complex issues that require expertise in physics discipline. • Laboratory Proficiency: To develop practical laboratory skills, enabling learners to design experiments, collect data, and analyze results in Physics. • Research Aptitude: To nurture research aptitude by encouraging learners to engage in interdisciplinary research projects at the undergraduate level. • Effective Communication: To enhance communication skills, allowing learners to communicate scientific findings effectively, both in writing and orally. • Ethical Responsibility: To instill ethical values and academic integrity, promoting responsible conduct in scientific research and experimentation. • Flexibility and Adaptability: To prepare learners for diverse career opportunities, including academia, research, industry, and entrepreneurship, by offering a versatile skill set.
2	**Scope of the Programme**	After successful completion of this programme, learners may get opportunities in various fields/sectors to work as • Flexible Career Paths: Graduates of this Programme are well-prepared for diverse career opportunities, including academia, research, industry, and entrepreneurship/Start-up. They can pursue careers in areas such as nanotechnology, materials science, renewable energy, and more. • Career opportunities in both private and government sector/ in India and abroad: Physicist, Researcher, R & D Scientist, Subject Matter Expert, Technician, Radiologist, Content Developer
3	**Programme Outcome**	After successful completion of this programme, learners will be able to • Demonstrate interdisciplinary competence by applying principles from Physics to solve real-world problems. • Exhibit a profound understanding of core concepts and theories in Physics. • Excel in critical thinking and problem-solving, addressing complex issues that span both major and minor disciplines of Physics. • Possess proficiency in laboratory techniques, enabling the design and

<table>
<tr><td></td><td></td><td>execution of experiments in Physics.
Engage in interdisciplinary research projects and contribute to scientific advancements in physics discipline.
Communicate scientific findings effectively, both in written reports and oral presentations.
Adhere to ethical standards and academic integrity in research and experimentation of science faculty.
Adapt to diverse career opportunities in physics discipline, showing flexibility in their choice of career paths.
Collaborate effectively in multidisciplinary teams, displaying leadership and teamwork skills.
Stay informed about contemporary scientific issues, including their societal implications.</td></tr>
<tr><td>4</td><td>Course Outcomes</td><td>For more details refer Syllabus file
<table>
<tr><th>SN</th><th>Course Code & Name</th><th>Course Outcomes
After successful completion of this course, students should be able to –</th></tr>
<tr><td colspan="3">Semester I</td></tr>
<tr><td>1.</td><td>PHYC101:
Mechanics</td><td>Understand Vector Algebra and Vector Calculus, physical interpretation of gradient, divergence and curl.
Explain gravitational field and potential and understanding of Kepler’s laws of planetary motion.
Understand different frames of references and conservation laws.
Understand the dynamics of rigid body and concept of moment of inertia. Study of moment of inertia of different bodies and its applications.
Explore the properties of matter, response of the classical systems to external forces and their elastic deformation and its applications.</td></tr>
<tr><td>2.</td><td>PHYC102:
Lab Activities on PHYC101</td><td>Recognize the vital role of experimental physics in industry, particularly in using instruments to explore mechanical properties.
Understand various reference frames and fundamental conservation laws in physics.
Attain precision and accuracy in measurements through hands-on laboratory experiments.</td></tr>
<tr><td>3.</td><td>PHYE101: Physics of Daily Life

(Offer For other faculty)</td><td>Understand, use and apply the scientific knowledge of physics.
Recognize and apply basic physical principles related to climate, human body Technology and earth’s atmosphere and related phenomena.
Use basic physics concepts to navigate everyday life.</td></tr>
<tr><td>4.</td><td>PHYE102:
Materials in Daily Life</td><td>Describe the physical properties of materials such as conductivity, strength, and flexibility.
Analyse how the physical properties of</td></tr>
</table></td></tr>
</table>

				(Offer For other faculty)	materials determine their practical uses in various industries. • Discuss recycling processes, sustainable materials, and the importance of eco-friendly alternatives. • Explore the use of semiconductors, magnetic materials, and nanomaterials in modern technology. • Apply basic physics principles to explain how materials respond to mechanical, thermal, electrical, and magnetic forces.
			5.	**PHYV101:** Introduction to GeoGebra	• Gain hands-on experience with GeoGebra software. • Use GeoGebra to model and solve mathematical problems. • Demonstrate proficiency in geometric constructions, algebraic graphing, and basic calculus using GeoGebra. • Improve their understanding of mathematical concepts through interactive exploration. • Create visual presentations of mathematical solutions using technology.
			6.	**SECS101:** Basic Instrumentation Skill	• Demonstrate competence in using various instruments and equipment. • Safely conduct experiments and collect reliable data. • Analyse and interpret experimental results effectively. • Apply instrumentation skills in their respective fields of study and research. • Identify, describe, and explain the function of various scientific instruments used in their respective field. • Demonstrate correct operation, calibration, and maintenance procedures for laboratory instruments, ensuring accuracy and reliability in their measurements. • Adhere to laboratory safety guidelines, use personal protective equipment (PPE) appropriately, and follow best practices to minimize risks and ensure a safe working environment.
			7.	**AECL101 :** Listening and Speaking Skills in English	• Students will be able to identify, comprehend, and interpret main ideas and supporting details in spoken English across different contexts using active and critical listening strategies. • Students will demonstrate correct pronunciation, stress, and intonation in

					spoken English, showing increased fluency and confidence in both academic and social interactions. • Students will be able to initiate and sustain basic conversations using polite expressions, greetings, and small talk appropriate to different situations. • Students will engage effectively in extended conversations in formal and informal contexts, using cohesive devices and demonstrating good interactional competence and turn-taking skills. • Students will participate constructively in group discussions, express opinions logically and respectfully, and respond persuasively to others' viewpoints. • Students will perform effectively in interviews, applying suitable verbal and non-verbal communication techniques with confidence and professional self-presentation. • Students will communicate accurately and courteously over the telephone, demonstrating clarity, appropriate etiquette, and the ability to handle both formal and informal telephonic interaction.
			8.	**VECD101:** Introduction to the Constitution of India	• Understand the philosophy, structure, and values of the Constitution of India. • Gain awareness about Fundamental Rights, Fundamental Duties, and Directive Principles of State Policy. • Understand the role and functioning of constitutional institutions such as Parliament, Executive, and the Judiciary. • Understand Citizenship, Democracy, and the Rule of Law. • Develop the capacity to critically analyze constitutional provisions and contemporary political issues.
			9.	**IKSK101** भारतीय ज्ञान परंपरा – कला आणि प्राचीन भारतीय भाषा	To be Updated
				IKSK102 भारतीय ज्ञान परंपरा – सामाजिक शास्त्रे	To be Updated
				IKSK103 भारतीय ज्ञान परंपरा – आरोग्य शास्त्र	To be Updated
				IKSK104 भारतीय ज्ञान परंपरा	To be Updated

			– विज्ञान आणि तंत्रज्ञान	
			IKSK105 Indian Knowledge System – Generic	To be Updated
		10.	**CCRX101 :** Health and Wellness-I	To be Updated
			CCRX102 : Yoga Education-I	To be Updated
			CCRX103 : Sports and Fitness-I	To be Updated
			CCRX104 : Cultural Activities-I	To be Updated
			CCRX105 : NSS-I	To be Updated
			CCRX106 : Fine/Applied/Visual/Performing Arts-I	To be Updated
			Semester II	
		1.	**PHYC103:** Electricity & Magnetism	• Understand Electric Field and Potential, Evaluation of Electric Field and Potential for different types of charge distributions. • Analyse the behaviour of electric and magnetic fields in matter, with a focus on polarizability, magnetization, and the electric displacement vector • Understand different aspects of alternating currents and its applications. • Explain the concepts of Magnetostatics, Lorentz Force and Energy stored in magnetic Field. • Comprehend the principles of electromagnetic induction and its applications.
		2.	**PHYC104:** Lab Activities on PHYC103	• Measure and analyse various magnetic properties, including the reduction factor of a tangent galvanometer and the horizontal component of Earth's magnetic field. • Investigate the behaviour of magnetic fields, including their variation with distance from a current-carrying coil and the magnetic dipole moment of a bar magnet. • Demonstrate principles of electrostatics, including charge accumulation, through hands-on experiments with a Van de Graaff generator. • Examine the characteristics of electrical circuits by studying L-R circuits and calculating the inductance and reactance of coils at specific frequencies.

					• Explore the effects of temperature on resistance and analyse the magnetic susceptibility of solutions, connecting these concepts to practical applications in physics and engineering. • Attain precision and accuracy in measurements through hands-on laboratory experiments.
			3.	**PHYM101:** Basics of Electricity & Magnetism (For other Discipline)	• Demonstrate an in-depth understanding of the core concepts of electricity and magnetism and their interdependence. • Apply theoretical principles to real-world problems and understand the operation of electrical and magnetic devices. • Explain electromagnetic phenomena and their applications. • Cultivate an aptitude for continuous learning and innovation in the field of electricity and magnetism.
			4.	**PHYE103:** Renewable Energy for Daily life (Offer For other faculty)	• Understand and explain the working principles of various renewable energy systems and their application in daily life. • Evaluate the feasibility of implementing renewable energy technologies in homes, communities, and industries by considering efficiency, cost, and environmental impact. • Use the principles of physics to analyse and optimize the performance of solar, wind, geothermal, and bioenergy systems. • Propose sustainable energy solutions and strategies for reducing reliance on non-renewable resources in day-to-day activities.
			5.	**PHYE104:** Energy Audit (Offer For other faculty)	• Demonstrate the ability to conduct preliminary and detailed energy audits in residential, commercial, and industrial settings. • Analyse energy consumption data, identify inefficiencies, and make data-driven recommendations for energy conservation. • Identify and prioritize energy-saving opportunities through the application of energy-efficient technologies, equipment upgrades, and behavioural changes. • Prepare detailed energy audit reports outlining findings, recommendations, and cost-benefit analyses for energy conservation measures (ECMs).
			6.	**PHYV102:** Solar Panel System	• Identify various photovoltaic system types and their uses. • Understand the function and importance of inverters and monitoring systems. • Design solar installations that prioritize

					efficiency and safety. • Prioritize quality control and safety during installations.
			7.	**SECS102:** MS–Excel with AI	• Effectively use basic Excel functions and features to perform data analysis and manipulation tasks. • Create various types of charts and visualizations in Excel and interpret them to extract meaningful insights • Use Excel's statistical tools to perform and interpret basic statistical analyses. • Leverage AI-powered features in Excel to gain insights and enhance their data analysis capabilities. • Use Power Query to import, clean, and transform data from various sources efficiently. • Create and use macros to automate repetitive tasks, improving efficiency in Excel.
			8.	**AECL102:** Reading and Writing Skills in English	• Demonstrate an expanded vocabulary and apply appropriate word choices in reading and writing contexts, and comprehend, interpret, and analyse different types of texts with accuracy and critical understanding. • Employ suitable reading strategies to achieve specific objectives such as skimming, scanning, and intensive reading, and read efficiently with improved speed and retention, adjusting pace according to text difficulty, and interpret data and information effectively from tables, charts, diagrams, and graphs. • Construct grammatically correct and meaningful sentences using appropriate structures and transformations, and write coherent and well-organized paragraphs and essays with logical development of ideas. • Compose formal and informal letters using appropriate tone, format, and style, and prepare structured and concise reports for academic and professional purposes, and write effective and context-appropriate emails and social media messages using clarity and digital etiquette. Integrate reading and writing skills to express ideas logically, persuasively, and accurately across contexts
			9.	**VECD102** Environmental Education	• Analyze historical, cultural, and industrial impacts on the environment, and explain the evolution of sustainability. • Distinguish between environmental issues at different spatial and temporal scales and

				evaluate pollution types and impacts. • Interpret pollution data and health standards, and assess pollution-related health risks. • Apply principles of environmental management and sustainability tools in real-world situations for decision-making and policy assessment
		10.	**CCRX107 :** Health and Wellness-II	To be Updated
			CCRX108 : Yoga Education-II	To be Updated
			CCRX109 : Sports and Fitness-II	To be Updated
			CCRX110 : Cultural Activities-II	To be Updated
			CCRX111 : NSS-II	To be Updated
			CCRX112 : Fine/Applied/Visual/Performing Arts-II	To be Updated
		Semester III		
		1.	**PHYC201:** Thermodynamics & Statistical Mechanics	• Understand Thermodynamics Laws and concept of Entropy. • Understand the physical significance of thermodynamical potentials. • Comprehend the kinetic model of gases w.r.t. various gas laws. • Study the implementations and limitations of fundamental radiation. • Explain various concepts used in statistical mechanics and quantum statistics • Enhance the understanding of thermodynamic behaviour and quantum phenomena.
		2.	**PHYC202:** Ancient Indian Physics	• Demonstrate a comprehensive understanding of ancient Indian physics, its historical context, and its significance. • Analyze and interpret key concepts and principles in classical mechanics, astronomy, optics, acoustics, thermodynamics, electricity, magnetism, metaphysics, and cosmology as they existed in ancient India. • Apply knowledge gained from ancient Indian physics to critically evaluate its impact on contemporary science and philosophy. • Engage in scholarly discussions and debates regarding the historical, cultural, and

					philosophical aspects of ancient Indian physics. • Appreciate the broader cultural and historical context in which scientific ideas in ancient India developed and evolved.
		3.	**PHYC203:** Lab Activities on PHYC201	• Demonstrate practical laboratory skills and theoretical understanding of heat transfer, thermal conductivity, and thermodynamics laws. • Foster analytical and critical thinking through data collection, interpretation, and application in thermal physics experiments.
		4.	**PHYM201:** Thermal Physics (For other Discipline)	• Explain the kinetic model of gases w.r.t. various gas laws. • Understand First and Second Law of Thermodynamics • Understand Concept of Entropy and physical significance of thermodynamical potentials. • Apply laws of thermodynamics and their implications in natural processes.
		5	**PHYM202:** Lab Activities on PHYM201 (For other Discipline)	• Develop practical laboratory skills in thermal physics and heat transfer. • Enhance theoretical understanding of thermal physics principles through hands-on experiments and data interpretation. • Foster critical thinking and problem-solving abilities in analysing thermal properties and behaviours of materials.
		6.	**PHYE201:** Physics of Sound & Music (Offer For other faculty)	• Explain the nature of sound, its properties, and how it travels through different media. • Differentiate between various types of sound such as loud and soft, high and low-pitched, and natural versus artificial sounds. • Apply the concepts of sound waves, reflection, and resonance in real-life scenarios, such as identifying echoes and understanding their practical uses. • Develop an appreciation for how music is created and enhanced using the principles of physics.
		7.	**PHYV201:** Electrical Circuit and Network Skills	• Solve electrical circuits and verify experimental results through theoretical calculations. • Implement Circuit Theorems such as Thevenin's, Norton's, and Superposition in real-world circuits to simplify and solve complex electrical networks. • Calculate total resistance, current, and voltage distribution in both DC and AC systems. • Demonstrate Transformer Principles by performing practical experiments to study voltage transformations and efficiency in transformers.
		8.	**AECL201:** श्रवण	To be Updated

				आणि संभाषण कौशल्ये	
			9.	**PHYF204:** Field Project	• Participate in the projects in industries during his or her industrial training. • Describe use of advanced tools and techniques encountered during industrial training and visit. • Interact with industrial personnel and follow the practices and discipline prescribed in industry or field. • Develop awareness about general workplace behavior and build interpersonal and team skills. • Prepare professional work reports and presentations.
			10.	**CCRX201 :** Health and Wellness-III	To be Updated
				CCRX202 : Yoga Education-III	To be Updated
				CCRX203: Sports and Fitness-III	To be Updated
				CCRX204 : Cultural Activities-III	To be Updated
				CCRX205 : NSS-III	To be Updated
				CCRX206 : Fine/Applied/Visual/Performing Arts-III	To be Updated
				Semester IV	
			1.	**PHYC205:** Wave Motion & Optics	• Explain how sound waves propagate through various mediums and understand the factors that affect the speed of sound. • Apply wave principles to solve problems involving wave behavior, interference, and diffraction. • Quantify sound intensity using decibels, and understand its significance in terms of perceived loudness and potential hearing damage. • Apply the laws of reflection and refraction to predict the behavior of light when it encounters different optical surfaces. • Analyze the behavior of lenses using the lens equation and thin lens formula to determine image characteristics. • Explain how optical instruments work, including the principles of image formation, magnification, and resolving power.

					• Describe the concepts of interference and diffraction, and understand how they give rise to characteristic patterns. • Critically evaluate and analyse optical phenomena, making connections between theoretical concepts and real-world applications.
			2.	**PHYC206:** Basics of Mathematical Methods in Physics	• Apply different mathematical methods to solve problems in various areas of physics, including mechanics, electromagnetism, quantum mechanics, and statistical mechanics. • Interpret and analyze numerical results and draw meaningful conclusions. • Develop a proactive and inquisitive approach towards learning and problem-solving. • Development of strong mathematical skills essential for success in the Physics Programme.
			3.	**PHYC207:** Lab Activities on PHYC205	• Apply the laws of reflection and refraction to predict the behavior of light when it encounters different optical surfaces. • Analyze the behavior of lenses using the lens equation and thin lens formula to determine image characteristics. • Explain how optical instruments work, including the principles of image formation, magnification, and resolving power. • Quantify sound intensity using decibels, and understand its significance in terms of perceived loudness and potential hearing damage. • Interpret the waveforms produced by different sound sources, explaining how various musical instruments and devices generate sound.
			4.	**PHYM203:** Oscillations & Optics (For other Discipline)	• Explain how sound waves propagate through various mediums and understand the factors that affect the speed of sound. • Apply the laws of reflection and refraction to predict the behavior of light when it encounters different optical surfaces. • Critically evaluate and analyse optical phenomena, making connections between theoretical concepts and real-world
			5.	**PHYM204:** Lab Activities On PHYM203 (For other Discipline)	• Explain how sound waves propagate through various mediums and understand the factors that affect the speed of sound. • Apply the laws of reflection and refraction to predict the behavior of light when it encounters different optical surfaces. • Apply optical principles to measure and analyze light properties • Critically evaluate and analyse optical

					phenomena, making connections between theoretical concepts and real-world applications.
		6.	**PHYE202:** Physics In Sports (Offer For other faculty)		• Demonstrate a comprehensive understanding of how fundamental physics principles like force, energy, and motion are applied in various sports activities. • Analyse and explain the motion of athletes and sports objects using kinematic equations, Newton's laws of motion, and energy principles. • Apply concepts of work, power, momentum, and rotational dynamics to suggest ways to optimize performance in sports like gymnastics, cycling, and athletics. • Understand and explain the effects of air resistance, drag, lift, and the Magnus effect in sports involving balls, swimming, and cycling.
		7.	**SECS201:** Intellectual Property Rights		• Understand the Concept of IPR and different Kinds of IPR • Know the procedure for application of various IPs • Understand infringement and remedies available • Know various issues relating to protection of IPR in Digital Age
		8.	**AECL201:** वाचन आणि लेखन कौशल्ये		To be Updated
		9.	**PHYG208:** Awareness of Sustainable Development Goals-I		To be Updated
		10.	**CCRX207 :** Health and Wellness-IV		To be Updated
			CCRX208 : Yoga Education-IV		To be Updated
			CCRX209: Sports and Fitness- IV		To be Updated
			CCRX210 : Cultural Activities- IV		To be Updated
			CCRX211 : NSS- IV		To be Updated
			CCRX212 : Fine/Applied/Vis		To be Updated

				ual/Performing Arts- IV	
				Semester V	
			1.	**PHYC301:** Classical & Quantum Mechanics	• Understand the mechanics of system of particles, D'Alembert's principle, Lagrangian mechanics, & Euler's equation of motion. • Understand about Hamiltonian formulation, Hamilton's Equations of Motion and Principle of least action. • Explain Canonical Transformations & Hamilton-Jacobi theory. • Describe about Rigid body dynamics including problems. • Understand the two body central force problem and its related aspects. • Understand the concepts of symmetries, conservation laws, bosons and fermions in quantum mechanics • Apply symmetries and conservation laws in various quantum mechanical problems
			2.	**PHYC302:** Solid State Physics	• Identify various crystal structures and their symmetries in solids and learn the basic concepts of X-ray diffraction, rotating crystal, and Laue methods. • Understand the theories and phenomena of lattice dynamics, and various bonding in solids. • Explain the dielectric phenomenon in crystals with their exciting properties and learn the basics of ferroelectric crystals. • Illustrate some exciting phenomena such as Meissner effect, Isotope effect, London's equations, and BCS theory of superconductors. • Understand the basics of high temperature superconductors and commercial applications of superconductors
			3.	**PHYC303:** Lab Activities on PHYC301 & PHYC302	• Understand the concepts of symmetries, conservation laws, bosons and fermions in quantum mechanics • Apply symmetries and conservation laws in various quantum mechanical problems • Identify various crystal structures and their symmetries in solids and learn the basic concepts of X-ray diffraction, rotating crystal, and Laue methods. • Understand the theories and phenomena of lattice dynamics, and various bonding in solids • Explain the dielectric phenomenon in crystals with their exciting properties and learn the basics of ferroelectric crystals. • Illustrate some exciting phenomena such as Meissner effect, Isotope effect, London's equations, and BCS theory of superconductors.

					• Understand the basics of high temperature superconductors and commercial applications of superconductors.
			4.	**PHYC304:** Fundamentals of Astronomy & Astrophysics	• Comprehend astronomical scales and understand basic concepts of positional astronomy like astronomical coordinate system and measurement of distances, time and temperature and radius of star. • Understand basic parameters of stars like brightness, radiant flux, luminosity, magnitude, orbits, spectral classification. H-R diagram. • Understand astronomical techniques, various types of optical telescopes and telescope mountings. Various types of detectors and their use with telescopes. • Understand Physics of sun and solar system: photosphere, chromosphere, corona, solar activity. Solar MHD, helioseismology, solar system and its origin. Nebular model. • Understand role of gravitation in astro-Physics, Newton vs Einstein, viral theorem and thermodynamic equilibrium. Atomic spectra, stellar spectra. • Classify stars by spectrum, luminosity, and temperature. • Understand galaxy structure, including the Milky Way and its components. • Explore star clusters and the galactic nucleus properties.
			5.	**PHYC305:** Semiconductor Technology	• Analyse, design, and implement simple electronic circuits using semiconductor devices. • Capable of selecting appropriate semiconductor materials based on specific application requirements. • Aware of the latest trends in semiconductor technology, including nanotechnology and quantum computing. • Design and analyse circuits incorporating optoelectronic devices for specific applications. • Choose appropriate semiconductor memory devices for different computing applications.
			6.	**PHYC306:** Electronics	• Analyse and design electronic circuits using techniques. • Explain power semiconductor devices, converters, inverters, and voltage regulation techniques for efficient power management and distribution. • Develop skills in diagnosing and rectifying faults in electronic circuits and systems • Collaborate effectively within a team on

					electronics projects and communicate technical concepts clearly to peers and stakeholders. • Apply analytical and critical thinking skills to solve complex electronics-related problems and make informed design decisions. • Develop a mindset for continuous learning and staying updated with advancements in electronics technology.
			7.	**PHYM301:** Computational Physics (For other Discipline)	• Apply numerical techniques such as solving algebraic and transcendental equations, differentiation, and integration to various physics problems. • Use interpolation methods and curve fitting to interpret and model experimental and theoretical data. • Solve ordinary and partial differential equations using numerical techniques and apply these solutions to physical problems like harmonic motion, wave propagation, and heat conduction.
			8.	**PHYM302:** Lab Activities On PHYM301 (For other Discipline)	• Apply numerical techniques such as solving algebraic and transcendental equations, differentiation, and integration to various physics problems. • Use interpolation methods and curve fitting to interpret and model experimental and theoretical data. • Solve ordinary and partial differential equations using numerical techniques and apply these solutions to physical problems like harmonic motion, wave propagation, and heat conduction
			9.	**PHYV301:** Lab Activities on Basic Electronics Devices	• Construct and analyse basic electronic circuits, demonstrating practical skills in circuit assembly and design. • Analyse the V-I characteristics of diodes and transistors, understanding their operating regions and behaviour. • Explore advanced electronic devices and understand their applications in modern electronics. • Demonstrate the ability to minimize and implement digital logical operations effectively.
			10.	**PHYF307:** Field Project	• Participate in the projects in industries during his or her industrial training. • Describe use of advanced tools and techniques encountered during industrial training and visit. • Interact with industrial personnel and follow

					engineering practices and discipline prescribed in industry. • Develop awareness about general workplace behaviour and build interpersonal and team skills. • Prepare professional work reports and presentations.
			11	**PHYG308:** Awareness of Sustainable Development Goals- II	To be Updated
				Semester VI	
			1.	**PHYC309:** Nuclear Physics & Radiation Safety	• Understand the hazards of radiation and the safety measures to guard against these hazards. • Revise or learn the basic aspects of the atomic and nuclear Physics, especially the radiations that originate from the atom and the nucleus. • Have a comprehensive knowledge about the nature of interaction of matter with radiations like gamma, beta, alpha rays, neutrons etc. and radiation shielding by appropriate materials. • Know about the units of radiations and their safety limits, the devises to detect and measure radiation, such as the Geiger-Mueller counter and scintillation counter.
			2.	**PHYC310:** Electromagnetic Theory	• Apply Maxwell's equations to deduce wave equation, electromagnetic field energy, momentum and angular momentum density. • Understand the laws of reflection and refraction and to calculate the reflection and transmission coefficients at plane interface in bounded media. • Understand the linear, circular and elliptical polarization of EM waves. Production as well as detection of waves in the laboratory. • Explore the concept of optical fibers and waveguides.
			3.	**PHYC311:** Lab Activities on PHYC309 & PHYC310	• Explore the basic aspects of the atomic and nuclear Physics, especially the radiations that originate from the atom and the nucleus. • Acquire in-depth knowledge of how matter interacts with various types of radiation, including gamma, beta, alpha rays, and neutrons, as well as the principles of radiation shielding using suitable materials. • Know about the units of radiations and their safety limits, the devises to detect and

					measure radiation, such as the Geiger-Mueller counter and scintillation counter. • Apply Maxwell's equations to deduce wave equation, electromagnetic field energy, momentum and angular momentum density. • Understand the laws of reflection and refraction and to calculate the reflection and transmission coefficients at plane interface in bounded media. • Understand the linear, circular and elliptical polarization of EM waves. Production as well as detection of waves in the laboratory. • Explore the concept of optical fibers and waveguides.
			4.	**PHYC312:** Instrumentation	• Explain the basic concepts and significance of mechanical, electrical, and electronic measurements in scientific and industrial contexts. • Recognize various types of measurement errors and apply suitable calibration techniques to enhance the accuracy and reliability of measurement instruments. • Accurately analyse and interpret data obtained from various measurement systems, applying it to practical situations such as process control and quality assurance. • Assess the performance and limitations of different measurement instruments, proposing improvements and adaptations based on emerging technological advancements.
			5.	**PHYC313:** Energy Storage Devices	• Apply acquired knowledge to real-world scenarios, identifying suitable energy storage solutions for specific applications. • Evaluate and compare different energy storage technologies based on their performance metrics, advantages, and limitations. • Analyze the environmental and economic impacts of energy storage devices, considering life cycle assessments and economic factors. • Recognize the role of energy storage in promoting sustainable practices and contribute to discussions on ethical considerations in the field
			6.	**PHYC314:** Embedded System	• Analyse the functioning of the 89C51's key features such as I/O ports, timers, interrupts, and serial communication. • Successfully interface sensors, actuators, and external devices with the 89C51 microcontroller.

					• Apply embedded systems knowledge to develop physics-related projects. • Analyze and optimize the performance of embedded systems.
			7.	**PHYM303:** Basics of Instrumentation (For other Discipline)	• Explain the basic concepts and significance of mechanical, electrical, and electronic measurements in scientific and industrial contexts. • Recognize various types of measurement errors and apply suitable calibration techniques to enhance the accuracy and reliability of measurement instruments. • Accurately analyze and interpret data obtained from various measurement systems, applying it to practical situations such as process control and quality assurance. • Assess the performance and limitations of different measurement instruments, proposing improvements and adaptations based on emerging technological advancements.
			8.	**PHYM304:** Lab Activities On PHYM303 (For other Discipline)	• Explain the basic concepts and significance of mechanical, electrical, and electronic measurements in scientific and industrial contexts. • Recognize various types of measurement errors and apply suitable calibration techniques to enhance the accuracy and reliability of measurement instruments. • Accurately analyze and interpret data obtained from various measurement systems, applying it to practical situations such as process control and quality assurance. • Assess the performance and limitations of different measurement instruments, proposing improvements and adaptations based on emerging technological advancements.
			9.	**PHYO315:** On-Job Training	• Demonstrate proficiency in applying theoretical knowledge and academic concepts to real-world professional situations. • Possess job-specific skills that are relevant to their chosen field of study, enabling them to perform tasks and responsibilities effectively and efficiently. • Acquire a comprehensive understanding of industry practices, trends, and challenges, contributing to their overall knowledge and expertise in the field. • Establish professional networks and relationships, expanding their professional

					connections and opportunities for future collaborations and career advancement. • Develop problem-solving and critical thinking abilities, demonstrating the ability to analyse complex situations, make informed decisions, and propose effective solutions. • Demonstrate professionalism, adaptability, and effective communication skills in a professional work environment.
			Semester VII		
			1.	**PHYC401:** Classical Mechanics	• Describe the laws governing the motion of a system of particles. • Define Lagrange's equations of motion. • Explain the role played by Hamilton's principle in classical mechanics. • Explain the function Routhian like the Lagrangian and the Hamiltonian. • Describe the role of canonical transformations in Hamitonian mechanics. • Clarify the rotations in a plane and space. • Understand variational principles to real physical problems
			2.	**PHYC402:** Electronic Devices	• Explain structure and working principles of few important analog and digital electronics devices. • Explain the characteristics, working principle and applications of Timer IC, VCO, and PLL. • Characterized the types of Power Supply, ADC, DAC and Logic Families
			3.	**PHYC403:** Mathematical Methods in Physics	• Understand the basic concepts of mathematics required to solve complex problems in physics. • Explain linear ODEs with constant coefficients. • Apply the concept of Fourier transform in Physics.
			4.	**PHYC404:** Physics - I	• Explain a concept used in electronic devices and circuits. • Gain a hands on experience working with real time circuits, to translate theory into practice. • Design, Test and verify the operation of simple circuits.
			5.	**PHYR405:** Research Methodology	• Understand some basic concepts of research and its methodologies. • Select proper method of Data collection & representation. • Select and apply appropriate statistical method for data analysis. • Perform literature review, research writings with the knowledge of Intellectual Property Rights.

				• Identify and address ethical considerations in research, ensuring the protection of participants and data integrity
		6.	**PHYC406:** Experimental Techniques in Physics	• Understand the important concepts and methods in experimental techniques. • Explain the working principles of the various techniques in experimental Physics. • Analyze the most commonly employed Characterization techniques used in Physics.
		7.	**PHYC407:** Physics of LASERs	• Describe the concept of stimulated emission and what is an active medium. • Describe the different types of lasers, its principle, and properties of laser beam and significance of the Lasers materials. • Understand Laser Physics, and Laser devices to analyze and quantify complex problems in the field of nanotechnology
		Semester VIII		
		1.	**PHYC409:** Atomic & Molecular Physics	• Explain the change in behavior of atoms in external applied electric and magnetic field. • Correlate rotational, vibrational, electronic and rotation-vibration spectra of molecules. • Understand the interaction of atoms in strong and weak magnetic field. • Characterized a broad knowledge of the most important concept of atoms and molecules. • Understand different spectroscopic techniques and their significance
		2.	**PHYC410:** Electrodynamics	• Understand the concepts of electrodynamics and Maxwell equations and their applications in various situations. • Understand concepts in electric field and scalar potential, magnetic field and vector potential. • Identify electromagnetic potentials, gauge transformations and Lorentz transformations. • Inhomogeneous wave equations and their significance. • Understanding the electrodynamics to create a scientific temperament.
		3.	**PHYC411:** Quantum Mechanics -I	• Explore the basic concepts of quantum Mechanics. • Solve special functions and matrices for solving Quantum Mechanical Problems. • Understand various quantum mechanical features by solving various potentials: example, Finite and infinite well, Harmonic oscillator. • Apply the time – dependent and time – independent Schrödinge's equations.

					• Apply the knowledge of Variational Methods for particle in box, Harmonic oscillator and Delta Function along with WKB approximation for classical Region and Tunneling.
			4.	**PHYC412:** Physics II – Practical (Computational Methods using 'C')	• Use numerical methods in solving problems in Physics. • Develop logics which will help to programme with the C high-level language. • Analyze data using computational methods. • Identify modern programming methods and describe the extent and limitations of computational methods in Physics.
			5.	**PHYC415:** Fundamentals of Material Science	• Explain importance of materials in materials science and engineering field. • Classify materials according to their types. • Describe basic definition and conception of materials and physical properties of materials.
			6.	**PHYC416:** Medical Physics	• Apply expert theoretical knowledge and an integrated understanding across all areas of medical physics. • Utilize advanced problem-solving skills to analyze outputs and synthesize complex information in applying medical physics knowledge into clinical practice. • Apply advanced theoretical and technical skills to perform and critically evaluate quality assurance procedures for medical physics. • Demonstrate an expert understanding of the roles and responsibilities of medical physicists in patient care and public safety, as part of diverse interdisciplinary teams. • Interpret the significance and scope of ethical principles and the application of these principles in medical physics.
			7.	**PHYO413:** On Job Training	• Demonstrate proficiency in applying theoretical knowledge and academic concepts to real-world professional situations. • Achieve job-specific skills that are relevant to their chosen field of study, enabling them to perform tasks and responsibilities effectively and efficiently. • Acquire a comprehensive understanding of industry practices, trends, and challenges, contributing to their overall knowledge and expertise in the field. • Develop problem-solving and critical thinking abilities, demonstrating the ability to analyze complex situations, make informed decisions, and propose effective solutions.

				• Demonstrate professionalism, adaptability, and effective communication skills in a professional work environment.

Appendix III

EVALUATION PATTERN

[CA and EE Evaluation Pattern as per the Minutes of the Meeting of the NEP Cell Dated 21.11.2023 and subsequent School Council Meetings]

SN	Type of Course	Continuous Assessment (CA)	End Examination (EE)
1	Theory (T) **4 Credit** 100 Marks CA: 30% EE: 70%	Each student is required to attempt total 02 (Two) "Continuous Assessments (CAs)" for each course of each Semester, as per the following details: 1. CA01: 'Continuous Assessment 01 (CA01)' on Credit 01 to Credit 04 of each course, consists of • 2 (Two) 'Short Answer Questions (SAQs)', each carrying 05 Marks, on Credit 01 and Credit 02 **and** • 1 (One) 'Long Answer Question (LAQ)' of 10 Marks, on Credit 03 and Credit 04. LAQ may consist of sub-questions. **CA01**: On Credit 01 to Credit 04, of Marks = (5x2 + 10) = **20 Marks** 2. CA02: 'Continuous Assessment 02 (CA02)' on Credit 01 to Credit 04 of each course, consists of • A test containing total **10** (Ten) 'Objective Type Questions, ' 05 (Five) on Credit 01 and Credit 02, and 05 (Five) on Credit 03 and Credit 04. Each 'Objective Type Question' of 1 Mark. **CA02**: On Credit 01 to Credit 04, of Marks = **10 Marks** 3. Maximum number of attempts for **CA**, during each semester: Single attempt only 4. **Total Marks**: **30** Marks	1. Student is required to answer **05 'VSAQs' out of 06 'VSAQs'**, each carrying 03 Marks, on Credit 01 to 04, for total 15 Marks. One VSAQ will be on each Credit. 2. Student is required to answer **05 'SAQs' out of 06 'SAQs'**, each carrying 05 Marks, on Credit 01 to 04, for total 25 Marks. One SAQ will be on each Credit. 3. Student is required to answer **01 'LAQ' out of 2 LAQs,** of 10 Marks on Credit 01 and Credit 02, for total 10 Marks. LAQ may consist of sub-questions. 4. Student is required to answer **01 'LAQ' out of 2 LAQs,** of 10 Marks on Credit 03 and Credit 04, for total 10 Marks. LAQ may consist of sub-questions. 5. Student is required to answer **01 'LAQ' out of 2 LAQs,** of 10 Marks on Credit 01 to Credit 04, for total 10 Marks. LAQ may consist of sub-questions. 6. Number of attempts: Till Valid Registration Period (VRP) only 7. Marks: 70 Marks 8. Duration: 150 minutes

<table>
<tr><th>SN</th><th>Type of Course</th><th colspan="2">Continuous Assessment (CA)</th><th>End Examination (EE)</th></tr>
<tr><td></td><td></td><td colspan="3"><table>
<tr><th>SN</th><th>Description</th><th>Evaluation of End Examination(EE)</th><th>Marks</th></tr>
<tr><td rowspan="3">1</td><td rowspan="3">Question Types</td><td>Very Short Answer Question (VSAQ) on each Credit</td><td>03 Marks</td></tr>
<tr><td>Short Answer Question (SAQ) on each Credit</td><td>05 Marks</td></tr>
<tr><td>On each Credit, either Single Long Answer Question (LAQ) or LAQ contains sub-questions (a), (b) and so on.</td><td>10 Marks</td></tr>
<tr><td>2</td><td>Grand Total Marks</td><td>Total five Questions in EE Question paper based on:
Credit 01 to 04 : 05 VSAQs out of 06 VSAQs (15 Marks)
Credit 01 to 04 : 05 SAQs out of 06 SAQs (25 Marks)
Credit 01 to 02 : 01 LAQ out of 02 LAQs (10 Marks)
Credit 03 to 04 : 01 LAQ out of 02 LAQs (10 Marks)
Credit 01 to 04 : 01 LAQ out of 02 LAQs (10 Marks)
LAQ may contains sub-questions</td><td>70 Marks</td></tr>
</table></td></tr>
<tr><td>2</td><td>Theory (T)
2 Credit
50 Marks

CA: 30%
EE: 70%</td><td colspan="2">Each student is required to attempt total 01 (One) “Continuous Assessment (CA)” for each course of each Semester, as per the following details:
1. CA01: 1 (One) ‘Continuous Assessment 01 (CA01)’ on Credit 01 and Credit 02 of each course, consists of
• 1 (One) ‘Short Answer Question (SAQ)’ of 5 Marks
and
• 1 (One) ‘Long Answer Question (LAQ)’of 10 Marks, LAQ may consist of sub-questions.
CA01: On Credit 01 and Credit 02, of Marks = (5 + 10) = 15 Marks
2. Maximum number of attempts for CA, during each semester: Single attempt only
3. Total Marks: 15 Marks</td><td>1. Student is required to answer 05 ‘VSAQs’ out of 06 ‘VSAQs’, each carrying 03 Marks, on Credit 01 to 02, for total 15 Marks. One VSAQ will be on each Credit.
2. Student is required to answer 02 ‘SAQs’ out of 03 ‘SAQs’, each carrying 05 Marks, on Credit 01 to 02, for total 10 Marks. One SAQ will be on each Credit.
3. Student is required to answer 01 ‘LAQ’ out of 2 LAQs, of 10 Marks on Credit 01 and Credit 02, for total 10 Marks. LAQ may consist of sub-questions.
4. Number of attempts: Till Valid Registration Period (VRP) only
5. Marks: 35 Marks
6. Duration: 75 minutes</td></tr>
</table>

<table>
<tr><th>SN</th><th>Type of Course</th><th colspan="2">Continuous Assessment (CA)</th><th>End Examination (EE)</th></tr>
<tr><td></td><td></td><td colspan="2"><table>
<tr><th>SN</th><th>Description</th><th>Evaluation of End Examination (EE)</th><th>Marks</th></tr>
<tr><td rowspan="3">1</td><td rowspan="3">Question Types</td><td>Very Short Answer Question (VSAQ) on each Credit</td><td>03 Marks</td></tr>
<tr><td>Short Answer Question (SAQ) on each Credit</td><td>05 Marks</td></tr>
<tr><td>On each Credit, either Single Long Answer Question (LAQ) or LAQ contains sub-questions (a), (b) and so on.</td><td>10 Marks</td></tr>
<tr><td>2</td><td>Grand Total Marks</td><td>Total three Questions in EE Question paper based on:
Credit 01 to 02 : 05 VSAQs out of 06 VSAQs (15 Marks)
Credit 01 to 02 : 02 SAQs out of 03 SAQs (10 Marks)
Credit 01 to 02 : 01 LAQ out of 02 LAQs (10 Marks)
LAQ may contains sub-questions</td><td>35 Marks</td></tr>
</table></td><td></td></tr>
<tr><td>3</td><td>Practical (P)

4 Credit
100 Marks

CA: 50%
EE: 50%</td><td colspan="2">1. Student is required to submit “Activity Report in Work-Book Format” for each Credit in the prescribed format.
2. Maximum number of attempts for each CA, during each semester : Single attempt only
3. Marks: 50 Marks
4. Grading criteria:
<table>
<tr><td>Lab Punctuality, Preparedness & Ethics</td><td>Irregular in lab. Copies the experiment from others
(0 Points)</td><td>Consistently regular but unable to explain the concepts
(06 Points)</td><td>Punctuality in lab. Follows the procedure and responds to questions asked
(10 Points)</td></tr>
<tr><td>Activity Report and Performance

(Experiment No, Date, Objectives, Apparatus with specification, Observations, Graphs, software used if any)</td><td>Poor Documentation and copied the experiment from others. Couldn't perform the Activity /poor observation made
(04 Points)</td><td>Average Documentation: Report is in format but some of the formatting guidelines are missed. Performed the Activity but observations made with some mistakes
(12 Points)</td><td>Good Documentation: Lab activity writing is in proper format with all references, Grammar. Performed the Activity on time observations made with no mistakes
(20 Points)</td></tr>
<tr><td>Results and Conclusion</td><td>Unable to achieve the desired results but makes attempts to relate data to theory. Poor concluding statements
(08 Points)</td><td>Average graphical and tabulated representation with misinterpret physical significance of theory. Achieve the desired results and but insufficient conclusion statement.
(14 Points)</td><td>Analyses and interpret observed data carefully with good graphical and tabulated representation using appropriate theory/evidence. Achieve the results and reach to appropriate Conclusion
(20 Points)</td></tr>
</table></td><td>External and internal examiners shall assess each student based on:
1. Workbook/Activity Report submission by the student (Only by External Examiner) [05 Marks]
2. Practical Activity performed by the student [12 Marks]
3. Result and Conclusion of the Practical Activity [13 Marks]
4. Viva-Voce on Practical Activities [20 Marks]
5. Number of attempts: Till Valid Registration Period (VRP) only
6. Marks: 50 Marks
7. Duration: 180 minutes</td></tr>
</table>

<table>
<tr><th>SN</th><th>Type of Course</th><th>Continuous Assessment (CA)</th><th>End Examination (EE)</th></tr>
<tr><td></td><td></td><td>
<table>
<tr><td rowspan="2">SN</td><td colspan="3">Evaluation of Practical End Examination</td></tr>
<tr><td>Description</td><td>Internal Examiner</td><td>External Examiner</td></tr>
<tr><td>1</td><td>Workbook/Activity Report</td><td>-</td><td>05 Marks</td></tr>
<tr><td>2</td><td>Actual Conduct of one randomly selected Practical Activity</td><td>02 Marks</td><td>10 Marks</td></tr>
<tr><td>3</td><td>Diagram, Synoptic Answers, Graph/Observation and Conclusion</td><td>03 Marks</td><td>10 Marks</td></tr>
<tr><td>4</td><td>Viva-Voce/Oral</td><td>05 Marks</td><td>15 Marks</td></tr>
<tr><td>5</td><td>Total</td><td>10 Marks</td><td>40 Marks</td></tr>
</table>
</td><td></td></tr>
<tr><td>4</td><td>Practical (P)

2 Credit
50 Marks

CA: 50%
EE: 50%</td><td>
1. Student is required to submit “Activity Report in Work-Book Format” for each Credit in the prescribed format.
2. Maximum number of attempts for each CA, during each semester : Single attempt only
3. Marks: 25 Marks
4. Grading criteria:
<table>
<tr><td>Lab Punctuality, Preparedness & Ethics</td><td>Irregular in lab. Copies the experiment from others
(0 Points)</td><td>Consistently regular but unable to explain the concepts
(06 Points)</td><td>Punctuality in lab. Follows the procedure and responds to questions asked
(10 Points)</td></tr>
<tr><td>Activity Report and Performance

(Experiment No, Date, Objectives, Apparatus with specification, Observations, Graphs, software used if any)</td><td>Poor Documentation and copied the experiment from others. Couldn't perform the Activity /poor observation made
(04 Points)</td><td>Average Documentation: Report is in format but some of the formatting guidelines are missed. Performed the Activity but observations made with some mistakes
(12 Points)</td><td>Good Documentation: Lab activity writing is in proper format with all references, Grammar. Performed the Activity on time observations made with no mistakes
(20 Points)</td></tr>
<tr><td>Results and Conclusion</td><td>Unable to achieve the desired results but makes attempts to relate data to theory. Poor concluding statements
(08 Points)</td><td>Average graphical and tabulated representation with misinterpret physical significance of theory. Achieve the desired results and but insufficient conclusion statement.
(14 Points)</td><td>Analyses and interpret observed data carefully with good graphical and tabulated representation using appropriate theory/evidence. Achieve the results and reach to appropriate Conclusion
(20 Points)</td></tr>
</table>
</td><td>
1. External and internal examiners shall assess each student based on:
a. Workbook/Activity Report submission by the student (Only by External Examiner) [05 Marks]
b. Practical Activity performed by the student [06 Marks]
c. Result and Conclusion of the Practical Activity[07 Marks]
d. Viva-Voce on Practical Activities [07 Marks]
2. Number of attempts: Till Valid Registration Period (VRP) only
3. Marks: 25 Marks
4. Duration: 180 minute
</td></tr>
</table>

<table>
<tr><th>SN</th><th>Type of Course</th><th>Continuous Assessment (CA)</th><th>End Examination (EE)</th></tr>
<tr><td></td><td></td><td>
<table>
<tr><td rowspan="2">SN</td><td colspan="3">Evaluation of Practical End Examination</td></tr>
<tr><td>Description</td><td>Internal Examiner</td><td>External Examiner</td></tr>
<tr><td>1</td><td>Workbook/Activity Report</td><td>-</td><td>05 Marks</td></tr>
<tr><td>2</td><td>Actual Conduct of one randomly selected Practical Activity</td><td>01 Marks</td><td>05 Marks</td></tr>
<tr><td>3</td><td>Diagram, Synoptic Answers, Graph/Observation and Conclusion</td><td>02 Marks</td><td>05 Marks</td></tr>
<tr><td>4</td><td>Viva-Voce/Oral</td><td>02 Marks</td><td>05 Marks</td></tr>
<tr><td></td><td>Total</td><td>05 Marks</td><td>20 Marks</td></tr>
</table>
</td><td></td></tr>
<tr><td>5</td><td>Term Work (TW)

2 Credit
50 Marks

CA: 50 %
EE: 50 %

For SEC & VSC courses</td><td>1. Student is required to submit “Activity Report in Work-Book Format” for each Credit in the prescribed format.
2. Maximum number of attempts for each CA, during each semester : Single attempt only
3. Marks: 25 Marks
4. Grading Criteria:
<table>
<tr><td>Lab Punctuality, Preparedness & Ethics</td><td>Irregular in lab. Copies the experiment from others
(0 Points)</td><td>Consistently regular but unable to explain the concepts
(03 Points)</td><td>Punctuality in lab. Follows the procedure and responds to questions asked
(05 Points)</td></tr>
<tr><td>Activity Report and Performance

(Experiment No, Date, Objectives, Apparatus with specification, Observations, Graphs, software used if any)</td><td>Poor Documentation and copied the experiment from others. Couldn't perform the Activity /poor observation made
(02 Points)</td><td>Average Documentation : Report is in format but some of the formatting guidelines are missed. Performed the Activity but observations made with some mistakes
(06 Points)</td><td>Good Documentation: Lab activity writing is in proper format with all references, Grammar. Performed the Activity on time observations made with no mistakes
(10 Points)</td></tr>
<tr><td>Results and Conclusion</td><td>Unable to achieve the desired results but makes attempts to relate data to theory. Poor concluding statements
(04 Points)</td><td>Average graphical and tabulated representation with misinterpret physical significance of theory. Achieve the desired results and but insufficient conclusion statement.
(07 Points)</td><td>Analyses and interpret observed data carefully with good graphical and tabulated representation using appropriate theory/evidence. Achieve the results and reach to appropriate Conclusion
(10 Points)</td></tr>
</table>
</td><td>1. External and internal examiners shall assess each student based on:
a. Workbook/Activity Report submission by the student (Only by External Examiner) [05 Marks]
b. Viva-Voce on Practical Activities [20 Marks]
2. Number of attempts: Till Valid Registration Period (VRP) only
3. Marks: 25 Marks
4. Duration: 180 minutes</td></tr>
</table>

<table>
<tr><th>SN</th><th>Type of Course</th><th>Continuous Assessment (CA)</th><th>End Examination (EE)</th></tr>
<tr><td></td><td></td><td>
<table>
<tr><td rowspan="2">SN</td><td colspan="3">Evaluation of Practical End Examination</td></tr>
<tr><td>Description</td><td>Internal Examiner</td><td>External Examiner</td></tr>
<tr><td>1</td><td>Workbook/Activity Report</td><td>-</td><td>05 Marks</td></tr>
<tr><td>2</td><td>Viva-Voce/Oral</td><td>05 Marks</td><td>15 Marks</td></tr>
<tr><td></td><td>Total</td><td>05 Marks</td><td>20 Marks</td></tr>
</table>
</td><td></td></tr>
<tr><td>6</td><td>Field Project (TW)

2 Credit
50 Marks

CA: 100%
EE: NA</td><td>Students need to complete Field Project (Total Study hours 60 hrs including Activity Report). After completion of the field project, learners shall submit a report to the LSC - Programme Coordinator (PC) and Mentor/Guide.
1. Maximum number of attempts for each CA, during each semester: Single attempt only
2. Duration: Minimum 15 days or 2 Weeks duration – Any month during the semester
3. Marks: 50 Marks
4. Grading Criteria for Evaluation of FP (only by Mentor/Guide):
<table>
<tr><td>SN</td><td>Description</td><td>Marks</td></tr>
<tr><td>1</td><td>Key Definitions of Problem area and analysis of preliminary data</td><td>10</td></tr>
<tr><td>2</td><td>Work related to formats, Correspondence, Interactions and liaising etc</td><td>05</td></tr>
<tr><td>3</td><td>Field work and data collection, Analysis</td><td>10</td></tr>
<tr><td>4</td><td>Feedback to community</td><td>05</td></tr>
<tr><td>5</td><td>Report submission</td><td>10</td></tr>
<tr><td>6</td><td>Viva-Voce /Oral</td><td>10</td></tr>
<tr><td colspan="2">Total</td><td>50</td></tr>
</table>
</td><td>End Examination is Not Applicable (NA)</td></tr>
</table>

<table>
<tr><th>SN</th><th>Type of Course</th><th>Continuous Assessment (CA)</th><th>End Examination (EE)</th></tr>
<tr><td>7</td><td>OJT or Internship (TW)

4 Credit
100 Marks

CA: 50%
EE: 50%</td><td>
1. Students need to complete one month On Job Training (OJT) or Internship (Total Study hours 120 hrs including Internship Report) in any Industry/Organization/Institute/ R&D Division /Any Micro/ Small/ Medium/ enterprise/Govt/NGO/PSU/Online Internship related to major course.
2. Maximum number of attempts for each CA, during each semester: Single attempt only
3. Marks: 50 Marks
4. Duration: 1 Month or 4 Weeks –
Any one month within semester duration, but before end examination of that particular semester
5. Grading Criteria for Evaluation of OJT (or Intern) only by Mentor where the Internship is proposed to be imparted:
<table>
<tr><th>SN</th><th>Parameters</th><th>Marks Out of</th></tr>
<tr><td>1</td><td>Behaviours, Shows interest in assigned work, Willingness to learn</td><td>10</td></tr>
<tr><td>2</td><td>Accepts responsibility, Cooperates with co-workers and supervisors, Demonstrates organizational skills</td><td>10</td></tr>
<tr><td>3</td><td>Uses time, knowledge and expertise effectively, Analyses problems effectively</td><td>10</td></tr>
<tr><td>4</td><td>Demonstrates creativity/ originality / any innovative contribution, Professional ethics and accountability</td><td>10</td></tr>
<tr><td>5</td><td>Writes effectively, Produces high quality work/Skill Proficiency</td><td>10</td></tr>
<tr><td colspan="2">Total</td><td>50</td></tr>
</table>
Document as Evidence: Activity report along with Certificate or Declaration, duly issued and signed by the concerned authority [To be assessed during EE] should be submitted during End Examination to the parent Learner support Centre (LSC).
</td><td>
At the end of second semester, Programme Coordinator (PC)/ Supervisor of LSC and 1 (one)External Examiner will complete ‘End Exam (EE)’ for all allotted students as follows:
1. Duration of EE: After Theory EE of second Semester
2. Programme Coordinator (PC)/ Supervisor of LSC and External Expert will have 20% and 80% weightage respectively in EE.
3. Number of attempts: Till Valid Registration Period (VRP) only
4. Marks for EE: 50 Marks
<table>
<tr><th>Parameter</th><th>PC /Supervisor of LSC</th><th>External Expert</th></tr>
<tr><td>Professional Attitude</td><td>-</td><td>05 Marks</td></tr>
<tr><td>Maintenance of Daily Diary</td><td>-</td><td>10 Marks</td></tr>
<tr><td>Internship Report</td><td>05 Marks</td><td>10 Marks</td></tr>
<tr><td>Viva/Oral</td><td>05 Marks</td><td>15 Marks</td></tr>
<tr><td>Total</td><td>10 Marks</td><td>40 Marks</td></tr>
</table>
</td></tr>
</table>

<table>
<tr><th>SN</th><th>Type of Course</th><th>Continuous Assessment (CA)</th><th>End Examination (EE)</th></tr>
<tr><td rowspan="2">8</td><td rowspan="2">CEP (TW)

2 Credit
50 Marks

CA: 100%
EE: NA</td><td>1. CEP Proposals*: 15 Marks
2. Planning community work, correspondence, formats, interactions, liaising: 10 Marks
3. CEP report**: 15 marks
4. Viva /Presentation: 10 Marks
Marks: 50 Marks</td><td>End Examination is Not Applicable (NA)</td></tr>
<tr><td colspan="2">*CEP Proposals: 1) Basic structure of Society
2) Key definitions of Problem area
3) Analysis of Preliminary data

**CEP Report: 1) Field work and data gathering
2) Analysis and reporting</td></tr>
</table>

Appendix – IV

Entry level qualification to B. Sc. (Honours) programmes

<table>
<tr><th>SN</th><th colspan="3">Academic Qualifications required for Eligibility</th></tr>
<tr><td rowspan="2">A)</td><td colspan="3">A candidate who has passed Standard 12th / (10+2)th / Level 4.0 examination conducted by Maharashtra State Board of Secondary and Higher Secondary Education/CBSE/ ISC/NIOS or equivalent examinations by any Other State or any other recognized Board with science subjects shall be eligible for admission to First Semester B. Sc. Programmes as per NEP 2020:</td></tr>
<tr><td colspan="2">Groups of Science subjects/courses from</td><td>Eligible for Any One Major in Science Discipline</td></tr>
<tr><td>1.</td><td colspan="2">1. English
2. Physics, Chemistry, Mathematics, Biology</td><td>Any One Major from: Physics, Chemistry, Mathematics, Botany, Zoology, Environmental Science</td></tr>
<tr><td>2.</td><td colspan="2">1. English
2. Physics, Chemistry, Mathematics</td><td>Any One Major from: Physics, Chemistry, Mathematics, Environmental Science</td></tr>
<tr><td>3.</td><td colspan="2">1. English
2. Physics, Chemistry, Biology</td><td>Any One Major from: Physics, Chemistry, Botany, Zoology, Environmental Science</td></tr>
<tr><td>4.</td><td colspan="2">1. English
2. Vocational Course of 200 Marks
3. Physics, Chemistry, Mathematics</td><td>Any One Major from: Physics, Chemistry, Mathematics, Environmental Science</td></tr>
<tr><td>5.</td><td colspan="2">1. English
2. Vocational Course of 200 Marks
3. Physics, Chemistry, Biology</td><td>Any One Major from: Physics, Chemistry, Botany, Zoology, Environmental Science</td></tr>
<tr><td rowspan="3">6.</td><td rowspan="3">1. English
2. Physics, Chemistry</td><td>3. Any one of the following Optional Course of 100 Marks:

Geography, Geology, Food Science and Technology, Agriculture Science and Technology, Animal Science and Technology, Defence Studies</td><td>Any One Major from: Physics, Chemistry, Environmental Science</td></tr>
<tr><td>3. Any one of the following Optional Course of 100 Marks:

Food Science and Technology, Agriculture Science</td><td>Major: Botany</td></tr>
<tr><td>3. Optional Course of 100 Marks: Animal Science and Technology</td><td>Major: Zoology</td></tr>
<tr><td colspan="4">OR</td></tr>
<tr><td rowspan="2">B)</td><td colspan="3">A candidate who has passed (10+3) years or (12+2) years Diploma from Maharashtra State Technical Board / a statutory or recognized board/ university in India</td></tr>
<tr><td colspan="2">Description</td><td>Eligible for Any One Major in Science Discipline</td></tr>
<tr><td>1.</td><td colspan="2">(10+3) years / (12+2) years Engineering Diploma</td><td>Any One Major from: Physics, Chemistry, Mathematics, Environmental Science</td></tr>
<tr><td colspan="4">OR</td></tr>
<tr><td rowspan="2">C)</td><td colspan="3">A candidate who has passed Higher Secondary School Certificate (10+2) Examination with English and any of the following +2 Level HSC Vocational (MCVC) Group</td></tr>
<tr><td colspan="2">HSC Vocational (MCVC) Group</td><td>Eligible for Any One Major in Science Discipline</td></tr>
<tr><td rowspan="2">1.</td><td rowspan="2">Agriculture Group or</td><td>Horticulture (KA, KB, KC)</td><td rowspan="2">Any One Major from:
Botany, Environmental Science</td></tr>
<tr><td>Crop Science (LA, LB, LC)</td></tr>
</table>

SN	Academic Qualifications required for Eligibility		
	Fisheries Group	Animal Husbandry and Dairy Technology (MA, MB, MC)	**Any One Major from:** Zoology, Environmental Science
		Fisheries Technology (NA, NB, NC)	
2.	Catering and Food Products Technology	Catering and Food Products Technology (SA, SB, SC)	**Any One Major from:** Botany, Zoology, Environmental Science
3.	Paramedical Group	Child, Old Age and Health care services (QA, QB, QC)	**Any One Major from:** Botany, Zoology, Environmental Science
		Medical Laboratory Technician (OA, OB, OC)	**Any One Major from:** **Physics**, Chemistry, Zoology
		Ophthalmic Technician (RA, RB, RC)	**Major: Physics**
		Radiology Technician (PA, PB, PC)	
4.	Technology Group	Electronics Technology (EA, EB, EC)	**Major: Physics**
		Electrical Technology (FA, FB, FC)	

END OF DOCUMENT

DEB-UGC application for Programme approval for AY 2025-26

School of Sciences, YCMOU Nashik

(Formerly School of Architecture, Science and Technology)

Programme Project Report (PPR)

UGV05: B.Sc. (Honours) (Zoology) {2025 Pattern}

A. Programme Project Report (PPR)

Name of Programme: 4 Year Bachelor of Science (Honours) (Zoology)		
a	Programme's mission & objectives	**Mission**: The "Bachelor of Science (Honours)" is an innovative programme based on a number of core, elective and skill courses in Zoology. Upon graduation, the learners will be able to understand and appreciate the impact of "Zoology" in day-to-day life. Further, the learners will be exposed to the current trends in research about "Zoology". The mission is to forge a solid foundation in Zoology, empowering learners to confidently tackle and analyze complex scientific challenges with ease. This program aims to transformative, holistic, and value-based immersive learning experiences to students field of Zoology. The program provides a comprehensive education in both theoretical and experimental Zoology. Learners will engage in hands-on laboratory activities and immersive field projects or internships, ensuring they acquire not only fundamental knowledge but also practical skills vital for success in the scientific community. **Objectives**: The main objectives for offering this programme, are • Access to Science Education: To provide science education opportunities through LEARNER Open and Distance Learning (ODL), making learning accessible and cost effective. • Deep Understanding: To ensure that learner gain a deep understanding of the fundamental principles and concepts in Zoology. • Problem-Solving Abilities: To equip learner with problem-solving skills, enabling them to apply scientific methodologies to address complex issues that require expertise in zoology discipline. • Laboratory Proficiency: To develop practical laboratory skills, enabling students to design experiments, collect data, and analyze results in Zoology. • Research Aptitude: To nurture research aptitude by encouraging students to engage in interdisciplinary research projects at the undergraduate level. • Effective Communication: To enhance communication skills, allowing students to communicate scientific findings effectively, both in writing and orally.

		• Flexibility and Adaptability: To prepare students for diverse career opportunities, including academia, research, industry, and entrepreneurship, by offering a versatile skill set. • Engage in life-long learning and will have recognition.
b	Relevance of the Programme with HEI's Mission and Goals	Objects of the YCMOU (as per the YCMOU Act) which would be fulfilled by implementing the proposed program (a) To provide through instruction, teaching and training and other educational opportunities, access to larger and larger segment of population, and to the disadvantaged groups such as those living in remote and rural areas including working people, housewives and other adults who wish to upgrade or acquire knowledge through studies in various fields; [1(a)] (b) To strengthen and diversify the degrees, diploma and certificate courses at various educational levels, to fulfill the knowledge, skills and development needs of the individuals, institutions and society in general, by relating, particularly, the courses, to the needs of the employment and economic development of the state on the basis of its natural and human resources; [1(b)] (c) To promote acquisition of knowledge in a rapidly developing and changing society and to continually offer opportunity of upgrading knowledge, training and skills in the context of innovations, research and discovery in all field of human endeavour by developing educational network with the use of modern communication media and technologies appropriate for a learning society; [1(c)] (d) To provide an innovative system of University level education, flexible and open, in regard to the methods and pace of learning, combination of courses, eligibility for enrolment, age of entry, conduct of examinations and operation of the program, with a review to promote learning and encourage excellence in all fields of knowledge; [1(d)] (e) To contribute to the improvement of the education system in the state by providing a non-formal channel complementary to the formal system and encouraging transfer of credits and exchange of teaching staff by making a wide use of text and other software developed by the University; [1(e)] (f) To develop innovative, need based Vocational courses and establish industry, institution linkage for developing the society; [1(f)] (g) To provide through incidental and non-formal means, for continuing and extension of education in various cultural forms, arts, crafts and skills of the country, raising their quality and improving their availability to the people; [1(g)] (h) To provide for the counseling and guidance to its learners; [1(j)] (i) To provide major part of its resources and direct efforts in designing, developing and offering need-based and relevant vocational courses. [1(l)]
c	Nature of prospective target group of learners	12th / (10+2)th / Level 4.0 examination conducted by Maharashtra State Board of Secondary and Higher Secondary Education/CBSE/ ISC/NIOS or equivalent examinations by any Other State or any other recognized Board with Science Subjects Pass, including English and Biology / (Physics, Chemistry & Optional Course) or Equivalent pass OR Higher Secondary School Certificate (10+2) Examination with English and any of the following +2 Level HSC Vocational (MCVC) Group Pass

		<table><tr><td>Animal Husbandry and Dairy Technology (MA, MB, MC)</td></tr><tr><td>Fisheries Technology (NA, NB, NC)</td></tr><tr><td>Catering and Food Products Technology (SA, SB, SC)</td></tr><tr><td>Child, Old Age and Health care services (QA, QB, QC)</td></tr><tr><td>Medical Laboratory Technician (OA, OB, OC)</td></tr></table> Although similar UG Programme are offered by conventional institutes, the conventional educational system offers very little freedom to learners as regards when, where, and how to learn. The proposed programme aims to provide this freedom to learners to the maximum possible extent.
d	Appropriateness of programme to be conducted in Open and Distance Learning mode to acquire specific skills and competence Specify the expected learning outcomes in terms of: 1. Knowledge Attainment: 2. Skills and Competencies: Compliances of academic, professional & occupational standards:	The proposed programme is designed in adherence to the principles of National Education Policy (NEP2020) to acquire knowledge and skills with valuable experiences through VSC, SEC, AEC, VEC, IKS, hands-on activities, projects, internships and much more. This aims to provide relevant skills as needed by the working professional to identify and solve challenging problems in Zoology, thus contributing to the ever-increasing demands of society and industry. The programme helps to develop scientific tempers and attitudes, which in turn can prove beneficial for society since scientific developments can make a nation or society grow at a rapid pace. After studying this programme, learners will be better equipped to learn and have a deep understanding of key zoology concepts, principles, and theories relevant to the field of zoology, are prepared to take on leadership roles in zoology, governmental agencies, research institutions, and industries related to zoology. This programme uses the Open and Distance (ODL) mode of education in compliance with the objective 'reach to unreach' by offering: Theory, Practical, Term-work, Field Project/OJT, courses. The teaching-learning component is offered as face-to-face counseling along with full practical and project-work activities by qualified and experienced teacher/ mentors/experts at a recognized Learner Support Center (LSC), along with continuous assessment, and offline materials and resources in printed book format or soft copy format. The UGC recently introduced a 'virtual laboratory' approach for practical courses. This university is currently working on implementing this for the proposed laboratory activities in science courses. Additionally, this programme adheres all the prevalent academic norms and standards of the UGC-DEB. Hence, this programme is appropriate to conduct in open and distance learning modes to provide an opportunity for those aspirants who cannot take traditional education but want to improve their existing science skills and/or to acquire specified skills and competencies.
e	Instructional Design **1.** Curriculum Design **(*Outcome of Expert Committee meeting; Program Structure:***	This B.Sc. (Honours) programme for undergraduates is well structured based on the NEP 2020 framework. The entire curriculum is well organized and thoughtfully designed, featuring an updated syllabus. The four-year B.Sc. (Honours) program consists of 176 credits distributed over eight semesters, with learners required to complete 22 credits in each semester. The modular structure of the curriculum allows for multiple entry and exit options. After successfully completion of 1 to 6 semesters, learners will be awarded a three-year Bachelor of Science (B.Sc.) degree with 132 credits. These credits will be distributed among Major Courses (DSC & DEC)), Minor courses, Open Electives (OEs), Ability Enhancement Courses (AEC), Skill Enhancement Courses (SEC), Value Education Courses (VEC), Indian

***specify the theory, practical, fieldwork, project, etc components*):**

2. Total Credit Points (*including course wise*):
3. Detailed Syllabi:
4. Duration of the program (***Minimum & Maximum*):**
5. Medium of Instruction:
6. Type of Program (***General/Technical/ Professional*):**
7. Faculty and Support Staff:
8. Instructional Design & Delivery Mechanism (***Media to be used -print, audio, video, online, computer aided, web based, etc. (course wise)*):**

Student Support Service System (***Specify the provisions to be made at Head Quarter, Regional Centers, Learner Support Centers and Web based, etc*):**

Knowledge System (IKS), On Job Training (OJT), Field projects (FP), Co-curricular Courses (CC), Research Methodology (RM) etc.
Among all offered courses, learners have to opt the courses as per NEP2020 guidelines.

Semester pattern: This programme is of total 8 semesters.
Distribution of the credits are as follows:

Sem	Mandatory Courses (DSC)				Elective Courses (DSE) (4 CR)	Minor Courses (2CR)		Open Elective OE (2CR)	VSC, SEC (VSEC) (2CR)		AEC, VEC, IKS (2CR)		OJT, FP, CEP, CC (2/4 CR)	Total Courses (CR)
	Theory (T)		Practical (P)											
	4 CR	2 CR	4 CR	2 CR		T	P	T	T	TW/P	2CR (T)		TW	
I	1	-	-	1	-	-	-	2	-	2	3	-	CC (2CR)	10 (22 CR
II	1	-	-	1	-	1	-	2	-	2	2	-	CC (2CR)	10 (22 CR
Cum Cr.	12				00	02		08	08		10		04	44
Exit option: Award of UG Certificate in Faculty of Science-Zoology (Level 4.5) with 44 credits and an additional 4 credits core NSQF course/ Internship OR Continue with Major and Minor														
III	1	1	-	1	-	1	1	1	-	1	1 (2CR)		FP (2CR) CC (2CR)	10 (22 CR
IV	1	1	-	1	-	1	1	1	1	-	1 (2CR)		CEP (2CR) CC (2CR)	10 (22 CR
Cum Cr.	28				00	10		12	12		14		12	88
Exit option: Award of UG Diploma in Faculty of Science-Zoology (Level 5.0) with 88 credits and an additional 4 credits core NSQF course/ Internship OR Continue with Major and Minor														
V	1	1	1	-	1	1	1	-	-	1	-		FP/ CEP (2CR)	8 (22 CR
VI	1	1	1	-	1	1	1	-	-	-	-		OJT (4CR)	7 (22 CR
Cum Cr.	48				08	18		12	14		14		18	132
Exit option: Award of UG Degree in Zoology (Level 5.5) with 132 credits OR Continue with Major and Minor														
VII	2	1	1	-	1	1 (4CR)		-	-		-		-	6 (22 CR
VIII	2	1	1	-	1	-		-	-		-		OJT (4CR)	6 (22 CR
Cum Cr.	76				16	22		12	14		14		22	176
Four Year UG Honours Degree in Zoology and Minor in xxx with 176 credits														

Programme Structure:

SN	Course	Code	Name	CA	EE	TM	Type	CR	Min %
[Level 4.5] Semester I : [22 Credits]									
01	DSC	ZOOC101	Animal Diversity	30	70	100	T	4	40%
02	DSC	ZOOC102	Lab Activities on ZOOC101	25	25	50	P	2	40%
03	OE	XXXE101	Select from other faculty OE courses List***	15	35	50	T	2	40%

04	OE	XXXE102	Select from other faculty OE courses List***	15	35	50	T	2	40%
05	VSC	ZOOV101	Vermiculture Management	25	25	50	TW	2	40%
06	SEC	SECS101	Basic Instrumentation Skills	25	25	50	TW	2	40%
07	AEC	AECL101	Listening and Speaking Skills in English	15	35	50	T	2	40%
08	VEC	VECD101	Introduction to the Constitution of India	15	35	50	T	2	40%
Select Any One from IKSK101 to IKSK105									
09	IKS	IKSK101	भारतीय ज्ञान परंपरा – कला आणि प्राचीन भारतीय भाषा	15	35	50	T	2	40%
		IKSK102	भारतीय ज्ञान परंपरा – सामाजिक शास्त्रे	15	35	50	T	2	40%
		IKSK103	भारतीय ज्ञान परंपरा – आरोग्य शास्त्र	15	35	50	T	2	40%
		IKSK104	भारतीय ज्ञान परंपरा – विज्ञान आणि तंत्रज्ञान	15	35	50	T	2	40%
		IKSK105	Indian Knowledge System – Generic (Offered in Online Mode)	15	35	50	T	2	40%
Select Any One from CCRX101 to CCRX106									
10	CC	CCRX101	Health and Wellness-I	50	-	50	TW	2	40%
		CCRX102	Yoga Education-I	50	-	50	TW	2	40%
		CCRX103	Sports and Fitness-I	50	-	50	TW	2	40%
		CCRX104	Cultural Activities-I	50	-	50	TW	2	40%
		CCRX105	NSS-I	50	-	50	TW	2	40%
		CCRX106	Fine/Applied/Visual/Performing Arts-I	50	-	50	TW	2	40%
[Level 4.5] Semester II : [22 Credits]									
11	DSC	ZOOC103	Comparative Anatomy & Developmental Biology of Vertebrates	30	70	100	T	4	40%
12	DSC	ZOOC104	Lab Activities on ZOOC103	25	25	50	P	2	40%

13	Minor	XXXM101	To be Selected from Minor Courses List **other than Major (DSC)****	15	35	50	T	2	40%
14	OE	XXXE103	Select from other faculty OE courses List***	15	35	50	T	2	40%
15	OE	XXXE104	Select from other faculty OE courses List***	15	35	50	T	2	40%
16	VSC	ZOOV102	Medical Laboratory Techniques	25	25	50	TW	2	40%
17	SEC	SECS102	MS-Excel with AI	25	25	50	TW	2	40%
18	AEC	AECL102	Reading and Writing Skills in English	15	35	50	T	2	40%
19	VEC	VECD102	Environmental Education	15	35	50	T	2	40%
Select Any One from CCRX107 to CCRX112									
20	CC	CCRX107	Health and Wellness-II	50	-	50	TW	2	40%
		CCRX108	Yoga Education-II	50	-	50	TW	2	40%
		CCRX109	Sports and Fitness-II	50	-	50	TW	2	40%
		CCRX110	Cultural Activities-II	50	-	50	TW	2	40%
		CCRX111	NSS-II	50	-	50	TW	2	40%
		CCRX112	Fine/Applied/Visual/Performing Arts-II	50	-	50	TW	2	40%
Exit option: Award of UG Certificate in Faculty of Science- Zoology (Level 4.5) with 44 credits and an additional 4 credits core NSQF course/ Internship OR Continue with Major and Minor									
[Level 5.0] Semester III : [22 Credits]									
21	DSC	ZOOC201	Animal Physiology & Ecology	30	70	100	T	4	40%
22	DSC	ZOOC202	Biology in Ayurveda	15	35	50	T	2	40%
23	DSC	ZOOC203	Lab Activities on ZOOC201	25	25	50	P	2	40%
24	Minor	XXXM201	To be Selected from Minor Courses List **other than Major (DSC) ****	15	35	50	T	2	40%
25	Minor	XXXM202	To be Selected from Minor Courses List **other than Major (DSC) ****	25	25	50	P	2	40%

26	OE	XXXE201	Select from other faculty OE courses List***	15	35	50	T	2	40%
27	VSC	ZOOV201	Apiculture	25	25	50	P	2	40%
28	AEC	AECL201	श्रवण आणि संभाषण कौशल्ये	15	35	50	T	2	40%
29	FP	ZOOF204	Field Project	50	-	50	TW	2	40%
Select Any One from CCRX201 to CCRX206									
30	CC	CCRX201	Health and Wellness-III	50	-	50	TW	2	40%
		CCRX202	Yoga Education-III	50	-	50	TW	2	40%
		CCRX203	Sports and Fitness-III	50	-	50	TW	2	40%
		CCRX204	Cultural Activities-III	50	-	50	TW	2	40%
		CCRX205	NSS-III	50	-	50	TW	2	40%
		CCRX206	Fine/Applied/Visual/ Performing Arts-III	50	-	50	TW	2	40%
[Level 5.0] Semester IV : [22 Credits]									
31	DSC	ZOOC205	Genetics & Evolutionary Biology	30	70	100	T	4	40%
32	DSC	ZOOC206	Microbiology	15	35	50	T	2	40%
33	DSC	ZOOC207	Lab Activities on ZOOC205	25	25	50	P	2	40%
34	Minor	XXXM203	To be Selected from Minor Courses List **other than Major (DSC)** **	15	35	50	T	2	40%
35	Minor	XXXM204	To be Selected from Minor Courses List **other than Major (DSC)** **	25	25	50	P	2	40%
36	OE	XXXE202	Select from other faculty OE courses List***	15	35	50	T	2	40%
37	SEC	SECS201	Intellectual Property Rights (IPR)	15	35	50	T	2	40%
38	AEC	AECL202	वाचन आणि लेखन कौशल्ये	15	35	50	T	2	40%
39	CEP	ZOOG208	Awareness of Sustainable Development Goals-I	50	-	50	TW	2	40%
Select Any One from CCRX207 to CCRX212									
40		CCRX207	Health and Wellness-IV	50	-	50	TW	2	40%

	CC	CCRX208	Yoga Education-IV	50	-	50	TW	2	40%
		CCRX209	Sports and Fitness-IV	50	-	50	TW	2	40%
		CCRX210	Cultural Activities-IV	50	-	50	TW	2	40%
		CCRX211	NSS-IV	50	-	50	TW	2	40%
		CCRX212	Fine/Applied/Visual/Performing Arts-IV	50	-	50	TW	2	40%
Exit option: Award of UG Diploma in Faculty of Science- Zoology (Level 5.0) with 88 credits and an additional 4 credits core NSQF course/ Internship OR Continue with Major and Minor									
[Level 5.5] Semester V : [22 Credits]									
41	DSC	ZOOC301	Mammalian Histology	30	70	100	T	4	40%
42	DSC	ZOOC302	Marine Ecology	15	35	50	T	2	40%
43	DSC	ZOOC303	Lab Activities on ZOOC301	50	50	100	P	4	40%
Select Any One from ZOOC304, ZOOC305, ZOOC306									
44	DSE	ZOOC304	Techniques in Medical Forensic Zoology	30	70	100	T	4	40%
	DSE	ZOOC305	Apiculture & Sericulture	30	70	100	T	4	40%
	DSE	ZOOC306	Wildlife Conservation	30	70	100	T	4	40%
45	Minor	XXXM301	To be Selected from Minor Courses List **other than Major (DSC)** **	15	35	50	T	2	40%
46	Minor	XXXM302	To be Selected from Minor Courses List **other than Major (DSC)** **	25	25	50	P	2	40%
47	VSC	ZOOV301	Aquarium Management	25	25	50	P	2	40%
Select ZOOF307 or ZOOG308									
48	FP	ZOOF307	Field Project	50	-	50	TW	2	40%
	CEP	ZOOG308	Awareness of Sustainable Development Goals-II	50	-	50	TW	2	40%
[Level 5.5] Semester VI : [22 Credits]									
49	DSC	ZOOC309	Pest Management & Parasitology	30	70	100	T	4	40%

50	DSC	ZOOC310	Welfare & Behaviour of Domesticated Animals	15	35	50	T	2	40%
51	DSC	ZOOC311	Lab Activities on ZOOC309	50	50	100	P	4	40%
Select Any One from ZOOC312, ZOOC313, ZOOC314,									
52	DSE	ZOOC312	Aquarium & Poultry Management	30	70	100	T	4	40%
	DSE	ZOOC313	Economic Zoology	30	70	100	T	4	40%
	DSE	ZOOC314	Biostatistics & Bioinformatics	30	70	100	T	4	40%
53	Minor	XXXM303	To be Selected from Minor Courses List **other than Major (DSC)** **	15	35	50	T	2	40%
54	Minor	XXXM304	To be Selected from Minor Courses List **other than Major (DSC)** **	25	25	50	P	2	40%
55	OJT	ZOOO315	On Job Training	50	50	100	TW	4	40%
Exit option: Award of UG Degree in Zoology (Level 5.5) with 132 credits OR Continue with Major and Minor									
[Level 6.0] Semester VII : [22 Credits]									
56	DSC	ZOOC401	Biochemistry	30	70	100	T	4	40%
57	DSC	ZOOC402	Cell Biology	30	70	100	T	4	40%
58	DSC	ZOOC403	Applied Zoology Part-I	15	35	50	T	2	40%
59	DSC	ZOOC404	Lab on Biochemistry, Cell Biology & Applied Zoology Part-I	50	50	100	P	4	40%
60	RM	RESR405	Research Methodology	30	70	100	T	4	40%
Select Any One from ZOOC406, ZOOC407									
61	DSE	ZOOC406	Developmental Biology	30	70	100	T	4	40%
	DSE	ZOOC407	Entomology	30	70	100	T	4	40%
[Level 6.0] Semester VIII : [22 Credits]									
62	DSC	ZOOC409	Molecular Biology	30	70	100	T	4	40%
63	DSC	ZOOC410	Genetics	30	70	100	T	4	40%

64	DSC	ZOOC411	Applied Zoology Part-II	15	35	50	T	2	40%
65	DSC	ZOOC412	Lab on Molecular Biology, Genetics & Applied Zoology Part-II	50	50	100	P	4	40%
66	OJT	ZOOO413	On Job Training	50	50	100	TW	4	40%
Select Any One from ZOOC415, ZOOC416									
67	DSE	ZOOC415	Animal Biotechnology	30	70	100	T	4	40%
	DSE	ZOOC416	Toxicology	30	70	100	T	4	40%
Four Year UG Honours Degree in Zoology and Minor in xxx with 176 credits									

Minor Courses offered in Zoology discipline for other discipline of same faculty or different faculty:

- These minor courses may be selected by learners who have not selected Zoology as Major:

SN	Course	Code	Name	CA	EE	TM	Type	CR	Min%
Semester II									
01	Minor	ZOOM101	Animal Diversity of Invertebrates	15	35	50	T	2	40%
Semester III									
02	Minor	ZOOM201	Principle of Ecology	15	35	50	T	2	40%
03	Minor	ZOOM202	Lab Activities on ZOOM201	25	25	50	P	2	40%
Semester IV									
04	Minor	ZOOM203	Fundamentals of Cell Biology	15	35	50	T	2	40%
05	Minor	ZOOM204	Lab Activities on ZOOM203	25	25	50	P	2	40%
Semester V									
06	Minor	ZOOM301	Introduction to Aquatic Biology	15	35	50	T	2	40%
07	Minor	ZOOM302	Lab Activities on ZOOM301	25	25	50	P	2	40%
Semester VI									
08	Minor	ZOOM303	General Parasitology	15	35	50	T	2	40%
09	Minor	ZOOM304	Lab Activities on ZOOM303	25	25	50	P	2	40%

- Zoology learners may select minor courses from the following discipline:

SN	Major in	Minor in **(Anyone of the following other than Major):** Refer Appendix I
1	Zoology	Physics, Chemistry, Mathematics, Botany, Environmental Science

Open Elective (OE) Courses of Zoology offered for other Faculty

SN	Course	Code	Name	CA	EE	TM	Type	CR	Min %
Semester I									
01	OE	ZOOE101	Vermicomposting Management	15	35	50	T	2	40%
02	OE	ZOOE102	Sericulture Management	15	35	50	T	2	40%
Semester II									
03	OE	ZOOE103	Poultry Management	15	35	50	T	2	40%
04	OE	ZOOE104	Goat Farming	15	35	50	T	2	40%
Semester III									
05	OE	ZOOE201	Dairy Production & Management	15	35	50	T	2	40%
Semester IV									
06	OE	ZOOE202	Nutrition, Health & Hygiene	15	35	50	T	2	40%

Total Credits: **132** and **Total Courses**: **55** {3Y UG degree}
Total Credits: **176** and **Total Courses**:**67** {4Y UG degree}

Detailed Syllabi: Available at
https://drive.google.com/drive/folders/13lNyj1PT7qN-AAAi2eE8fwDAsCQFWMQz?usp=drive_link

- Programme Outcomes and Courses Outcomes: Refer **Appendix – II**

Minimum programme duration:

- 3 yrs {for 3Y UG degree} and 4 yrs {4Y UG (Honours) degree}

Maximum Programme Duration:

- 6 yrs {for 3Y UG degree} and 8 yrs {4Y UG (Honours) degree}

Medium of Instruction: English

Type of Program: General

Faculty and Support Staff:

Director, School of Sciences: Prof. Chetana Kamlaskar
Academic coordinator: Mr. Ravindra K. Bharsat

Instructional Design & Delivery Mechanism:

In order to ensure and maintain the quality in science education, face-to-face counseling for theory and activities type of courses will be conducted at the designated LSCs during Saturdays and Sundays.

- **Minimum number of face-to-face counseling sessions:** 12 (for 4 Credits)

  - (For each theory type of course of 4 credits duration of each counseling session shall be 01 Clock Hour)

  - (For each Practical/Project type of course of 4 credits duration of each counseling session shall be 02 Clock Hour).

- **Minimum number of face-to-face counseling sessions:** 6 (for 2 Credits)

  - (For each theory type of course of 2 credits duration of each counseling session shall be 01 Clock Hour)

  - (For each Practical/Term work type of course of 2 credits duration of each counseling session shall be 02 Clock Hour).

- **Number of On Job Training (OJT) hours:** 120 hr (for 4 Credits)

- One month 'On Job Training (OJT)' or Internship (Total Study hours 120 hrs including Internship Report)

- **Required study efforts**:
  1. For 3Y UG degree: Total **3960** Hours including Self-Study during all 06 semesters. 660 Hours (including Self-Study) during each semester.
  2. For 4Y UG (Honours) degree: Total **5280** Hours including Self-Study during all 08 semesters. 660 Hours (including Self-Study) during each semester.

- **Attendance**: Minimum 80% attendance recommended for all activity type of courses

- **eBook**: eBook in SLM format for each course (Free Download from University website) at all semesters I to semester VIII

Student Support Service System:

At headquarter: Support from School, SSD, Evaluation Division and Exam Unit-3

At Regional Centers: From all 8 regional centers within MH

At Learner Support Centers: Recognized Learner support centers within MH

Web Based:

http://www.ycmou.ac.in

http://ycmou.digitaluniversity.ac

<table>
<tr>
<td>f</td>
<td>Procedure for admissions, curriculum transaction and evaluation
1. Define the Admission Policy (including web based tools to be adopted:
2. Eligibility Criteria:
3. Fee Structure:
4. Financial assistance to Learners (if any):
5. Activity planner of all academic activities of the academic session:
6. Exit Option- UG Certificate UG Diploma, UG Degree:
Policy for Evaluation of learner progress along with methods and tools:</td>
<td>All information related to the programme like admission policy, eligibility and fee structure, course curriculum, medium of instruction, evaluation policy - online home assignments and end examination pattern, SLMs etc. are transacted through prospectus, university website and official notification.
Admissions procedure: A customized “Online Annual Admission system” available at DU portal
http://ycmou.digitaluniveristy.ac
Online payment facility is made available using a credit card or debit card or internet banking.
Admission Eligibility: Entry level qualification to B. Sc. (Honours) programmes
<table>
<tr><th>SN</th><th colspan="3">Academic Qualifications required for Eligibility</th></tr>
<tr><td>A)</td><td colspan="3">A candidate who has passed Standard 12th / (10+2)th / Level 4.0 examination conducted by Maharashtra State Board of Secondary and Higher Secondary Education/CBSE/ ISC/NIOS or equivalent examinations by any Other State or any other recognized Board with science subjects shall be eligible for admission to First Semester B. Sc. Programmes as per NEP 2020:</td></tr>
<tr><td></td><td colspan="2">Groups of Science subjects/courses from</td><td>Eligible for Any One Major in Science Discipline</td></tr>
<tr><td>1.</td><td colspan="2">1. English
2. Physics, Chemistry, Mathematics, Biology</td><td>Any One Major from: Physics, Chemistry, Mathematics, Botany, Zoology, Environmental Science</td></tr>
<tr><td>2.</td><td colspan="2">1. English
2. Physics, Chemistry, Mathematics</td><td>Any One Major from: Physics, Chemistry, Mathematics, Environmental Science</td></tr>
<tr><td>3.</td><td colspan="2">1. English
2. Physics, Chemistry, Biology</td><td>Any One Major from: Physics, Chemistry, Botany, Zoology, Environmental Science</td></tr>
<tr><td>4.</td><td colspan="2">1. English
2. Vocational Course of 200 Marks
3. Physics, Chemistry, Mathematics</td><td>Any One Major from: Physics, Chemistry, Mathematics, Environmental Science</td></tr>
<tr><td>5.</td><td colspan="2">1. English
2. Vocational Course of 200 Marks
3. Physics, Chemistry, Biology</td><td>Any One Major from: Physics, Chemistry, Botany, Zoology, Environmental Science</td></tr>
<tr><td rowspan="2">6.</td><td rowspan="2">1. English
2. Physics, Chemistry</td><td>3. Any one of the following Optional Course of 100 Marks:

Geography, Geology, Food Science and Technology, Agriculture Science and Technology, Animal Science and Technology, Defence Studies</td><td>Any One Major from: Physics, Chemistry, Environmental Science</td></tr>
<tr><td>3. Any one of the following Optional</td><td>Major: Botany</td></tr>
</table>
</td>
</tr>
</table>

		Course of 100 Marks: Food Science and Technology, Agriculture Science		
		3. Optional Course of 100 Marks: Animal Science and Technology		**Major**: **Zoology**
OR				
B)	A candidate who has passed (10+3) years or (12+2) years Diploma from Maharashtra State Technical Board / a statutory or recognized board/ university in India			
	Description			**Eligible for Any One Major in Science Discipline**
1.	(10+3) years / (12+2) years Engineering Diploma			**Any One Major from:** Physics, Chemistry, Mathematics, Environmental Science
OR				
C)	A candidate who has passed Higher Secondary School Certificate (10+2) Examination with English and any of the following +2 Level HSC Vocational (MCVC) Group			
	HSC Vocational (MCVC) Group			**Eligible for Any One Major in Science Discipline**
1.	Agriculture Group or Fisheries Group	Horticulture (KA, KB, KC)		**Any One Major from:** Botany, Environmental Science
		Crop Science (LA, LB, LC)		
		Animal Husbandry and Dairy Technology (MA, MB, MC)		**Any One Major from:** **Zoology**, Environmental Science
		Fisheries Technology (NA, NB, NC)		
2.	Catering and Food Products Technology	Catering and Food Products Technology (SA, SB, SC)		**Any One Major from:** Botany, **Zoology**, Environmental Science
3.	Paramedical Group	Child, Old Age and Health care services (QA, QB, QC)		**Any One Major from:** Botany, **Zoology**, Environmental Science
		Medical Laboratory Technician (OA, OB, OC)		**Any One Major from:** Physics, Chemistry, **Zoology**
		Ophthalmic Technician (RA, RB, RC)		**Major:** Physics
		Radiology Technician (PA, PB, PC)		

4.	Technology Group	Electronics Technology (EA, EB, EC)	**Major:** Physics
		Electrical Technology (FA, FB, FC)	

Total programme Fee: Approximately ₹ 28,724/- for all 06 Semesters and Total ₹ 52,292/- for all 08 Semesters, which is duly approved by the university authorities [*Will be updated as per University Policy decision*]

Curriculum Transaction:

- 01 SLM e-Book will be developed for each theory course
- Total 12/06 Face-To-Face counseling sessions, each of 60 Minutes duration, will be provided at respective learner support center, for each theory course.
- Total 12/18 Face-To-Face counseling sessions, each of 120 Minutes duration, will be provided at respective learner support center, for each practical/Field project/ OJT/ CC courses. In the laboratory, instruction would be given for the experiments followed by demonstration and finally the learners have to do the experiments individually.
- Curriculum updation will be after every 3 years

Activity planner: This University and School will follow the Programme Calender declared by UGC/DEB, New Delhi time to time. Teaching-Learning of students shall start from 01-September/01-Feb every year. Online continuous assessment proposed for all offered programmes.

SN	Activity Description	Yearly Pattern/ Odd semesters like 01, 03, 05 and 07 From 01-Sep Till 31-Jan	Even semesters like 02, 04, 06 and 08 From 01-Feb Till 31-Jul
Online Admission: offered on Annual basis for 2 semesters in each academic year. Only for 'C149: Certificate progarmme in Beekeeping', Admissions shall be offered on Winter and Summer batch basis.			
01	Fresh and Further Yearly Admission	From 1st June 2025 Till Sept 2025 (For C149, Winter Batch: From Jul)	NA (For C149, Summer Batch: From Jan)
Teaching – Learning at the resp Learning Support Centers/ SCs for all Theory, Practical, Term-Work, Studio, Project, FP & OJT Courses			
02	Teaching – Learning (16 Weeks) & Backlog Clearing	**From 1st Sept 2025 Till 14th Dec 2025**	**From 18th Jan 2026 Till 19th April 2026**
Online End Exam (EE) Form Submission (Required only for Repeater Students)			
03	**Online** EE Form Submission by SCs/ students at University	On or Before 21-Oct	On or Before 23-Apr

Continuous Assessment (CA) Submission			
04	CA Availability	August 2025	March 2025
05	CA Submission by Students	Upto last week of Dec 2025	Upto first week of Apr 2026
End Examination (EE) (Required only for Non-Repeater Students)			
07	**Online** EE Form Submission by SCs/ students at University	Upto third week of Oct 2025	Upto first week of Apr 2026
07	**End Exam for Theory Courses**	**From First Week of Jan 2026**	**From First Week of May 2026**
08	EE for Activity Courses (Pr, TW, PW, STW, SV)	Immediately after/ before the schedule of the end exam for theory courses, but positively before **1st Dec 2025 to 31st Dec 2025**	Immediately after/ before the schedule of the end exam for theory courses, but positively before **10th Apr 2026 to 10th May 2026**
09	OJT/Field Project (Completion Report/Presentation/ Viva)	After Winter exam- Within One Month	After Summer exam- Within One Month
10	End Exam Result Declaration	Within 45 days from the last day of End Exam	Within 45 days from the last day of End Exam
Semester End Vacation			
10	Semester End Vacation	Jan	July

Policy:
Refer Evaluation pattern given in Appendix III.

For exit option:

1. **Multiple Entry Multiple Exit Option**:
   Compliance with MS G.R. No. NEP-2022/CR No. 09/VISHI-3/शिकाना, dated 20 April, 2023.

SN	Level of the Programme	Entry Option (with criteria)	Exit Option (with criteria)
1	Certificate Level	12th / (10+2)th / Level 4.0 examination conducted by Maharashtra State Board of Secondary and Higher Secondary Education/CBSE/ ISC/NIOS or equivalent examinations by any Other State or any other recognized Board with Science Subjects Pass, including English and Biology / (Physics,	Award of UG Certificate in the Faculty of Science - Zoology (Level 4.5) with 44 credits and an additional 4 credits core NSQF course/ Internship.

				Chemistry & Optional Course) or Equivalent pass **OR** Higher Secondary School Certificate (10+2) Examination with English and any of the following +2 Level HSC Vocational (MCVC) Group Pass* (Listed Above)	
		2	Diploma Level	UG Certificate in the Faculty of Science – Zoology (Level 4.5) with 40-44 credits	Award of UG Diploma in the Faculty of Science – Zoology (Level 5.0) with 88 credits and an additional 4 credits core NSQF course/ Internship
		3	Degree Level	UG Diploma in the Faculty of Science – Zoology (Level 5.0) with 88 credits	Award of UG Degree in Zoology with 132 credits
g	Requirement of the Laboratory Support and Library Resources: 1. Laboratory Support to the learners (*if any*): 2. Provision of Practical book for learners (*if any*): Provision of Virtual Reality Methods for Practical in case of Online learning (*if any*):	Laboratory requirement and Library Resources – Yes. Being mandatory requirement of the programme, Institutes/Colleges affiliated with conventional university offering B.Sc. (Honours) (Zoology) will be only recognized as a Learner support center of this university for this programme. So, requirement of laboratory support and library resources will be automatically ensured. Additionally, school provides practical workbook in the form SLM book and other learning resources to all enrolled learners. University has already initiated in-house Science Laboratory development task at HQ, these labs will be made available to the enrolled learners in future. **Recommended**: Recognized LSCs with • Computer infrastructure with Wi-Fi/broadband connection with Zoology related software/tool and Library facilities			
h	Cost Estimate of the Program and the Provisions: Indicate the Budgetary Requirement for: 1. Programme Development	Budget provision for this development under A.27.P.38: Fees/Royalties/ Honorarium to Writer/Editors/Trans. SLM development cost: approximately ₹ 60,00,000/-			

	2. Program Delivery Program Maintenance	
i	Quality Assurance Mechanism and expected Program Outcomes*: 1. Define the Review Mechanism of the Program for enhancing the standards of curriculum, instructional design relevant to professional requirements: 2. Define Program Benchmark Statements: 3. Mechanism for Monitoring the effectiveness of the program: ***(Minimum standards must adhere to "UGC Open and Distance Learning Programmes and Online Programmes Regulations, 2020" & directions of the Statutory Bodies of the University)**	B.Sc. (Honours) programme is designed to provide scientific as well as professional level competency to learners, and offers advanced theoretical as well as practical knowledge to learners. This programme enables the learner to develop interest in knowing more about the Zoology and to develop research attitude. University has policy to review and revise every course at least once in five years of its launching. **Quality Assurance Mechanism**: The following key result areas will be closely monitored. • Well qualified and experienced experts nomination on Programme Advisory Committee (PAC) for design and development of relevant course content • Well qualified subject experts for SLM development and Evaluation task • Enrolment of student (Equated Access) • Equal weightage for each credit in learner evaluation • Demonstrate in-depth knowledge of Zoology, both in theory and practical • Examination Results • Placements/satisfaction of passing out students • Administrative/stakeholder feedback • Centre for Internal Quality Assurance (CIQA) to ensure quality of offered science programmes **Expected Program Outcomes:** After successful completion of this programme, learners will be able to inculcate the following competencies: • Demonstrate interdisciplinary competence by applying principles from Zoology related real-life applications. • Exhibit a profound understanding of core concepts and theories in Zoology. • Excel in critical thinking and problem-solving, addressing complex issues that span Zoology discipline. • Possess proficiency in laboratory techniques, enabling the design and execution of experiments in Zoology. • Engage in interdisciplinary research projects and contribute to scientific advancements. • Communicate scientific findings effectively, both in written reports and oral presentations. • Adhere to ethical standards and academic in terrify in research and experimentation. • Adapt to diverse career opportunities, showing flexibility in their choice of career paths. • Collaborate effectively in multidisciplinary teams, displaying leadership and teamwork skills. • Stay informed about contemporary scientific issues, including their societal implications

B. **Duration & Nomenclature**

Name of Programme: -	4 Year Bachelor of Science (Honours) (Zoology)
Medium	English
Year	2026-27
Level	UG, Level 4.5
Academic Session	July Onwards
Entry Qualification (as per the Specification of Degrees, 2014)	12th / (10+2)th / Level 4.0 examination conducted by Maharashtra State Board of Secondary and Higher Secondary Education/CBSE/ ISC/NIOS or equivalent examinations by any Other State or any other recognized Board with Science Subjects Pass, including English and Biology / (Physics, Chemistry & Optional Course) or Equivalent pass OR Higher Secondary School Certificate (10+2) Examination with English and any of the following +2 Level HSC Vocational (MCVC) Group Pass Animal Husbandry and Dairy Technology (MA, MB, MC) Fisheries Technology (NA, NB, NC) Catering and Food Products Technology (SA, SB, SC) Child, Old Age and Health care services (QA, QB, QC) Medical Laboratory Technician (OA, OB, OC) For details Refer **Appendix IV**
Duration (as per the Specification of Degrees, 2014)	4 Year
Name of the Department	School of Sciences

C. **Mode of Evaluation**

Year	2026-27	
Whether Weightages to continuous assessment and end semester examinations or term end examinations as per clause mentioned in Regulations	Yes 1. 30% - 70% weightage Pattern for Theory 2. 50% - 50% Weightage pattern for Practical/OJT/ VSC/SEC* * Only one SEC course is Theory type 3. 100% Continuous Assessment for FP/CC/CEP	
Examination Scheme	Formative and Summative	
Percentage of Continuous Assessment (%)	Theory	30%
	Practical/OJT /VSC/SEC	50%
	FP/CC/ CEP	100%
	Passing	40%
Percentage of Term End Examination (%)	Theory	70%
	Practical/OJT/ VSC/SEC	50%
	Passing	40%

Pass or Fail Criteria	40% for Pass
Pass/Fail Criteria (% Pass Marks)	40% and above - Pass Below 40 % - Fail

D. Mode of Examination

Whether examination through Online (For ODL Programs)	No

E. SLM Development (Submit all SLM in pdf in pen drive and prepare the SLM availability sheet in the order as per sample in pdf for each program separately)

Particulars	% SLM in house developed	% SLM in collaboration with with HEI (It should not be more than 40% of total SLM. If it is in collaboration then provide MOU in Soft & Hard copy
Printing Material	100%	–
Audio-Video Material	-	–
Online Material	Yes [pdf of SLMs]	–
Compute based Material	–	–

F. Program wise faculty details (Requirement of Minimum three faculty not below the rank of Assistant Professor to be furnished in the following format – to be taken from Establishment

Sr. No.	Emp. No	Name of the Faculty	Designation	Date of Joining	Qualification	Specialization	Teaching experience	Address	Phone no	Email	Appointment letter
1	Y1050	Mr. Ravindra K. Bharsat	Academic Coordinator	09/03/2024	M.Sc. Zoology, SET-Life Sciences	Zoology	3.7 Years	YCMOU	9665768152	bharsatravindra12@gmail.com	04/03/2024

G. List of Learner Support Centres Program wise and Region wise to be submitted as per following format. (We have intimated the same to Director SSD. **You are requested to give him the list of programs for which the LSCs data is required.**) – to be taken from SSD Director

Sr. No	Study centre code	Name & Address of LSC	Name of the HEI to which college/Institute is affiliated (where LSC is established)	Whether the College /Institute Private or Govt. (where LSC is established)	Name and Contact Details of Coordinator/ counsellor:	Qualification of Coordinator/ Counsellor:	No. of Counsellor:	Name of Proposed Programmes/ Course from July, 2023 onwards:	Approved	Not Approved with Reason

Appendix-I

Minor Courses offered from School of Sciences for other discipline of same faculty or different faculty other than Zoology as a Major

LEVEL/ SEM	C R.	C. T.	Physics	Chemistry	Mathematics	Botany	Environmental Science
4.5/ II	2	T	**PHYM101:** Basics of Electricity & Magnetism	**CHEM101:** Basic of Physical Chemistry	**MATM101:** Foundation of Mathematics	**BOTM101**: Plant Diversity	**EVSM101:** Fundamentals of Environment
5.0 /III & IV	2	T	**PHYM201:** Thermal Physics	**CHEM201:** Introduction to Organic Chemistry	**MATM201:** Fundamentals of Calculus	**BOTM201**: Morphology and Anatomy of Flowering Plants	**EVSM201:** Wildlife Biology
	2	P	**PHYM202:** Lab Activities on PHYM201	**CHEM202:** Lab Activities on CHEM201	**MATM202:** Practical Based on MATM201	**BOTM202:** Lab Activities on BOTM201	**EVSM202:** Lab Activities on EVSM201
	2	T	**PHYM203:** Oscillations & Optics	**CHEM203:** Introduction to Inorganic Chemistry	**MATM203:** Applied Linear Algebra	**BOTM203:** Plant Physiology	**EVSM203:** Water & Noise Quality
	2	P	**PHYM204:** Lab Activities on PHYM203	**CHEM204:** Lab Activities on CHEM203	**MATM204:** Practical Based on MATM203	**BOTM204**: Lab Activities on BOTM203	**EVSM204:** Lab Activities on EVSM203
5.5/ V & VI	2	T	**PHYM301:** Computational Physics	**CHEM301:** Advanced Physical Chemistry	**MATM301:** Introductory Differential Equations	**BOTM301:** Introduction to Cytology	**EVSM301:** Air & Soil Quality
	2	P	**PHYM302:** Lab Activities on PHYM301	**CHEM302:** Lab Activities on CHEM301	**MATM302:** Practical Based on MATM301	**BOTM302:** Lab Activities on BOTM301	**EVSM302:** Lab Activities on EVSM 301
	2	T	**PHYM303:** Basics of Instrumentation	**CHEM303:** Introduction to Organic and Inorganic Chemistry	**MATM303:** Numerical Methods	**BOTM303:** Plant Genetics and Variation	**EVSM303:** Environmental Governance
	2	P	**PHYM304**: Lab Activities on PHYM303	**CHEM304:** Lab Activities on CHEM303	**MATM304:** Practical Based on MATM303	**BOTM304:** Lab Activities on BOTM303	**EVSM304:** Lab Activities on EVSM 303

Appendix – II

Programme Objectives, Scope of the Programme & Programme Outcomes (PO)

And

Course Outcomes (CO)

Programme Name: 4 Year Bachelor of Science (Honours) (Zoology)		
1	**Programme Objectives**	This programme has the following broad objectives: • Access to Science Education: To provide science education opportunities through LEARNER Open and Distance Learning (ODL), making learning accessible and cost effective. • Deep Understanding: To ensure that students gain a deep understanding of the fundamental principles and concepts in Zoology. • Problem-Solving Abilities: To equip students with problem-solving skills, enabling them to apply scientific methodologies to address complex issues that require expertise in zoology discipline. • Laboratory Proficiency: To develop practical laboratory skills, enabling students to design experiments, collect data, and analyze results in Zoology. • Research Aptitude: To nurture research aptitude by encouraging students to engage in interdisciplinary research projects at the undergraduate level. • Effective Communication: To enhance communication skills, allowing students to communicate scientific findings effectively, both in writing and orally. • Flexibility and Adaptability: To prepare students for diverse career opportunities, including academia, research, industry, and entrepreneurship, by offering a versatile skill set.
2	**Scope of the Programme**	After successful completion of this programme, learners may get opportunities in various fields/sectors to work as • Flexible Career Paths: Graduates of this Programme are well-prepared for diverse career opportunities, including academia, research, industry, and entrepreneurship/Start-up. They can pursue careers in areas such as Wildlife Biologist, Clinical Research, Biotech Researcher, and more. • Career opportunities in both private and government sector/ in India and abroad: Wildlife Conservationist, Ecologist, Forensic Technician, Aquarist, Marine biologist, Entomologist, Educator.

<table>
<tr><td>3</td><td>Programme Outcome</td><td>After successful completion of this programme, learners will be able to inculcate the following competencies:
Demonstrate interdisciplinary competence by applying principles from Zoology for real-life applications.
Exhibit a profound understanding of core concepts and theories in Zoology.
Excel in critical thinking and problem-solving, addressing complex issues that span Zoology discipline.
Possess proficiency in laboratory techniques, enabling the design and execution of experiments in Zoology.
Engage in interdisciplinary research projects and contribute to scientific advancements.
Communicate scientific findings effectively, both in written reports and oral presentations.
Adhere to ethical standards and academic in terrify in research and experimentation.
Adapt to diverse career opportunities, showing flexibility in their choice of career paths.
Collaborate effectively in multidisciplinary teams, displaying leadership and teamwork skills.
Stay informed about contemporary scientific issues, including their societal implications.</td></tr>
<tr><td>4</td><td>Course Outcomes</td><td>
<table>
<tr><th>SN</th><th>Course Code & Name</th><th>Course Outcomes
(After successful completion of the course, student should be able to-)</th></tr>
<tr><td colspan="3">Semester I</td></tr>
<tr><td>1</td><td>ZOOC101: Animal Diversity</td><td>Demonstrate a solid understanding of the diversity of animal life.
Develop the ability to identify common animals.
Apply critical thinking skills to analyze and compare animal adaptations, behaviors, and evolutionary patterns.
Recognize ethical considerations related to animal research, conservation, and humane treatment.
Apply knowledge of animal diversity to solve real-world ecological and conservation problems.</td></tr>
<tr><td>2</td><td>ZOOC102: Lab Activities on ZOOC101</td><td>Demonstrate a solid understanding of the diversity of animal life.</td></tr>
</table>
</td></tr>
</table>

					• Develop the ability to identify common animals. • Apply critical thinking skills to analyse and compare animal adaptations, behaviors, and evolutionary patterns. • Apply knowledge of animal diversity to solve real-world ecological and conservation problems.
			3	**ZOOE101:** Vermicomposting Management	• Recognize various species of Earthworms in India, both exotic and indigenous races. • Gain thorough knowledge about the techniques involved in Earthworm rearing and Vermicompost preparation. • Develop entrepreneurial skills necessary for self-employment in Vermicomposting.
			4	**ZOOE102:** Sericulture Management	• Understand of the basic principles of sericulture, including the life cycle of silkworms and their biological needs. • Proficient in the methods and best practices for rearing silkworms, including feeding, housing, and health management. • Handle processes involved in silk production, from cocoon harvesting to silk reeling, and be able to implement quality control measures.
			5	**ZOOV101:** Vermiculture Management	• Recognize various species of Earthworms in India, both exotic and indigenous races. • Be aware about the opportunities and employment in rural cottage industry. • Gain thorough knowledge about the techniques involved in earthworm rearing and Vermicompost preparation. • Develop entrepreneurial skills necessary for self-employment in vermicomposting.
			6	**SECS101:** Basic Instrumentation Skills	• Demonstrate competence in using various instruments and equipment. • Safely conduct experiments and collect reliable data. • Analyze and interpret experimental results effectively.

				• Apply instrumentation skills in their respective fields of study and research. • Foster a culture of safety, ethics, and environmental responsibility in scientific work. • Identify, describe, and explain the function of various scientific instruments used in their respective field. • Demonstrate correct operation, calibration, and maintenance procedures for laboratory instruments, ensuring accuracy and reliability in their measurements. • Adhere to laboratory safety guidelines, use personal protective equipment (PPE) appropriately, and follow best practices to minimize risks and ensure a safe working environment.
		7	**AECL101:** Listening and Speaking Skills in English	• Students will be able to identify, comprehend, and interpret main ideas and supporting details in spoken English across different contexts using active and critical listening strategies. • Students will demonstrate correct pronunciation, stress, and intonation in spoken English, showing increased fluency and confidence in both academic and social interactions. • Students will be able to initiate and sustain basic conversations using polite expressions, greetings, and small talk appropriate to different situations. • Students will engage effectively in extended conversations in formal and informal contexts, using cohesive devices and demonstrating good interactional competence and turn-taking skills. • Students will participate constructively in group discussions, express opinions logically and respectfully, and respond persuasively to others' viewpoints. • Students will perform effectively in interviews, applying suitable verbal and non-verbal communication

					techniques with confidence and professional self-presentation. • Students will communicate accurately and courteously over the telephone, demonstrating clarity, appropriate etiquette, and the ability to handle both formal and informal telephonic interaction.
		8	**VECD101:** Introduction to the Constitution of India		• Understand the philosophy, structure, and values of the Constitution of India. • Gain awareness about Fundamental Rights, Fundamental Duties, and Directive Principles of State Policy. • Understand the role and functioning of constitutional institutions such as Parliament, Executive, and the Judiciary. • Understand Citizenship, Democracy, and the Rule of Law. • Develop the capacity to critically analyze constitutional provisions and contemporary political issues.
		9	**IKSK101** भारतीय ज्ञान परंपरा – कला आणि प्राचीन भारतीय भाषा		• To be Updated
			IKSK102 भारतीय ज्ञान परंपरा – सामाजिक शास्त्रे		• To be Updated
			IKSK103 भारतीय ज्ञान परंपरा – आरोग्य शास्त्र		• To be Updated
			IKSK104 भारतीय ज्ञान परंपरा – विज्ञान आणि तंत्रज्ञान		• To be Updated
			IKSK105 Indian Knowledge System – Generic		• To be Updated
		10	**CCRX101:** Health and Wellness-I		• To be Updated
			CCRX102 Yoga Education-I		• To be Updated
			CCRX103 Sports and Fitness-I		• To be Updated
			CCRX104 Cultural Activities-I		• To be Updated
			CCRX105		• To be Updated

			NSS-I	
			CCRX106 Fine/Applied/Visual/Performing Arts-I	• To be Updated
		Semester II		
		1	**ZOOC103:** Comparative Anatomy & Developmental Biology of Vertebrates	• Analyze and compare the anatomy of different vertebrate species to identify common patterns and unique adaptations. • Explain the functional significance of anatomical features and how they relate to the ecological and physiological characteristics of vertebrates. • Apply an evolutionary perspective to interpret the similarities and differences in vertebrate anatomy and development. • Recognize how the study of vertebrate anatomy and development intersects with other scientific disciplines, such as evolutionary biology, ecology, and physiology.
		2	**ZOOC104:** Lab Activities on ZOOC103	• Analyze and compare the anatomy of different vertebrate species to identify common patterns and unique adaptations. • Explain the functional significance of anatomical features and how they relate to the ecological and physiological characteristics of vertebrates. • Apply an evolutionary perspective to interpret the similarities and differences in vertebrate anatomy and development. • Recognize how the study of vertebrate anatomy and development intersects with other scientific disciplines, such as evolutionary biology, ecology, and physiology.
		3	**ZOOM101:** Animal Diversity of Invertebrates (For other Discipline)	• Understand, classify and identify the diversity of animals. • Recognize his role in nature as a protector, preserver and promoter of life which he has achieved by learning, observing and understanding life.
		4	**ZOOE103:** Poultry Management	• Use poultry skills to set an operational farm for more profit management, feed requirements.

					• Suggest measure for health care in poultry. • Evaluate the economics of poultry production. • Differentiate the poultry hatchery practices.
		5	**ZOOE104:** Goat Farming		• Identify and classify various goat breeds and select the most suitable breeds based on specific farming objectives, whether for meat, milk, fiber, or dual-purpose. • Handle daily goat management tasks, such as feeding, milking, grooming, and maintaining infrastructure, ensuring they can perform these tasks independently. • Demonstrate proficiency in developing and implementing effective feeding programs, managing goat housing, and optimizing pasture utilization to enhance goat health and productivity.
		6	**ZOOV102:** Medical Laboratory Techniques		• Explain the good laboratory practices and work safely in the laboratory. • Identify the different lab safety symbols and describe them. • Explain the principle and working of various basic laboratory instruments like a colorimeter, spectrophotometer, electrophoresis and pH meter. • Use of appropriate glassware for solution preparation. • Apply knowledge and technical skills associated with medical lab technology.
		7	**SECS102:** MS-Excel with AI		• Effectively use basic Excel functions and features to perform data analysis and manipulation tasks. • Create various types of charts and visualizations in Excel and interpret them to extract meaningful insights • Use Excel's statistical tools to perform and interpret basic statistical analyses. • Leverage AI-powered features in Excel to gain insights and enhance their data analysis capabilities. • Use Power Query to import, clean, and transform data from various sources efficiently. • Create and use macros to automate repetitive tasks, improving efficiency in

					Excel.
		8	**AECL102:** Reading and Writing Skills in English	• Demonstrate an expanded vocabulary and apply appropriate word choices in reading and writing contexts, and comprehend, interpret, and analyse different types of texts with accuracy and critical understanding. • Employ suitable reading strategies to achieve specific objectives such as skimming, scanning, and intensive reading, and read efficiently with improved speed and retention, adjusting pace according to text difficulty, and interpret data and information effectively from tables, charts, diagrams, and graphs. • Construct grammatically correct and meaningful sentences using appropriate structures and transformations, and write coherent and well-organized paragraphs and essays with logical development of ideas. • Compose formal and informal letters using appropriate tone, format, and style, and prepare structured and concise reports for academic and professional purposes, and write effective and context-appropriate emails and social media messages using clarity and digital etiquette. Integrate reading and writing skills to express ideas logically, persuasively, and accurately across contexts.
		9	**VECD102:** Environmental Education	• Analyze historical, cultural, and industrial impacts on the environment, and explain the evolution of sustainability. • Distinguish between environmental issues at different spatial and temporal scales and evaluate pollution types and impacts. • Interpret pollution data and health standards, and assess pollution-related health risks. • Apply principles of environmental management and sustainability tools in real-world situations for decision-making and policy assessment.

		10	**CCRX107** Health and Wellness-II	• To be Updated
			CCRX108 Yoga Education-II	• To be Updated
			CCRX109 Sports and Fitness-II	• To be Updated
			CCRX110 Cultural Activities-II	• To be Updated
			CCRX111 NSS-II	• To be Updated
			CCRX112 Fine/Applied/Visual/Performing Arts-II	• To be Updated
		Semester III		
		1	**ZOOC201:** Animal Physiology and Ecology	• Explain the cellular and molecular mechanisms underlying physiological processes in animals. • Integrate knowledge of animal physiology to understand how physiological systems work together to maintain homeostasis. • Explain ecosystem processes and the roles of animals in ecosystem functioning. • Recognize the importance of conservation efforts and identify strategies for the protection of animal species and their habitats.
		2	**ZOOC202:** Biology in Ayurveda	• Demonstrate a comprehensive understanding of the scope of Ayurveda in its significance in Human life. • Discuss the Biological and health perspectives on human life as presented in Ayurveda. • Describe key Ayurvedic concepts, including Dravyaguna, Pachan, and dietary principles. • Differentiate between various Ayurvedic treatments and evaluate their application in modern contexts.
		3	**ZOOC203:** Lab Activities on ZOOC201	• Proficient to measure and analyze physiological and ecological parameters in animals. • Apply ecological principles to study and understand the distribution, behavior,

					and interactions of animal populations in natural habitats. • Develop the ability to collect, analyze, and interpret data from physiological experiments and ecological field studies, make conclusions about the relationship between an animal's physiology and its environment.
		4	**ZOOM201:** Principle of Ecology (For other Discipline)		• Identify and critically evaluate their own beliefs, values and actions in relation to professional and societal standards of ethics and its impact on ecosystem and biosphere due to the dynamic in population. • Anticipate, analyses and evaluate natural resource issues and act on a lifestyle that conserves nature.
		5	**ZOOM202:** Lab Activities on ZOOM201 (For other Discipline)		• Integrate theoretical knowledge of animal ecology with practical, hands-on experience in the field and laboratory. • Apply population sampling techniques to assess the size, structure of animal populations.
		6	**ZOOE201:** Dairy Production & Management		• Identify the various cow and buffalo breeds. • Acquire the skills to manage a dairy farm or to start one with adequate inputs. • Explain the various techniques of processing milk. • Prepare the various Indian traditional milk products.
		7	**ZOOV201:** Apiculture		• Establish and manage beehives effectively, utilizing best practices for colony management, hive inspections, and maintenance throughout the year. • Identify various species of bees and understand the biology, behavior, and life cycle of honeybees, including queen, worker, and drone roles within a colony. • Explore the entrepreneurial opportunities in apiculture.
		8	**AECL201:** श्रवण आणि संभाषण कौशल्ये		• To be Updated
		9	**ZOOF204:** Field Project		• Participate in the projects in industries during his or her industrial training.

				• Describe use of advanced tools and techniques encountered during industrial training and visit. • Interact with industrial personnel and follow the practices and discipline prescribed in industry or field. • Develop awareness about general workplace behavior and build interpersonal and team skills. • Prepare professional work reports and presentations.
		10	**CCRX201** Health and Wellness-III	• To be Updated
			CCRX202 Yoga Education-III	• To be Updated
			CCRX203 Sports and Fitness-III	• To be Updated
			CCRX204 Cultural Activities-III	• To be Updated
			CCRX205 NSS-III	• To be Updated
			CCRX206 Fine/Applied/Visual/Performing Arts-III	• To be Updated
		Semester IV		
		1	**ZOOC205:** Genetics & Evolutionary Biology	• Explain the molecular mechanisms of DNA replication, transcription, and translation. • Recognize the sources and significance of genetic variation within populations. • Construct and interpret phylogenetic trees to illustrate evolutionary relationships among organisms. • Apply critical thinking skills to evaluate scientific evidence, analyze evolutionary concepts, and synthesize information to answer complex questions.
		2	**ZOOC206:** Microbiology	• Identify the different types of microorganisms. • Explain the various isolation and identification of microorganisms. • Describe the environmental and nutritional factors affecting the growth of microbes. • Gain knowledge on tools and techniques used in Microbiology fundamental and

					applied studies.
		3	**ZOOC207:** Lab Activities on ZOOC205	• Recognize the sources and significance of genetic variation within populations. • Analyze allele frequencies and predict evolutionary changes in populations based on experimental data. • Apply the principles of natural selection, genetic drift, mutation, and gene flow in laboratory experiments to observe and understand their effects on genetic variation and evolution in populations. • Apply concepts from evolutionary developmental biology (evo-devo), exploring how changes in developmental processes can lead to evolutionary novelties and species diversification.
		4	**ZOOM203:** Fundamentals of Cell Biology (For other Discipline)	• Differentiate plant cell, animal cell and compare their properties. • Explain the structure and functions of various cell organelles and the process of cell division. • Identify and draw diagrams of cell organelles and analyze their functions. • Review the process of apoptosis, cell cycle, characteristics of cancerous cells.
		5	**ZOOM204:** Lab Activities on ZOOM203 (For other Discipline)	• Accurately prepare and stain cell samples for analysis under the microscope. • Identify and describe different stages of mitosis and meiosis. • Identify and describe key cellular components, including the nucleus, mitochondria, endoplasmic reticulum, Golgi apparatus, and plasma membrane.
		6	**ZOOE202:** Nutrition, Health & Hygiene	• Explain the importance of food and nutrition in public health. • Assess the impact of policies on health and hygiene, Health measures to consider while travelling. • Disaster management and responsiveness of public in pandemic and epidemic diseases. • Develop the ability to assess individual and community health needs, identify potential risks, and suggest practical

				solutions related to nutrition and hygiene.
		7	**SECS201:** Intellectual Property Rights (IPR)	• Compare and contrast different forms of IPR and their roles in protecting innovation. • Apply the knowledge of copyright and patent laws to real-world creative and inventive works. • Interpret the provisions of Indian IPR legislation and evaluate landmark case laws. • Demonstrate the ability to draft and file basic patent applications and understand prosecution procedures. • Identify and explain specialized areas of IPR, including geographical indications, plant varieties, and biodiversity protection.
		8	**AECL202:** वाचन आणि लेखन कौशल्ये	• To be Updated
		9	**ZOOG208** Awareness of Sustainable Development Goals-I	• To be Updated
		10	**CCRX207** Health and Wellness-IV	• To be Updated
			CCRX208 Yoga Education-IV	• To be Updated
			CCRX209 Sports and Fitness-IV	• To be Updated
			CCRX210 Cultural Activities-IV	• To be Updated
			CCRX211 NSS-IV	• To be Updated
			CCRX212 Fine/Applied/Visual/Performing Arts-IV	• To be Updated
		Semester V		
		1	**ZOOC301:** Mammalian Histology	• Describe the four primary tissue types found in humans. • Describe and evaluate quality, information, interactions, and localization of the visible tissue structures in histological slides.

					• Understand common histology procedures such as embedding tissue in paraffin, tissue sectioning and mounting, or routine staining of tissue sections. • Identify cellular structures within a prepared tissue slide using the most appropriate magnification for the structure • Record histological specimens, and obtain, assess, classify, and compare information from the latest special literature.
			2	**ZOOC302:** Marine Ecology	• Describe the different ecological features of marine ecosystems in relation to the biotic and abiotic characteristics. • Assess impact of climate change, globalization and human action on the marine environment. • Describe fundamental ecological processes in marine systems, including energy flow, nutrient cycling.
			3	**ZOOC303:** Lab Activities on ZOOC301	• Describe the four primary tissue types found in humans • Describe and evaluate quality, information, interactions, and localization of the visible tissue structures in histological slides. • Explain common histology procedures such as embedding tissue in paraffin, tissue sectioning and mounting, or routine staining of tissue sections. • Identify cellular structures within a prepared tissue slide using the most appropriate magnification for the structure.
			4	**ZOOC304:** Techniques in Medical Forensic Zoology	• State the basics principles of medical and Forensic Zoology. • Apply modern tools, techniques and gain skills in forensic investigations. • Explain advancements in the field of Medical Forensic Zoology.
			5	**ZOOC305:** Apiculture & Sericulture	• Acquire knowledge about different species and casts of the honey bees. • Aware about economic importance of honey bees. • Use Apiculture & Sericulture techniques for employment, self-employment and conservation of nature.

					• Apply knowledge and techniques for setting up sericulture unit.
		6	**ZOOC306:** Wildlife Conservation		• Describe biodiversity, including its importance, patterns and drivers of change. • Identify and analyze the various threats to wildlife population, including habitat loss, climate change. • Interpret about the current status of wild life conservation in India and importance of coexistence and conservation of bio-diversity and create awareness about wildlife protection • Explain different conservation strategies and techniques, including protected area management, habitat restoration, captive breeding and community-based conservation approaches.
		7	**ZOOM301:** Introduction to Aquatic Biology (For other Discipline)		• Describe the characteristics, types, and functions of various aquatic ecosystems, including freshwater, marine, and estuarine environments. • Explain how aquatic organisms are physiologically adapted to their environments. • Assess the effects of human activities such as pollution, habitat destruction, and on aquatic environments and biodiversity.
		8	**ZOOM302:** Lab Activities on ZOOM301 (For other Discipline)		• Conduct fieldwork to sample various aquatic environments (e.g., Freshwater, Marine, estuarine). • Measure key water quality indicators such as Turbidity, Alkalinity, Carbon dioxide, pH, using laboratory instruments. • Organize and analyse ecological data collected during field trips and laboratory exercises.
		9	**ZOOV301:** Aquarium Management		• Demonstrate proficiency in aquarium set-up and maintenance. • Identify a range of aquarium fish species, understand their specific care requirements, and determine the compatibility of different species within the same tank.

				• Gain the ability to measure and adjust key quality parameters to optimize fish healt prevent common aquarium issues. • Capable of designing appropriate feeding schedules and nutrition plans for different species, ensuring optimal growth, health, and longevity.
		10	**ZOOF307:** Field Project	• Participate in the projects in industries during his or her industrial training. • Describe use of advanced tools and techniques encountered during industrial training and visit. • Interact with industrial personnel and follow engineering practices and discipline prescribed in industry. • Develop awareness about general workplace behaviour and build interpersonal and team skills. • Prepare professional work reports and presentations.
		11	**ZOOG308** Awareness of Sustainable Development Goals-II	• To be Updated
		Semester VI		
		1	**ZOOC309:** Pest Management & Parasitology	• Elaborate the morphology, life cycle, pathogenicity and treatment of common parasites. • Explain the differences between continuous pests, sporadic pests, and potential pests. • Discuss & describe what is meant by prevention, suppression, and eradication of pests.
		2	**ZOOC310:** Welfare & Behaviour of Domesticated Animals	• Define animal welfare and evaluate scientific welfare assessment methods. • Demonstrate the use of scientifically proven management techniques to improve animal welfare. • Apply animal handling & stress management technique for better assessment of animals.
		3	**ZOOC311**: Lab Activities on ZOOC309	• Explain the biology, life cycles, and behavior of pests and parasites. • Apply ecological principles to understand pest and parasite interactions within ecosystems. • Develop knowledge and skills to implement integrated pest

					management strategies for sustainable pest control. • Analyze the economic impact of pests and parasites on agriculture, livestock, and public health and propose mitigation strategies.
		4	**ZOOC312:** Aquarium & Poultry Management		• Comprehend the key skills needed to set up an aquarium. • Construct an aquarium and manage fish diseases. • Identify and differentiate the different aquarium/ornamental fishes. • Use poultry skills to set an operational farm for more profit management, feed requirements. • Suggest measure for health care in Poultry. • Evaluate the economics of poultry production.
		5	**ZOOC313:** Economic Zoology		• Acquaint Knowledge of cultural techniques of different fields of Economic zoology. • Creating the self-employment opportunities to rural students through Vermiculture, goat farming and dairy industries. • Apply economic zoology concepts and techniques to address practical challenges in areas such as animal husbandry, and sustainable resource management.
		6	**ZOOC314:** Biostatistics & Bioinformatics		• Understand the Scope and role of statistics; methods and procedures of sampling; Construction of tables, charts and graphs. • Calculate central tendency and measures of dispersion and application of its knowledge on hypothesis testing as well as in problem solving. • Enumerate major biological databases and database search engines. • Perform DNA and protein sequence analysis, including sequence alignment and sequence similarity search using BLAST, FASTA, CLUSTAL W.
		7	**ZOOM303:** General Parasitology		• Describe the life cycles of key parasitic organisms, including the stages of development, transmission routes, and hosts involved in the lifecycle.

			(For other Discipline)	• Demonstrate an understanding of the factors that influence the distribution and prevalence of parasitic diseases in human and animal populations.
		8	**ZOOM304:** Lab Activities on ZOOM303 (For other Discipline)	• Identify key diagnostic features of parasites in various specimens, including characteristic body structures and motility. • Study and document the morphological features of common parasitic organisms, including size, shape, internal structures, and reproductive features.
		9	**ZOOO315:** On Job Training	• Demonstrate proficiency in applying theoretical knowledge and academic concepts to real-world professional situations. • Possess job-specific skills that are relevant to their chosen field of study, enabling them to perform tasks and responsibilities effectively and efficiently. • Acquire a comprehensive understanding of industry practices, trends, and challenges, contributing to their overall knowledge and expertise in the field. • Establish professional networks and relationships, expanding their professional connections and opportunities for future collaborations and career advancement. • Develop problem-solving and critical thinking abilities, demonstrating the ability to analyze complex situations, make informed decisions, and propose effective solutions. • Demonstrate professionalism, adaptability, and effective communication skills in a professional work environment.
		Semester VII		
		1	**ZOOC401:** Biochemistry	• Appreciate the foundation of life processes. • Explain the deep understand the structure of biomolecules. • Understand the thermodynamics of enzyme catalyzed reactions and mechanisms of energy production at cellular and molecular levels.

				• Understand the application of biochemistry.
		2	**ZOOC402**: Cell Biology	• Explain the transport across cell, nuclear membrane; bioenergetics and metabolism. • Define the composition and organization of cytoskeleton. • Enumerate and explain signaling molecules and their receptors. How the cell cycle is regulated? The students will have an idea of stem cells and its applications. • Basic principles and application of microscopy, cell culture and flow cytometry.
		3	**ZOOC403:** Applied Zoology Part-I	• Students gain knowledge and skill in the fundamentals of animal sciences, understands the complex interactions among various living organisms. • Analyse complex interactions among the various animals of different phyla, their distribution and their relationship with the environment.
		4	**ZOOC404:** Lab on Biochemistry, Cell Biology & Applied Zoology Part-I	• Frame a scientific question or problem. • Undertake investigations and perform analyses about biochemical problems. • The structures and purposes of basic components of prokaryotic and eukaryotic cells, especially macromolecules, membranes, and organelles
		5	**RESR405:** Research Methodology	• Understand some basic concepts of research and its methodologies. • Select proper method of Data collection & representation. • Select and apply appropriate statistical method for data analysis. • Do literature review, research writings with the knowledge of Intellectual Property Rights.
		6	**ZOOC406:** Developmental Biology	• Explain the molecular and genetic background of animal and plant development. • Describe evolutionary history of complex multicellular life forms. • Compare environmental influence on development and homeostasis of animals and plants.
		7	**ZOOC407:** Entomology	• To study the physiology of male and female reproductive axis and reproductive cycles.

				• To develop understanding of endocrinology of pregnancy, parturition and lactation. • To understand the interrelationship between reproduction and immunity. • To study the seasonality in reproduction.
		Semester VIII		
		1	**ZOOC409:** Molecular Biology	• Understand molecular processes viz. Replication, transcription, translation etc. • Underlying survival and propagation of life at molecular level. • Understand how genes are ultimately expressed as proteins which are responsible for the structure and function of all organisms. • Learn how four sequences (3 letter codons) generate the transcripts of life and determine the phenotypes of organisms.
		2	**ZOOC410:** Genetics	• Aware about genetic diseases, their types and causes. • Understand molecular techniques that provide improvement, diagnosis and management of these diseases. • The principles of inheritance, linkage and crossing over which lead to variations will be made clear as well as the application thereof in gene mapping.
		3	**ZOOC411:** Applied Zoology Part-II	• Understands about parasites and epidemiology of parasites in human and animals. • Use of recombinant DNA technology in genetic manipulations and in a variety of industrial processes.
		4	**ZOO412**: Lab on Molecular Biology, Genetics & Applied Zoology Part-II	• Students will demonstrate ability to use evolutionary theory and related equations to model and predict population change or stability. • The student will gain a basic understanding on human genetics and hereditary. • Students gain knowledge and skill in the fundamentals of animal sciences, understands the complex interactions among various living organisms.
		5	**ZOOO413:** On Job Training	• Students will demonstrate proficiency in applying theoretical knowledge and academic concepts to real-world professional situations.

					• Students will possess job-specific skills that are relevant to their chosen field of study, enabling them to perform tasks and responsibilities effectively and efficiently. • Students will acquire a comprehensive understanding of industry practices, trends, and challenges, contributing to their overall knowledge and expertise in the field. • Students will establish professional networks and relationships, expanding their professional connections and opportunities for future collaborations and career advancement. • Students will develop problem-solving and critical thinking abilities, demonstrating the ability to analyze complex situations, make informed decisions, and propose effective solutions. • Students will demonstrate professionalism, adaptability, and effective communication skills in a professional work environment.
			6	**ZOOC415:** Animal Biotechnology	• Understand and appreciate major public concerns and issues associated with Animal Biotechnology. • Have an understanding and grasp of international research environment where the frontiers of knowledge in Animal Biotechnology are under research. • Be able to adapt and respond positively and flexibly to changing circumstances; • Develop the professional skills and personal attributes to deal with complex issues, both systematically and creatively. • Have the capacity for individual work and teamwork. • Be lifelong learners with intellectual and practical skills.
			7	**ZOOC416:** Toxicology	• Students will demonstrate an understanding of the core concepts of the science of toxicology, including hazard identification, exposure assessment, dose-response assessment and an understanding of the

				mechanisms of action and effects of toxic chemicals at multiple levels of biological organization. • Students will demonstrate an understanding of the role for the science of toxicology in society, including the importance of risk analysis, management and communication. Students will be able to identify and discuss contemporary issues in toxicology. • Students will be familiar with technical aspects and experimental approaches in toxicological research, testing and risk assessment.

Appendix III

EVALUATION PATTERN

[CA and EE Evaluation Pattern as per the Minutes of the Meeting of the NEP Cell Dated 21.11.2023 and subsequent School Council Meetings]

SN	Type of Course	Continuous Assessment (CA)	End Examination (EE)
1.	Theory (T) **4 Credit** 100 Marks CA: 30% EE: 70%	Each student is required to attempt total 02 (Two) "Continuous Assessments (CAs)" for each course of each Semester, as per the following details: 1. CA01: 'Continuous Assessment 01 (CA01)' on Credit 01 to Credit 04 of each course, consists of • 2 (Two) 'Short Answer Questions (SAQs)', each carrying 05 Marks, on Credit 01 and Credit 02 **and** • 1 (One) 'Long Answer Question (LAQ)' of 10 Marks, on Credit 03 and Credit 04. LAQ may consist of sub-questions. **CA01**: On Credit 01 to Credit 04, of Marks = (5x2 + 10) = **20 Marks** 2. CA02: 'Continuous Assessment 02 (CA02)' on Credit 01 to Credit 04 of each course, consists of • A test containing total **10** (Ten) 'Objective Type Questions, ' 05 (Five) on Credit 01 and Credit 02, and 05 (Five) on Credit 03 and Credit 04. Each 'Objective Type Question' of 1 Mark. **CA02**: On Credit 01 to Credit 04, of Marks = **10 Marks** 3. Maximum number of attempts for **CA,** during each semester: Single attempt only 4. **Total Marks**: **30** Marks	1. Student is required to answer **05 'VSAQs' out of 06 'VSAQs'**, each carrying 03 Marks, on Credit 01 to 04, for total 15 Marks. One VSAQ will be on each Credit. 2. Student is required to answer **05 'SAQs' out of 06 'SAQs'**, each carrying 05 Marks, on Credit 01 to 04, for total 25 Marks. One SAQ will be on each Credit. 3. Student is required to answer **01 'LAQ' out of 2 LAQs,** of 10 Marks on Credit 01 and Credit 02, for total 10 Marks. LAQ may consist of sub-questions. 4. Student is required to answer **01 'LAQ' out of 2 LAQs,** of 10 Marks on Credit 03 and Credit 04, for total 10 Marks. LAQ may consist of sub-questions. 5. Student is required to answer **01 'LAQ' out of 2 LAQs,** of 10 Marks on Credit 01 to Credit 04, for total 10 Marks. LAQ may consist of sub-questions. 6. Number of attempts: Till Valid Registration Period (VRP) only 7. Marks: 70 Marks 8. Duration: 150 minutes

<table>
<tr><th>SN</th><th>Type of Course</th><th colspan="2">Continuous Assessment (CA)</th><th>End Examination (EE)</th></tr>
<tr><td></td><td></td><td colspan="3">
<table>
<tr><th>SN</th><th>Description</th><th>Evaluation of End Examination (EE)</th><th>Marks</th></tr>
<tr><td rowspan="3">1</td><td rowspan="3">Question Types</td><td>Very Short Answer Question (VSAQ) on each Credit</td><td>03 Marks</td></tr>
<tr><td>Short Answer Question (SAQ) on each Credit</td><td>05 Marks</td></tr>
<tr><td>On each Credit, either Single Long Answer Question (LAQ) or LAQ contains sub-questions (a), (b) and so on.</td><td>10 Marks</td></tr>
<tr><td>2</td><td>Grand Total Marks</td><td>Total five Questions in EE Question paper based on:
Credit 01 to 04 : 05 VSAQs out of 06 VSAQs (15 Marks)
Credit 01 to 04 : 05 SAQs out of 06 SAQs (25 Marks)
Credit 01 to 02 : 01 LAQ out of 02 LAQs (10 Marks)
Credit 03 to 04 : 01 LAQ out of 02 LAQs (10 Marks)
Credit 01 to 04 : 01 LAQ out of 02 LAQs (10 Marks)
LAQ may contains sub-questions</td><td>70 Marks</td></tr>
</table>
</td></tr>
<tr><td>2.</td><td>Theory (T)

2 Credit
50 Marks

CA: 30%
EE: 70%</td><td colspan="2">Each student is required to attempt total 01 (One) “Continuous Assessment (CA)” for each course of each Semester, as per the following details:
1. CA01: 1 (One) ‘Continuous Assessment 01 (CA01)’ on Credit 01 and Credit 02 of each course, consists of
• 1 (One) ‘Short Answer Question (SAQ)’ of 5 Marks
and
• 1 (One) ‘Long Answer Question (LAQ)’of 10 Marks, LAQ may consist of sub-questions.
CA01: On Credit 01 and Credit 02, of Marks = (5 + 10) = 15 Marks
2. Maximum number of attempts for CA, during each semester: Single attempt only
3. Total Marks: 15 Marks</td><td>1. Student is required to answer 05 ‘VSAQs’ out of 06 ‘VSAQs’, each carrying 03 Marks, on Credit 01 to 02, for total 15 Marks. One VSAQ will be on each Credit.
2. Student is required to answer 02 ‘SAQs’ out of 03 ‘SAQs’, each carrying 05 Marks, on Credit 01 to 02, for total 10 Marks. One SAQ will be on each Credit.
3. Student is required to answer 01 ‘LAQ’ out of 2 LAQs, of 10 Marks on Credit 01 and Credit 02, for total 10 Marks. LAQ may consist of sub-questions.
4. Number of attempts: Till Valid Registration Period (VRP) only
5. Marks: 35 Marks
6. Duration: 75 minutes</td></tr>
</table>

<table>
<tr><th>SN</th><th>Type of Course</th><th colspan="3">Continuous Assessment (CA)</th><th colspan="3">End Examination (EE)</th></tr>
<tr><td></td><td></td><td></td><td colspan="5"><table>
<tr><td>SN</td><td>Description</td><td>Evaluation of End Examination (EE)</td><td>Marks</td></tr>
<tr><td rowspan="3">1</td><td rowspan="3">Question Types</td><td>Very Short Answer Question (VSAQ) on each Credit</td><td>03 Marks</td></tr>
<tr><td>Short Answer Question (SAQ) on each Credit</td><td>05 Marks</td></tr>
<tr><td>On each Credit, either Single Long Answer Question (LAQ) or LAQ contains sub-questions (a), (b) and so on.</td><td>10 Marks</td></tr>
<tr><td>2</td><td>Grand Total Marks</td><td>Total three Questions in EE Question paper based on:
Credit 01 to 02: 05 VSAQs out of 06 VSAQs (15 Marks)
Credit 01 to 02: 02 SAQs out of 03 SAQs (10 Marks)
Credit 01 to 02: 01 LAQ out of 02 LAQs (10 Marks)
LAQ may contains sub-questions</td><td>35 Marks</td></tr>
</table></td></tr>
</table>

<table>
<tr><th>SN</th><th>Type of Course</th><th>Continuous Assessment (CA)</th><th>End Examination (EE)</th></tr>
<tr><td>3.</td><td>Practical (P)

4 Credit
100 Marks

CA: 50%
EE: 50%</td><td>
1. Student is required to submit “Activity Report in Work-Book Format” for each Credit in the prescribed format.
2. Maximum number of attempts for each CA, during each semester: Single attempt only
3. Marks: 50 Marks
4. Grading criteria:
<table>
<tr><td>Lab Punctuality, Preparedness & Ethics</td><td>Irregular in lab. Copies the experiment from others
(0 Points)</td><td>Consistently regular but unable to explain the concepts
(06 Points)</td><td>Punctuality in lab. Follows the procedure and responds to questions asked
(10 Points)</td></tr>
<tr><td>Activity Report and Performance

(Experiment No, Date, Objectives, Apparatus with specification, Observations, Graphs, software used if any)</td><td>Poor Documentation and copied the experiment from others.
Couldn't perform the Activity /poor observation made
(04 Points)</td><td>Average Documentation: Report is in format but some of the formatting guidelines are missed. Performed the Activity but observations made with some mistakes
(12 Points)</td><td>Good Documentation: Lab activity writing is in proper format with all references, Grammar.
Performed the Activity on time observations made with no mistakes
(20 Points)</td></tr>
<tr><td>Results and Conclusion</td><td>Unable to achieve the desired results but makes attempts to relate data to theory. Poor concluding statements
(08 Points)</td><td>Average graphical and tabulated representation with misinterpret physical significance of theory. Achieve the desired results and but insufficient conclusion statement.
(14 Points)</td><td>Analyses and interpret observed data carefully with good graphical and tabulated representation using appropriate theory/evidence. Achieve the results and reach to appropriate Conclusion
(20 Points)</td></tr>
</table>
</td><td>
External and internal examiners shall assess each student based on:
1. Workbook/Activity Report submission by the student (Only by External Examiner) [05 Marks]
2. Practical Activity performed by the student [12 Marks]
3. Result and Conclusion of the Practical Activity [13 Marks]
4. Viva-Voce on Practical Activities [20 Marks]
5. Number of attempts: Till Valid Registration Period (VRP) only
6. Marks: 50 Marks
7. Duration: 180 minutes
</td></tr>
</table>

SN	Evaluation of Practical End Examination		
	Description	Internal Examiner	External Examiner
1	Workbook/Activity Report	-	05 Marks
2	Actual Conduct of one randomly selected Practical Activity	02 Marks	10 Marks
3	Diagram, Synoptic Answers, Graph/Observation and Conclusion	03 Marks	10 Marks
4	Viva-Voce/Oral	05 Marks	15 Marks
5	Total	10 Marks	40 Marks

<table>
<tr><th>SN</th><th>Type of Course</th><th>Continuous Assessment (CA)</th><th>End Examination (EE)</th></tr>
<tr><td>4.</td><td>Practical (P)

2 Credit
50 Marks

CA: 50%
EE: 50%</td><td>
1. Student is required to submit “Activity Report in Work-Book Format” for each Credit in the prescribed format.
2. Maximum number of attempts for each CA, during each semester: Single attempt only
3. Marks: 25 Marks
4. Grading criteria:
<table>
<tr><td>Lab Punctuality, Preparedness & Ethics</td><td>Irregular in lab. Copies the experiment from others
(0 Points)</td><td>Consistently regular but unable to explain the concepts
(03 Points)</td><td>Punctuality in lab. Follows the procedure and responds to questions asked
(05 Points)</td></tr>
<tr><td>Activity Report and Performance

(Experiment No, Date, Objectives, Apparatus with specification, Observations, Graphs, software used if any)</td><td>Poor Documentation and copied the experiment from others.
Couldn’t perform the Activity /poor observation made
(02 Points)</td><td>Average Documentation: Report is in format but some of the formatting guidelines are missed. Performed the Activity but observations made with some mistakes
(06 Points)</td><td>Good Documentation: Lab activity writing is in proper format with all references, Grammar.
Performed the Activity on time observations made with no mistakes
(10 Points)</td></tr>
<tr><td>Results and Conclusion</td><td>Unable to achieve the desired results but makes attempts to relate data to theory. Poor concluding statements
(04 Points)</td><td>Average graphical and tabulated representation with misinterpret physical significance of theory. Achieve the desired results and but insufficient conclusion statement.
(07 Points)</td><td>Analyses and interpret observed data carefully with good graphical and tabulated representation using appropriate theory/evidence. Achieve the results and reach to appropriate Conclusion
(10 Points)</td></tr>
</table>
</td><td>
1. External and internal examiners shall assess each student based on:
a. Workbook/Activity Report submission by the student (Only by External Examiner) [05 Marks]
b. Practical Activity performed by the student [06 Marks]
c. Result and Conclusion of the Practical Activity[07 Marks]
d. Viva-Voce on Practical Activities [07 Marks]
2. Number of attempts: Till Valid Registration Period (VRP) only
3. Marks: 25 Marks
4. Duration: 180 minute
</td></tr>
</table>

SN	Evaluation of Practical End Examination		
	Description	Internal Examiner	External Examiner
1	Workbook/Activity Report	-	05 Marks
2	Actual Conduct of one randomly selected Practical Activity	01 Marks	05 Marks
3	Diagram, Synoptic Answers, Graph/Observation and Conclusion	02 Marks	05 Marks
4	Viva-Voce/Oral	02 Marks	05 Marks
	Total	05 Marks	20 Marks

<table>
<tr><th>SN</th><th>Type of Course</th><th>Continuous Assessment (CA)</th><th>End Examination (EE)</th></tr>
<tr><td>5.</td><td>Term Work (TW)

2 Credit
50 Marks

CA: 50%
EE: 50%

For SEC & VSC courses</td><td>1. Student is required to submit “Activity Report in Work-Book Format” for each Credit in the prescribed format.
2. Maximum number of attempts for each CA, during each semester : Single attempt only
3. Marks: 25 Marks
4. Grading Criteria:
<table>
<tr><td>Lab Punctuality, Preparedness & Ethics</td><td>Irregular in lab. Copies the experiment from others (0 Points)</td><td>Consistently regular but unable to explain the concepts (03 Points)</td><td>Punctuality in lab. Follows the procedure and responds to questions asked (05 Points)</td></tr>
<tr><td>Activity Report and Performance

(Experiment No, Date, Objectives, Apparatus with specification, Observations, Graphs, software used if any)</td><td>Poor Documentation and copied the experiment from others. Couldn't perform the Activity /poor observation made (02 Points)</td><td>Average Documentation: Report is in format but some of the formatting guidelines are missed. Performed the Activity but observations made with some mistakes (06 Points)</td><td>Good Documentation: Lab activity writing is in proper format with all references, Grammar. Performed the Activity on time observations made with no mistakes (10 Points)</td></tr>
<tr><td>Results and Conclusion</td><td>Unable to achieve the desired results but makes attempts to relate data to theory. Poor concluding statements (04 Points)</td><td>Average graphical and tabulated representation with misinterpret physical significance of theory. Achieve the desired results and but insufficient conclusion statement. (07 Points)</td><td>Analyses and interpret observed data carefully with good graphical and tabulated representation using appropriate theory/evidence. Achieve the results and reach to appropriate Conclusion (10 Points)</td></tr>
</table>
</td><td>1. External and internal examiners shall assess each student based on:
a. Workbook/Activity Report submission by the student (Only by External Examiner) [05 Marks]
b. Viva-Voce on Practical Activities [20 Marks]
2. Number of attempts: Till Valid Registration Period (VRP) only
3. Marks: 25 Marks
4. Duration: 180 minutes</td></tr>
</table>

SN	Evaluation of Practical End Examination		
	Description	Internal Examiner	External Examiner
1	Workbook/Activity Report	-	05 Marks
2	Viva-Voce/Oral	05 Marks	15 Marks
	Total	05 Marks	20 Marks

<table>
<tr><th>SN</th><th>Type of Course</th><th>Continuous Assessment (CA)</th><th>End Examination (EE)</th></tr>
<tr><td>6.</td><td>Field Project (TW)

2 Credit
50 Marks

CA: 100%</td><td>Students need to complete Field Project (Total Study hours 60 hrs including Activity Report) related to selected Major. After completion of the field project, learners shall submit a report to the LSC – Programme Coordinator (PC) and Mentor/Guide.
1. Maximum number of attempts for each CA, during each semester: Single attempt only
2. Duration: Minimum 15 days or 2 Weeks duration – Any month during the semester 3 & semester 5 of UG programme
3. Marks: 50 Marks
4. Grading Criteria for Evaluation of FP (only by Internal Examiner - Programme Coordinator (PC)/ Supervisor of LSC):
<table>
<tr><th>SN</th><th>Description</th><th>Marks</th></tr>
<tr><td>1</td><td>Key Definitions of Problem area and analysis of preliminary data</td><td>10</td></tr>
<tr><td>2</td><td>Work related to formats, Correspondence, Interactions and liaising etc</td><td>05</td></tr>
<tr><td>3</td><td>Field work and data collection, Analysis</td><td>10</td></tr>
<tr><td>4</td><td>Feedback to community</td><td>05</td></tr>
<tr><td>5</td><td>Report submission</td><td>10</td></tr>
<tr><td>6</td><td>Viva-Voce /Oral</td><td>10</td></tr>
<tr><td colspan="2">Total</td><td>50</td></tr>
</table></td><td>End Examination is Not Applicable (NA)</td></tr>
</table>

<table>
<tr><th>SN</th><th>Type of Course</th><th>Continuous Assessment (CA)</th><th>End Examination (EE)</th></tr>
<tr><td>7.</td><td>OJT or Internship (TW)

4 Credit
100 Marks

CA: 50%
EE: 50%</td><td>
1. Students need to complete one month On Job Training (OJT) or Internship related to selected Major (Total Study hours 120 hrs including Internship Report) in any Industry / Organization / Institute/ R&D Division/ Any Micro/ Small/ Medium/ enterprise/ Govt/NGO/PSU/Online Internship related to Major course.
2. Maximum number of attempts for each CA, during each semester: Single attempt only
3. Marks: 50 Marks
4. Duration: 1 Month or 4 Weeks duration – Any one month within semester duration, but before end examination of that particular semester
5. Grading Criteria for Evaluation of OJT (or Intern) only by Mentor where the Internship is proposed to be imparted:
<table>
<tr><th>SN</th><th>Parameters</th><th>Marks Out of</th></tr>
<tr><td>1</td><td>Behaviors, Shows interest in assigned work, Willingness to learn</td><td>10</td></tr>
<tr><td>2</td><td>Accepts responsibility, Cooperates with co-workers and supervisors, Demonstrates organizational skills</td><td>10</td></tr>
<tr><td>3</td><td>Uses time, knowledge and expertise effectively, Analyzes problems effectively</td><td>10</td></tr>
<tr><td>4</td><td>Demonstrates creativity/ originality / any innovative contribution, Professional ethics and accountability</td><td>10</td></tr>
<tr><td>5</td><td>Writes effectively, Produces high quality work/Skill Proficiency</td><td>10</td></tr>
<tr><td colspan="2">Total</td><td>50</td></tr>
</table>
Document as Evidence: Activity report along with Certificate or Declaration, duly issued and signed by the concerned authority [To be assessed during EE] should be submitted during End Examination to the parent Learner support Centre (LSC).
</td><td>
At the end of second semester, Programme Coordinator (PC)/ Supervisor of LSC and 1 (one) External Examiner will complete ‘End Exam (EE)’ for all allotted students as follows:
1. Duration of EE: After Theory EE of second Semester
2. Programme Coordinator (PC)/ Supervisor of LSC and External Expert will have 20% and 80% weightage respectively in EE.
3. Number of attempts: Till Valid Registration Period (VRP) only
4. Marks for EE: 50 Marks
<table>
<tr><th>Parameter</th><th>PC /Supervisor of LSC</th><th>External Expert</th></tr>
<tr><td>Professional Attitude</td><td>-</td><td>05 Marks</td></tr>
<tr><td>Maintenance of Daily Diary</td><td>-</td><td>10 Marks</td></tr>
<tr><td>Internship Report</td><td>05 Marks</td><td>10 Marks</td></tr>
<tr><td>Viva/Oral</td><td>05 Marks</td><td>15 Marks</td></tr>
<tr><td>Total</td><td>10 Marks</td><td>40 Marks</td></tr>
</table>
</td></tr>
</table>

<table>
<tr><th>SN</th><th>Type of Course</th><th>Continuous Assessment (CA)</th><th>End Examination (EE)</th></tr>
<tr><td rowspan="2">8.</td><td rowspan="2">CEP (TW)

2 Credit
50 Marks

CA: 100%</td><td>1. CEP Proposals*: 15 Marks
2. Planning community work, correspondence, formats, interactions, liaising: 10 Marks
3. CEP report**: 15 marks
4. Viva /Presentation: 10 Marks
Marks: 50 Marks</td><td>End Examination is Not Applicable (NA)</td></tr>
<tr><td colspan="2">*CEP Proposals: 1) Basic structure of Society
2) Key definitions of Problem area
3) Analysis of Preliminary data

**CEP Report: 1) Field work and data gathering
2) Analysis and reporting</td></tr>
</table>

Entry level qualification to B. Sc. (Honours) programmes

<table>
<tr><th>SN</th><th colspan="3">Academic Qualifications required for Eligibility</th></tr>
<tr><td rowspan="2">A)</td><td colspan="3">A candidate who has passed Standard 12th / (10+2)th / Level 4.0 examination conducted by Maharashtra State Board of Secondary and Higher Secondary Education/CBSE/ ISC/NIOS or equivalent examinations by any Other State or any other recognized Board with science subjects shall be eligible for admission to First Semester B. Sc. Programmes as per NEP 2020:</td></tr>
<tr><td colspan="2">Groups of Science subjects/courses from</td><td>Eligible for Any One Major in Science Discipline</td></tr>
<tr><td>1.</td><td colspan="2">1. English
2. Physics, Chemistry, Mathematics, Biology</td><td>Any One Major from: Physics, Chemistry, Mathematics, Botany, Zoology, Environmental Science</td></tr>
<tr><td>2.</td><td colspan="2">1. English
2. Physics, Chemistry, Mathematics</td><td>Any One Major from: Physics, Chemistry, Mathematics, Environmental Science</td></tr>
<tr><td>3.</td><td colspan="2">1. English
2. Physics, Chemistry, Biology</td><td>Any One Major from: Physics, Chemistry, Botany, Zoology, Environmental Science</td></tr>
<tr><td>4.</td><td colspan="2">1. English
2. Vocational Course of 200 Marks
3. Physics, Chemistry, Mathematics</td><td>Any One Major from: Physics, Chemistry, Mathematics, Environmental Science</td></tr>
<tr><td>5.</td><td colspan="2">1. English
2. Vocational Course of 200 Marks
3. Physics, Chemistry, Biology</td><td>Any One Major from: Physics, Chemistry, Botany, Zoology, Environmental Science</td></tr>
<tr><td rowspan="3">6.</td><td rowspan="3">1. English
2. Physics, Chemistry</td><td>3. Any one of the following Optional Course of 100 Marks:

Geography, Geology, Food Science and Technology, Agriculture Science and Technology, Animal Science and Technology, Defence Studies</td><td>Any One Major from: Physics, Chemistry, Environmental Science</td></tr>
<tr><td>3. Any one of the following Optional Course of 100 Marks:

Food Science and Technology, Agriculture Science</td><td>Major: Botany</td></tr>
<tr><td>3. Optional Course of 100 Marks: Animal Science and Technology</td><td>Major: Zoology</td></tr>
<tr><td colspan="4">OR</td></tr>
<tr><td rowspan="2">B)</td><td colspan="3">A candidate who has passed (10+3) years or (12+2) years Diploma from Maharashtra State Technical Board / a statutory or recognized board/ university in India</td></tr>
<tr><td colspan="2">Description</td><td>Eligible for Any One Major in Science Discipline</td></tr>
<tr><td>1.</td><td colspan="2">(10+3) years / (12+2) years Engineering Diploma</td><td>Any One Major from: Physics, Chemistry, Mathematics, Environmental Science</td></tr>
<tr><td colspan="4">OR</td></tr>
<tr><td rowspan="2">C)</td><td colspan="3">A candidate who has passed Higher Secondary School Certificate (10+2) Examination with English and any of the following +2 Level HSC Vocational (MCVC) Group</td></tr>
<tr><td colspan="2">HSC Vocational (MCVC) Group</td><td>Eligible for Any One Major in Science Discipline</td></tr>
<tr><td rowspan="2">1.</td><td rowspan="2"></td><td>Horticulture (KA, KB, KC)</td><td rowspan="2">Any One Major from:
Botany, Environmental Science</td></tr>
<tr><td>Crop Science (LA, LB, LC)</td></tr>
</table>

SN	Academic Qualifications required for Eligibility		
	Agriculture Group or Fisheries Group	Animal Husbandry and Dairy Technology (MA, MB, MC)	**Any One Major from:** **Zoology**, Environmental Science
		Fisheries Technology (NA, NB, NC)	
2.	Catering and Food Products Technology	Catering and Food Products Technology (SA, SB, SC)	**Any One Major from:** Botany, **Zoology**, Environmental Science
3.	Paramedical Group	Child, Old Age and Health care services (QA, QB, QC)	**Any One Major from:** Botany, **Zoology**, Environmental Science
		Medical Laboratory Technician (OA, OB, OC)	**Any One Major from:** Physics, Chemistry, **Zoology**
		Ophthalmic Technician (RA, RB, RC)	**Major:** Physics
		Radiology Technician (PA, PB, PC)	
4.	Technology Group	Electronics Technology (EA, EB, EC)	**Major:** Physics
		Electrical Technology (FA, FB, FC)	

END OF DOCUMENT

DEB-UGC application for Programme approval for AY 2025-26

School of Sciences, YCMOU Nashik

(Formerly School of Architecture, Science and Technology)

Programme Project Report (PPR)

UGV02: B.Sc. (Honours) (Chemistry) {2025 Pattern}

A. Programme Project Report (PPR)

Name of Programme: Bachelor of Science (Honours) (Chemistry)		
a	Programme's mission & objectives	**1. Mission:** The "Bachelor of Science (Honours)" is an innovative programme based on a number of core, elective and skill courses in Chemistry. Upon graduation, the learners will be able to understand and appreciate the impact of "Chemistry" in day-to-day life. Further, the learners will be exposed to the current trends in research about "Chemistry". The mission is to forge a solid foundation in Chemistry, empowering learners to confidently tackle and analyze complex scientific challenges with ease. This program aims to cultivate strong analytical skills to prepare learners to excel in the field of Chemistry. The program provides a comprehensive education in both theoretical and experimental skills of Chemistry. Learners will engage in hands-on laboratory activities and immersive field projects or internships, ensuring they acquire not only fundamental knowledge but also practical skills vital for success in the scientific community. **2. Objectives**: The main objectives for offering this programme, are • Access to Science Education: To provide science education opportunities through LEARNER Open and Distance Learning (ODL), making learning accessible and cost effective. • Deep Understanding: To ensure that learners gain a deep understanding of the fundamental principles and concepts in Chemistry. • Problem-Solving Abilities: To equip students with problem-solving skills, enabling them to apply scientific methodologies to address complex issues that require expertise in Chemistry discipline. • Laboratory Proficiency: To develop practical laboratory skills, enabling learner to design experiments, collect data, and analyze results in the Chemistry. • Research Aptitude: To nurture research aptitude by encouraging learner to engage in interdisciplinary research projects at the undergraduate level. • Effective Communication: To enhance communication skills, allowing learner to communicate scientific findings effectively, both in writing and orally. • Flexibility and Adaptability: To prepare learners for diverse career opportunities, including academia, research, industry, and entrepreneurship, by offering a versatile skill set. • Engage in life-long learning and will have recognition.

b	Relevance of the Programme with HEI's Mission and Goals	Objects of the YCMOU (as per the YCMOU Act) which would be fulfilled by implementing the proposed program (a) To provide through instruction, teaching and training and other educational opportunities, access to larger and larger segment of population, and in particular to the disadvantaged groups such as those living in remote and rural areas including working people, housewives and other adults who wish to upgrade or acquire knowledge through studies in various fields; [1(a)] (b) To strengthen and diversify the degrees, diploma and certificate courses at various educational levels, to fulfill the knowledge, skills and development needs of the individuals, institutions and society in general, by relating, particularly, the courses, to the needs of the employment and economic development of the state on the basis of its natural and human resources; [1(b)] (c) To promote acquisition of knowledge in a rapidly developing and changing society and to continually offer opportunity of upgrading knowledge, training and skills in the context of innovations, research and discovery in all field of human endeavour by developing educational network with the use of modern communication media and technologies appropriate for a learning society; [1(c)] (d) To provide an innovative system of University level education, flexible and open, in regard to the methods and pace of learning, combination of courses, eligibility for enrolment, age of entry, conduct of examinations and operation of the program, with a review to promote learning and encourage excellence in all fields of knowledge; [1(d)] (e) To contribute to the improvement of the education system in the state by providing a non-formal channel complementary to the formal system and encouraging transfer of credits and exchange of teaching staff by making a wide use of text and other software developed by the University; [1(e)] (f) To develop innovative, need based vocational courses and establish industry, institution linkage for developing the society; [1(f)] (g) To provide through incidental and non-formal means, for continuing and extension of education in various cultural forms, arts, crafts and skills of the country, raising their quality and improving their availability to the people; [1(g)] (h) To provide for the counseling and guidance to its learners; [1(j)] (i) To provide major part of its resources and direct efforts in designing, developing and offering need-based and relevant vocational courses. [1(l)]
c	Nature of prospective target group of learners	12th / (10+2)th / Level 4.0 examination conducted by Maharashtra State Board of Secondary and Higher Secondary Education/CBSE/ ISC/NIOS or equivalent examinations by any Other State or any other recognized Board with Science Subjects Pass, including English and Chemistry OR (10+3) years or (12+2) years Engineering Diploma Pass, from Maharashtra State Technical Board / a statutory or recognized board/ university in India OR Higher Secondary School Certificate (10+2) Examination with English and the following +2 Level HSC Vocational (MCVC) Group:

		Medical Laboratory Technician (OA, OB, OC) Pass Although similar UG Programme are offered by conventional institutes, the conventional educational system offers very little freedom to learners as regards when, where, and how to learn. The proposed programme aims to provide this freedom to learners to the maximum possible extent.
d	Appropriateness of programme to be conducted in Open and Distance Learning mode to acquire specific skills and competence Specify the expected learning outcomes in terms of: 1. Knowledge Attainment: 2. Skills and Competencies: Compliances of academic, professional & occupational standards:	The proposed programme is designed in adherence to the principles of National Education Policy (NEP2020) to acquire knowledge and skills with valuable experiences through VSC, SEC, AEC, VEC, IKS, hands-on activities, projects, internships and much more. This aims to provide relevant skills as needed by the working professional to identify and solve challenging problems in Chemistry, thus contributing to the ever-increasing demands of society and industry. The programme helps to develop scientific tempers and attitudes, which in turn can prove beneficial for society since scientific developments can make a nation or society grow at a rapid pace. After studying this programme, learners will be better equipped to learn and have a deep understanding of key Chemistry concepts, principles and theories relevant to the field of Chemistry, analyze Chemistry formulae and are prepared to take on leadership roles in Chemistry, governmental agencies, research institutions and industries related to Chemistry. This programme uses the Open and Distance (ODL) mode of education in compliance with the objective 'reach to unreach' by offering: Theory, Practical, Term-work, Field Project/OJT, courses. The teaching-learning component is offered as face-to-face counseling along with full practical and project-work activities by qualified and experienced teacher/ mentors/experts at a recognized Learner Support Center (LSC), along with continuous assessment, and offline materials and resources in printed book format or soft copy format. The UGC recently introduced a 'virtual laboratory' approach for practical courses. This university is currently working on implementing this for the proposed laboratory activities in science courses. Additionally, this programme adheres all of the prevalent academic norms and standards of the UGC-DEB. Hence, this programme is appropriate to conduct in open and distance learning modes to provide an opportunity for those aspirants who cannot take traditional education but want to improve their existing science skills and/or to acquire specified skills and competencies.
e	Instructional Design **1.** Curriculum Design **(*Outcome of Expert Committee meeting; Program Structure: specify the***	This B.Sc. (Honours) programme for undergraduates is well structured based on the NEP 2020 framework. The entire curriculum is well organized and thoughtfully designed, featuring an updated syllabus. The four-year B.Sc. (Honours) program consists of 176 credits distributed over eight semesters, with learners required to complete 22 credits in each semester. The modular structure of the curriculum allows for multiple entry and exit options. After successfully completion of 1 to 6 semesters, learners will be awarded a three-year Bachelor of Science (B.Sc.) degree with 132 credits. These credits will be distributed among Major Courses (DSC & DEC)), Minor courses, Open Electives (OEs), Ability Enhancement Courses (AEC), Skill Enhancement Courses (SEC), Value Education Courses (VEC), Indian Knowledge System (IKS), On Job Training (OJT), Field projects (FP), Co-curricular Courses (CC), Research Methodology (RM) etc.

***theory, practical, fieldwork, project, etc components*):**

2. Total Credit Points (*including course wise*):
3. Detailed Syllabi:
4. Duration of the program **(*Minimum & Maximum*):**
5. Medium of Instruction:
6. Type of Program **(*General/Technical/ Professional*):**
7. Faculty and Support Staff:
8. Instructional Design & Delivery Mechanism **(*Media to be used - print, audio, video, online,***

Among all offered courses, learners have to opt the courses as per NEP2020 guidelines.

Semester pattern: This programme is of total 8 semesters. Distribution of the credits are as follows :

Sem	Mandatory Courses (DSC)				Elective Courses (DSE) (4 CR)	Minor Courses (2CR)		Open Elective OE (2CR)	VSC, SEC (VSEC) (2CR)		AEC, VEC, IKS (2CR)	OJT, FP, CEP, CC (2/4 CR)	Total Courses (CR)
	Theory (T)		Practical (P)										
	4 CR	2 CR	4 CR	2 CR		T	P	T	T	TW/ P	T	TW	
I	1	-	-	1	-	-	-	2	-	2	3	CC (2CR)	10 (22 CR)
II	1	-	-	1	-	1	-	2	-	2	2	CC (2CR)	10 (22 CR)
CumCr.	12				00	02		08	08		10	04	44
Exit option: Award of UG Certificate in Faculty of Science – Chemistry (Level 4.5) as Major with 44 credits and an additional 4 credits core NSQF course/ Internship OR Continue with Major and Minor													
III	1	1	-	1	-	1	1	1	-	1	1 (2CR)	FP (2 CR) CC (2CR)	10 (22 CR)
IV	1	1	-	1	-	1	1	1	1	-	1 (2CR)	CEP (2 CR) CC (2CR)	10 (22 CR)
CumCr.	28				00	10		12	12		14	12	88
Exit option: Award of UG Diploma in Faculty of Science – Chemistry (Level 5.0) with 88 credits and an additional 4 credits core NSQF course/ Internship OR Continue with Major and Minor													
V	1	1	1	-	1	1	1	-	-	1	-	FP/ CEP (2 CR)	8 (22 CR)
VI	1	1	1	-	1	1	1	-	-	-	-	OJT (4CR)	7 (22 CR)
CumCr.	48				08	18		12	14		14	18	132
Exit option: Award of UG Degree in Chemistry (Level 5.5) as Major with 132 credits OR Continue with Major and Minor													
VII	2	1	1	-	1	1 (4CR)		-	-		-	-	6 (22 CR)
VIII	2	1	1	-	1	-		-	-		-	OJT (4CR)	6 (22 CR)
CumCr.	76				16	22		12	14		14	22	176
Four Year UG Honours Degree in Major in Chemistry and Minor in xxx with 176 credits													

Programme Structure:

SN	Course	Code	Name	CA	EE	TM	Type	CR	Min%
[Level 4.5] Semester I: 22 Credits									
01	DSC	CHEC101	Basic Inorganic & Organic Chemistry	30	70	100	T	4	40%
02	DSC	CHEC102	Lab Activities on CHEC101	25	25	50	P	2	40%
03	OE	XXXE101	Select from other faculty OE courses List	15	35	50	T	2	40%
04	OE	XXXE102	Select from other faculty OE courses List	15	35	50	T	2	40%
05	VSC	CHEV101	Food Chemistry	25	25	50	TW	2	40%
06	SEC	SECS101	Basic Instrumentation Skills	25	25	50	TW	2	40%
07	AEC	AECL101	Listening and Speaking Skills in English	15	35	50	T	2	40%

computer aided, web based, etc. (course wise)):

Student Support Service System ***(Specify the provisions to be made at Head Quarter, Regional Centers, Learner Support Centers and Web based, etc):***

08	VEC	VECD101	Introduction to the Constitution of India	15	35	50	T	2	40%
Select Any One from IKSK101 to IKSK105									
09	IKS	IKSK101	भारतीय ज्ञान परंपरा – कला आणि प्राचीन भारतीय भाषा	15	35	50	T	2	40%
		IKSK102	भारतीय ज्ञान परंपरा – सामाजिक शास्त्रे	15	35	50	T	2	40%
		IKSK103	भारतीय ज्ञान परंपरा – आरोग्य शास्त्र	15	35	50	T	2	40%
		IKSK104	भारतीय ज्ञान परंपरा – विज्ञान आणि तंत्रज्ञान	15	35	50	T	2	40%
		IKSK105	Indian Knowledge System – Generic (Offered in Online Mode)	15	35	50	T	2	40%
Select Any One from CCRX101 to CCRX106									
10	CC	CCRX101	Health and Wellness-I	50	-	50	TW	2	40%
		CCRX102	Yoga Education-I	50	-	50	TW	2	40%
		CCRX103	Sports and Fitness-I	50	-	50	TW	2	40%
		CCRX104	Cultural Activities-I	50	-	50	TW	2	40%
		CCRX105	NSS-I	50	-	50	TW	2	40%
		CCRX106	Fine/Applied/Visual/Performing Arts-I	50	-	50	TW	2	40%
[Level 4.5] Semester II : 22 Credits									
11	DSC	CHEC103	Physical & Organic Chemistry	30	70	100	T	4	40%
12	DSC	CHEC104	Lab Activities on CHEC103	25	25	50	P	2	40%
13	Minor	XXXM101	To be Selected from Minor Courses List **other than Major (DSC)**	15	35	50	T	2	40%
14	OE	XXXE103	Select from other faculty OE courses List	15	35	50	T	2	40%
15	OE	XXXE104	Select from other faculty OE courses List	15	35	50	T	2	40%
16	VSC	CHEV102	Chemistry of Biomolecules	25	25	50	TW	2	40%
17	SEC	SECS102	MS-Excel with AI	25	25	50	TW	2	40%
18	AEC	AECL102	Reading and Writing Skills in English	15	35	50	T	2	40%
19	VSC	VECD102	Environmental Education	15	35	50	T	2	40%
Select Any One from CCRX107 to CCRX112									
20	CC	CCRX107	Health and Wellness-II	50	-	50	TW	2	40%
		CCRX108	Yoga Education-II	50	-	50	TW	2	40%
		CCRX109	Sports and Fitness-II	50	-	50	TW	2	40%
		CCRX110	Cultural Activities-II	50	-	50	TW	2	40%

	CCRX111	NSS-II	50	-	50	TW	2	40%
	CCRX112	Fine/Applied/Visual/Performing Arts-II	50	-	50	TW	2	40%
Exit option: Award of UG Certificate in The Faculty of Science- Chemistry (Level 4.5) with 44 credits and an additional 4 credits core NSQF course/ Internship OR Continue with Major and Minor								
[Level 5.0] Semester III: 22 Credits								
21	DSC	CHEC201	Advanced Physical & Organic Chemistry	30	70	100	T	4	40%
22	DSC	CHEC202	Ancient Indian Chemistry	15	35	50	T	2	40%
23	DSC	CHEC203	Lab Activities on CHEC201	25	25	50	P	2	40%
24	Minor	XXXM201	To be Selected from Minor Courses List **other than Major (DSC)**	15	35	50	T	2	40%
25	Minor	XXXM202	To be Selected from Minor Courses List **other than Major (DSC)**	25	25	50	P	2	40%
26	OE	XXXE201	Select from other faculty OE courses List	15	35	50	T	2	40%
27	VSC	CHEV201	Introduction to Medicinal Chemistry	25	25	50	P	2	40%
28	AEC	AECL201	श्रवण आणि संभाषण कौशल्ये	15	35	50	T	2	40%
29	FP	CHEF204	Field Project	50	-	50	TW	2	40%
Select from List CCRX201 to CCRX206									
30	CC	CCRX201	Health and Wellness-III	50	-	50	TW	2	40%
		CCRX202	Yoga Education-III	50	-	50	TW	2	40%
		CCRX203	Sports and Fitness-III	50	-	50	TW	2	40%
		CCRX204	Cultural Activities-III	50	-	50	TW	2	40%
		CCRX205	NSS-III	50	-	50	TW	2	40%
		CCRX206	Fine/Applied/Visual/Performing Arts-III	50	-	50	TW	2	40%
[Level 5.0] Semester IV: 22 Credits									
31	DSC	CHEC205	Basic Analytical Chemistry	30	70	100	T	4	40%
32	DSC	CHEC206	Molecular Modeling Chemistry	15	35	50	T	2	40%
33	DSC	CHEC207	Lab Activities on CHEC205 and CHEC206	25	25	50	P	2	40%
34	Minor	XXXM203	To be Selected from Minor Courses List **other than Major (DSC)**	15	35	50	T	2	40%
35	Minor	XXXM204	To be Selected from Minor Courses List **other than Major (DSC)**	25	25	50	P	2	40%
36	OE	XXXE202	Select from other faculty OE courses List	15	35	50	T	2	40%
37	SEC	SECS201	Intellectual Property Rights	15	35	50	T	2	40%
38	AEC	AECL201	वाचन आणि लेखन कौशल्ये	15	35	50	T	2	40%

39	CEP	CHEG208	Awareness of Sustainable Development Goals-I	50	-	50	TW	2	40%
Select from List CCRX207 to CCRX212									
40	CC	CCRX207	Health and Wellness-IV	50	-	50	TW	2	40%
		CCRX208	Yoga Education-IV	50	-	50	TW	2	40%
		CCRX209	Sports and Fitness-IV	50	-	50	TW	2	40%
		CCRX210	Cultural Activities-IV	50	-	50	TW	2	40%
		CCRX211	NSS-IV	50	-	50	TW	2	40%
		CCRX212	Fine/Applied/Visual/Performing Arts-IV	50	-	50	TW	2	40%
Exit option: Award of UG Diploma in in the Faculty of Science-Chemistry (Level 5.0) with 88 credits and an additional 4 credits core NSQF course/ Internship OR Continue with Major and Minor									
[Level 5.5] Semester V: 22 Credits									
41	DSC	CHEC301	Physical & Inorganic Chemistry	30	70	100	T	4	40%
42	DSC	CHEC302	Industrial Chemistry - I	15	35	50	T	2	40%
43	DSC	CHEC303	Lab Activities on CHEC301 & CHEC302	50	50	100	P	4	40%
Select Any One from CHEC304, CHEC305, CHEC306									
44	DSE	CHEC304	Chemistry in Everyday life	30	70	100	T	4	40%
	DSE	CHEC305	Biochemistry	30	70	100	T	4	40%
	DSE	CHEC306	Co-ordination Chemistry	30	70	100	T	4	40%
45	Minor	XXXM301	To be Selected from Minor Courses List **other than Major (DSC)**	15	35	50	T	2	40%
46	Minor	XXXM302	To be Selected from Minor Courses List **other than Major (DSC)**	25	25	50	P	2	40%
47	VSC	CHEV301	Chemistry of Soils and Agrochemicals	25	25	50	P	2	40%
Select CHEF307 or CHEG308									
48	FP	CHEF307	Field Project	50	-	50	TW	2	40%
	CEP	CHEG308	Awareness of Sustainable Development Goals-II	50	-	50	TW	2	40%
[Level 5.5] Semester VI: 22 Credits									
49	DSC	CHEC309	Green Chemistry	30	70	100	T	4	40%
50	DSC	CHEC310	Industrial Chemistry-II	15	35	50	T	2	40%
51	DSC	CHEC311	Lab Activities on CHEC309 & CHEC310	50	50	100	P	4	40%
Select Any One from CHEC312, CHEC313, CHEC314									
52	DSE	CHEC312	Advanced Agrochemicals, Bio-pesticides & Fertilizers	30	70	100	T	4	40%
	DSE	CHEC313	Forensic Chemistry	30	70	100	T	4	40%
	DSE	CHEC314	Application of Computer in Chemistry	30	70	100	T	4	40%

53	Minor	XXXM303	To be Selected from Minor Courses List **other than Major (DSC)**	15	35	50	T	2	40%
54	Minor	XXXM304	To be Selected from Minor Courses List **other than Major (DSC)**	25	25	50	P	2	40%
55	OJT	CHEO315	On Job Training	50	50	100	TW	4	40%
Exit option: Award of UG Degree in Chemistry (Level 5.5) with 132 credits OR Continue with Major and Minor									
[Level 6.0] Semester VII: 22 Credits									
56	DSC	CHEC401	Inorganic Chemistry-I	30	70	100	T	4	40%
57	DSC	CHEC402	Physical Chemistry-I	30	70	100	T	4	40%
58	DSC	CHEC403	Organic Chemistry-I	15	35	50	T	2	40%
59	DSC	CHEC404	Lab Activities on CHEC401, CHEC402 & CHEC403	50	50	100	P	4	40%
60	RM	RESR405	Research Methodology	30	70	100	T	4	40%
Select Any One from CHEC406, CHEC407									
61	DSE	CHEC406	Physical Methods in Chemistry	30	70	100	T	4	40%
	DSE	CHEC407	Polymer Chemistry	30	70	100	T	4	40%
[Level 6.0] Semester VIII									
62	DSC	CHEC409	Inorganic Chemistry-II	30	70	100	T	4	40%
63	DSC	CHEC410	Physical Chemistry-II	30	70	100	T	4	40%
64	DSC	CHEC411	Organic Chemistry-II	15	35	50	T	2	40%
65	DSC	CHEC412	Lab Activities on CHEC409, CHEC410 & CHEC411	50	50	100	P	4	40%
66	OJT	CHEO413	On Job Training	50	50	100	TW	4	40%
Select Any One from CHEC415, CHEC416									
67	DSE	CHEC415	Analytical Chemistry	30	70	100	T	4	40%
	DSE	CHEC416	Chemical Mathematics & Biostatistics	30	70	100	T	4	40%
Four Year UG Honours Degree in Chemistry and XXX as Minor with 176 Credits									

Minor Courses offered in Chemistry discipline for other discipline of same faculty or different faculty :

- These minor courses may be selected by learners who have not selected Chemistry as Major:

SN	Course	Code	Name	CA	EE	TM	Type	CR	Min%
Semester II									
01	Minor	CHEM101	Basic of Physical Chemistry	15	35	50	T	2	40%
Semester III									
02	Minor	CHEM201	Introduction to Organic Chemistry	15	35	50	T	2	40%
03	Minor	CHEM202	Lab Activities on CHEM201	25	25	50	P	2	40%

Semester IV									
04	Minor	CHEM203	Introduction to Inorganic Chemistry	15	35	50	T	2	40%
05	Minor	CHEM204	Lab Activities on CHEM203	25	25	50	P	2	40%
Semester V									
06	Minor	CHEM301	Advanced Physical Chemistry	15	35	50	T	2	40%
07	Minor	CHEM302	Lab Activities on CHEM301	25	25	50	P	2	40%
Semester VI									
08	Minor	CHEM303	Introduction to Organic and Inorganic Chemistry	15	35	50	T	2	40%
09	Minor	CHEM304	Lab Activities on CHEM303	25	25	50	P	2	40%

- Chemistry learners may select minor courses from the following discipline:

SN	**Major in**	Minor in **(Anyone of the following other than Major):** Refer Appendix I
1	Chemistry	Physics, Mathematics, Botany, Zoology, Environmental Science

Open Elective (OE) Courses in Chemistry offered for other Faculty:

SN	Course	Code	Name	CA	EE	TM	Type	CR	Min%
Semester I									
1	OE	CHEE101	Chemistry in Everyday Life	15	35	50	T	2	40%
2	OE	CHEE102	Industrial Safety Management	15	35	50	T	2	40%
Semester II									
3	OE	CHEE103	Pesticides Chemistry	15	35	50	T	2	40%
4	OE	CHEE104	Food Safety Adulteration & Detection	15	35	50	T	2	40%
Semester III									
5	OE	CHEE201	Fuel Chemistry	15	35	50	T	2	40%
Semester IV									
6	OE	CHEE202	Chemistry of Cosmetics	15	35	50	T	2	40%

Total Credits: **132** and **Total Courses**: **55** {3Y UG degree}
Total Credits: **176** and **Total Courses**:**67** {4Y UG degree}

- **Detailed Syllabi:** Available at https://drive.google.com/drive/folders/13lNyj1PT7qN-AAAi2eE8fwDAsCQFWMQz?tid=0B451Yjwt_acQR1VPSUQ4Qotvams
- Programme Outcomes and Courses Outcomes: Refer **Annexure – II**

Minimum programme duration:

- 3 yrs {for 3Y UG degree} and 4 yrs {4Y UG (Honours) degree}

Maximum Programme Duration:

- 6 yrs {for 3Y UG degree} and 8 yrs {4Y UG (Honours) degree}

Medium of Instruction: English

Type of Program: General

Faculty and Support Staff:

Director, School of Sciences: Prof. Chetana Kamlaskar
Academic coordinator: Dr. Dnyaneshwar I. Bhusanur

Academic coordinator: Ms. Harshada B. Godse

Instructional Design & Delivery Mechanism :

In order to ensure and maintain the quality in science education, face-to-face counseling for theory and activities type of courses will be conducted at the designated LSCs during Saturdays and Sundays.

- **Minimum number of face-to-face counseling sessions: 12 (for 4 Credits)**

  - (For each theory type of course of 4 credits duration of each counseling session shall be 01 Clock Hour)

  - (For each Practical/Project type of course of 4 credits duration of each counseling session shall be 02 Clock Hour).

- **Minimum number of face-to-face counseling sessions: 6 (for 2 Credits)**

  - (For each theory type of course of 2 credits duration of each counseling session shall be 01 Clock Hour)

  - (For each Practical/Termwork type of course of 2 credits duration of each counseling session shall be 02 Clock Hour).

- **Number of On Job Training (OJT) hours:** 120 hr (for 4 Credits)
  - One month 'On Job Training (OJT)' or Internship (Total Study hours 120 hrs including Internship Report)

- **Required study efforts**:
  1. For 3Y UG degree: Total 3960 Hours including Self-Study during all 06 semesters. 660 Hours (including Self-Study) during each semester.
  2. For 4Y UG (Honours) degree: Total **5280** Hours including Self-Study during all 08 semesters. 660 Hours (including Self-Study) during each semester.

- **Attendance**: Minimum 80% attendance recommended for all activity type of courses

- **eBook**: eBook in SLM format for each course (Free Download from University website) at all semesters I to semester VIII

Student Support Service System:

At headquarter: Support from School, SSD, Evaluation Division and Exam Unit-3

At Regional Centers: From all 8 regional centers within MH

<table>
<tr><td></td><td></td><td>At Learner Support Centers: Recognized Learner support centers within MH
Web Based:
http://www.ycmou.ac.in
http://ycmou.digitaluniversity.ac</td></tr>
<tr><td>f</td><td>Procedure for admissions, curriculum transaction and evaluation
1. Define the Admission Policy (including web based tools to be adopted:
2. Eligibility Criteria:
3. Fee Structure:
4. Financial assistance to Learners (if any):
5. Activity planner of all academ</td><td>All information related to the programme like admission policy, eligibility and fee structure, course curriculum, medium of instruction, evaluation policy - online home assignments and end examination pattern, SLMs etc. are transacted through prospectus, university website and official notification.
Admissions procedure: A customized “Online Annual Admission system” available at DU portal
http://ycmou.digitaluniveristy.ac
Online payment facility is made available using a credit card or debit card or internet banking.
Admission Eligibility: Entry level qualification to B. Sc. (Honours) programmes
<table>
<tr><th>SN</th><th colspan="3">Academic Qualifications required for Eligibility</th></tr>
<tr><td>A)</td><td colspan="3">A candidate who has passed Standard 12th / (10+2)th / Level 4.0 examination conducted by Maharashtra State Board of Secondary and Higher Secondary Education/CBSE/ ISC/NIOS or equivalent examinations by any Other State or any other recognized Board with science subjects shall be eligible for admission to First Semester B. Sc. Programmes as per NEP 2020:</td></tr>
<tr><td></td><td colspan="2">Groups of Science subjects/courses from</td><td>Eligible for Any One Major in Science Discipline</td></tr>
<tr><td>1.</td><td colspan="2">1. English
2. Physics, Chemistry, Mathematics, Biology</td><td>Any One Major from: Physics, Chemistry, Mathematics, Botany, Zoology, Environmental Science</td></tr>
<tr><td>2.</td><td colspan="2">1. English
2. Physics, Chemistry, Mathematics</td><td>Any One Major from: Physics, Chemistry, Mathematics, Environmental Science</td></tr>
<tr><td>3.</td><td colspan="2">1. English
2. Physics, Chemistry, Biology</td><td>Any One Major from: Physics, Chemistry, Botany, Zoology, Environmental Science</td></tr>
<tr><td>4.</td><td colspan="2">1. English
2. Vocational Course of 200 Marks
3. Physics, Chemistry, Mathematics</td><td>Any One Major from: Physics, Chemistry, Mathematics, Environmental Science</td></tr>
<tr><td>5.</td><td colspan="2">1. English
2. Vocational Course of 200 Marks
3. Physics, Chemistry, Biology</td><td>Any One Major from: Physics, Chemistry, Botany, Zoology, Environmental Science</td></tr>
<tr><td rowspan="3">6.</td><td rowspan="3">1. English
2. Physics, Chemistry</td><td>3. Any one of the following Optional Course of 100 Marks:

Geography, Geology, Food Science and Technology, Agriculture Science and Technology, Animal Science and Technology, Defence Studies</td><td>Any One Major from: Physics, Chemistry, Environmental Science</td></tr>
<tr><td>3. Any one of the following Optional Course of 100 Marks:

Food Science and Technology, Agriculture Science</td><td>Major: Botany</td></tr>
<tr><td>3. Optional Course of 100 Marks:
Animal Science and</td><td>Major: Zoology</td></tr>
</table>
</td></tr>
</table>

ic activities of the academic session:

6. Exit Option- UG Certificate UG Diploma, UG Degree:

Policy for Evaluation of learner progress along with methods and tools:

		Technology	
OR			
B)	A candidate who has passed (10+3) years or (12+2) years Diploma from Maharashtra State Technical Board / a statutory or recognized board/ university in India		
	Description		**Eligible for Any One Major in Science Discipline**
1.	(10+3) years / (12+2) years Engineering Diploma		**Any One Major from:** Physics, **Chemistry,** Mathematics, Environmental Science
OR			
C)	A candidate who has passed Higher Secondary School Certificate (10+2) Examination with English and any of the following +2 Level HSC Vocational (MCVC) Group		
	HSC Vocational (MCVC) Group		**Eligible for Any One Major in Science Discipline**
1.	Agriculture Group or Fisheries Group	Horticulture (KA, KB, KC)	**Any One Major from:** Botany, Environmental Science
		Crop Science (LA, LB, LC)	
		Animal Husbandry and Dairy Technology (MA, MB, MC)	**Any One Major from:** Zoology, Environmental Science
		Fisheries Technology (NA, NB, NC)	
2.	Catering and Food Products Technology	Catering and Food Products Technology (SA, SB, SC)	**Any One Major from:** Botany, Zoology, Environmental Science
3.	Paramedical Group	Child, Old Age and Health care services (QA, QB, QC)	**Any One Major from:** Botany, Zoology, Environmental Science
		Medical Laboratory Technician (OA, OB, OC)	**Any One Major from:** Physics, **Chemistry,** Zoology
		Ophthalmic Technician (RA, RB, RC)	**Major:** Physics
		Radiology Technician (PA, PB, PC)	
4.	Technology Group	Electronics Technology (EA, EB, EC)	**Major:** Physics
		Electrical Technology (FA, FB, FC)	

Total programme Fee: Approximately ₹ 28,724/- for all 06 Semesters and Total ₹ 52,292/- for all 08 Semesters, which is duly approved by the university authorities [*Will be updated as per University Policy decision*]

Curriculum Transaction:

- 01 SLM e-Book will be developed for each theory course
- Total 12/06 Face-To-Face counseling sessions, each of 60 Minutes duration, will be provided at respective learner support center, for each theory course.
- Total 12/18 Face-To-Face counseling sessions, each of 120 Minutes duration, will be provided at respective learner support center, for each practical/Field project/ OJT/ CC courses. In the laboratory, instruction would be given for the experiments followed by demonstration and finally the learners have to do the experiments individually.
- Curriculum updation will be after every 3 years

Activity planner: This University and School will follow the Programme Calendar declared by UGC/DEB, New Delhi time to time. Teaching-Learning of students shall start from 01-September/01-Feb every year. Online continuous assessment proposed for all offered programmes.

SN	Activity Description	Yearly Pattern/ Odd semesters like 01, 03, 05 and 07 From 01-Sep Till 31-Jan	Even semesters like 02, 04, 06 and 08 From 01-Feb Till 31-Jul
Online Admission: offered on Annual basis for 2 semesters in each academic year. Only for 'C149: Certificate progarmme in Beekeeping', Admissions shall be offered on Winter and Summer batch basis.			
01	Fresh and Further Yearly Admission	From 1st June 2025 Till Sept 2025 (For C149, Winter Batch: From Jul)	NA (For C149, Summer Batch: From Jan)
Teaching – Learning at the resp Learning Support Centers/ SCs for all Theory, Practical, Term-Work, Studio, Project, FP & OJT Courses			
02	Teaching – Learning (16 Weeks) & Backlog Clearing	**From 1st Sept 2025 Till 14th Dec 2025**	**From 18th Jan 2026 Till 19th April 2026**
Online End Exam (EE) Form Submission (Required only for Repeater Students)			
03	**Online** EE Form Submission by SCs/ students at University	On or Before 21-Oct	On or Before 23-Apr
Continuous Assessment (CA) Submission			
04	CA Availability	August 2025	March 2025
05	CA Submission by Students	Upto last week of Dec 2025	Upto first week of Apr 2026
End Examination (EE) (Required only for Non-Repeater Students)			
07	**Online** EE Form Submission by SCs/ students at University	Upto third week of Oct 2025	Upto first week of Apr 2026
07	**End Exam for Theory Courses**	**From first week of Jan 2026**	**From first week of May 2026**
08	EE for Activity Courses (Pr, TW, PW, STW, SV)	Immediately after/ before the schedule of the end exam for theory courses, but positively before **1st Dec 2025 to 31st Dec 2025**	Immediately after/ before the schedule of the end exam for theory courses, but positively before **10th Apr 2026 to 10th May 2026**

09	OJT/Field Project (Completion Report/Presentation/Viva)	After Winter exam - Within One Month	After Summer exam - Within One Month
10	End Exam Result Declaration	Within 45 days from the last day of End Exam	Within 45 days from the last day of End Exam
Semester End Vacation			
10	Semester End Vacation	Jan	July

Policy:
Refer Evaluation pattern given in Annexure III.

For exit option:

1. **Multiple Entry Multiple Exit Option**:
   Compliance with MS G.R. No. NEP-2022/CR No. 09/VISHI-3/शिकाना, dated 20April, 2023.

SN	Level of the Programme	Entry Option (with criteria)	Exit Option (with criteria)
1	Certificate Level	12th / (10+2)th / Level 4.0 examination conducted by Maharashtra State Board of Secondary and Higher Secondary Education/CBSE/ ISC/NIOS or equivalent examinations by any Other State or any other recognized Board with Science Subjects Pass, including English and Chemistry **OR** (10+3) years or (12+2) years Engineering Diploma Pass, from Maharashtra State Technical Board / a statutory or recognized board/ university in India **OR** Higher Secondary School Certificate (10+2) Examination with English and the following +2 Level	Award of UG Certificate in the Faculty of Science - Chemistry (Level 4.5) with 44 credits and an additional 4 credits core NSQF course/ Internship.

				HSC Vocational (MCVC) Group: Medical Laboratory Technician (OA, OB, OC) Pass	
		2	Diploma Level	UG Certificate in the Faculty of Science – Chemistry (Level 4.5) with 40-44 credits	Award of UG Diploma in the Faculty of Science – Chemistry (Level 5.0) with 88 credits and an additional 4 credits core NSQF course/ internship
		3	Degree Level	UG Diploma in the Faculty of Science – Chemistry (Level 5.0) with 88 credits	Award of UG Degree Chemistry with 132 credits
g	Requirement of the Laboratory Support and Library Resources: 1. Laboratory Support to the learners (*if any*): 2. Provision of Practical book for learners (*if any*): Provision of Virtual Reality Methods for Practical in case of Online learning (*if any*):	Laboratory requirement and Library Resources – Yes. Being mandatory requirement of the programme, Institutes/Colleges affiliated with conventional university offering B.Sc. (Chemistry) will be only recognized as a Learner support center of this university for this programme. So, requirement of laboratory support and library resources will be automatically ensured. Additionally, school provides practical workbook in the form SLM book and other learning resources to all enrolled learners. University has already initiated in-house Science Laboratory development task at HQ, these labs will be made available to the enrolled learners in future. **Recommended**: Recognized LSCs with • Computer infrastructure with Wi-Fi/broadband connection with Chemistry related software/tool and Library facilities			
h	Cost Estimate of the Program and the Provisions: Indicate the Budgetary Requirement for: 1. Programme	Budget provision for this development under A.27.P.38: Fees/Royalties/ Honorarium to Writer/Editors/Trans. SLM development cost: approximately ₹ 60,00,000/-			

	Development 2. Program Delivery Program Maintenance	
i	Quality Assurance Mechanism and expected Program Outcomes*: 1. Define the Review Mechanism of the Program for enhancing the standards of curriculum, instructional design relevant to professional requirements: 2. Define Program Benchmark Statements: 3. Mechanism for Monitoring the effectiveness of the program: ***(Minimum standards must adhere to "UGC Open and Distance Learning Programmes and Online Programmes Regulations, 2020" & directions of the Statutory Bodies of the University)**	B.Sc. (Honours) programme is designed to provide scientific as well as professional level competency to learners, and offers advanced theoretical as well as practical knowledge to learners. This programme enables the learner to develop interest in knowing more about the Chemistry and to develop research attitude. University has policy to review and revise every course at least once in five years of its launching. **Quality Assurance Mechanism**: The following key result areas will be closely monitored. • Well qualified and experienced experts nomination on Programme Advisory Committee(PAC) for design and development of relevant course content • Well qualified subject experts for SLM development and Evaluation task • Enrolment of student (Equated Access) • Equal weightage for each credit in learner evaluation • Demonstrate in-depth knowledge of Chemistry, both in theory and practical • Examination Results • Placements/satisfaction of passing out students • Administrative/stakeholder feedback • Centre for Internal Quality Assurance (CIQA) to ensure quality of offered science programmes **Expected Program Outcomes:** After successful completion of this programme, students will be able to • Access Science Education: Take advantage of science education opportunities through Open and Distance Learning (ODL), making learning accessible and cost effective. • Enhance Skills: Improve their skills to increase job opportunities or start their own businesses. • Understand Key Concepts: Show a good understanding of important areas in Chemistry, such as Basic Inorganic, Physical chemistry, Organic Chemistry, Basic Analytical Chemistry, Industrial Chemistry, Green Chemistry, Polymer Chemistry, Co-ordination Chemistry, Biochemistry and Forensic Chemistry. • Apply Ethical Standards: Understand and follow ethical guidelines in both personal and professional life. • Analyze Information: Read and critically analyze ideas in textbooks and science magazines aimed at undergraduate learners. • Prepare for Careers: Get ready for further study in Chemistry or for jobs in science-related fields in both the public and private sectors. Also engage in life-long learning and will have recognition

B. **Duration & Nomenclature**

Name of Programme:	4 Year Bachelor of Science (Honours) (Chemistry)
Medium	English
Year	2026-27
Level	UG Level 4.5
Academic Session	July Onwards
Entry Qualification (as per the Specification of Degrees, 2014)	12th / (10+2)th / Level 4.0 examination conducted by Maharashtra State Board of Secondary and Higher Secondary Education/CBSE/ ISC/NIOS or equivalent examinations by any Other State or any other recognized Board with Science Subjects Pass, including English and Chemistry **OR** (10+3) years or (12+2) years Engineering Diploma Pass, from Maharashtra State Technical Board / a statutory or recognized board/ university in India **OR** Higher Secondary School Certificate (10+2) Examination with English and the following +2 Level HSC Vocational (MCVC) Group: Medical Laboratory Technician (OA, OB, OC) Pass For details Refer **Appendix III**
Duration (as per the Specification of Degrees, 2014)	4 Year
Name of the Department	School of Sciences

C. **Mode of Evaluation**

Year	2026-27	
Whether Weightages to continuous assessment and end semester examinations or term end examinations as per clause mentioned in Regulations	Yes 1. 30% - 70% weightage Pattern for Theory 2. 50% - 50% Weightage pattern for Practical/OJT/ VSC/SEC* 3. 100% Weightage to Continuous Assessment for FP/CC/CEP 4. * Only one SEC course is Theory type	
Examination Scheme	Formative and Summative	
Percentage of Continuous Assessment (%)	Theory	30%
	Practical/OJT /VSC/SEC	50%
	FP/CC/ CEP	100%
	Passing	40%
Percentage of Term End Examination (%)	Theory	70%
	Practical/OJT/ VSC/SEC	50%
	Passing	40%

Pass or Fail Criteria	40% for Pass
Pass/Fail Criteria (% Pass Marks)	40% and above - Pass Below 40 % - Fail

D. Mode of Examination

Whether examination through Online(For ODL Programs)	No

E. SLM Development (Submit all SLM in pdf in pendrive and prepare the SLM availability sheet in the order as per sample in pdf for each program separately)

Particulars	% SLM in house developed	% SLM in collaboration with HEI (It should not be more than 40% of total SLM. If it is in collaboration then provide MOU in Soft & Hard copy
Printing Material	100%	–
Audio-Video Material	-	–
Online Material	Yes [pdf of SLMs]	–
Compute based Material	–	–

F. Program wise faculty details (Requirement of Minimum three faculty not below the rank of Assistant Professor to be furnished in the following format – to be taken from Establishment

Sr. No.	Emp. No	Name of the Faculty	Designation	Date of Joining	Qualification	Specialization	Teaching experience	Address	Phone no	Email	Appointment letter
1	Y1051	Dr. Dnyaneshwar I Bhusanur	Academic Coordinator	11/03/2024	M.Sc. Chemistry, NET(JRF), Ph. D.	Organic Chemistry	NA	YCMOU	8698052565	dnyaneshwarbhusanur@gmail.com	04/03/2024
2	Y1113	Ms. Harshada Godse	Academic Coordinator	05/05/2025	M.Sc. Chemistry, SET	Analytical Chemistry	NA	YCMOU	7448190361	Harshadagodse21@gmail.com	01/04/2025

G. List of Learner Support Centres Program wise and Region wise to be submitted as per following format. (We have intimated the same to Director SSD. **You are requested to give him the list of programs for which the LSCs data is required.**) – to be taken from SSD Director

Sr. No	Study centre code	Name & Address of LSC	Name of the HEI to which college/Institute is affiliated (where LSC is established)	Whether the College /Institute Private or Govt. (where LSC is established)	Name and Contact Details of Coordinator/ counsellor :	Qualification of Coordinator/ Counsellor :	No. of Counsellor :	Name of Proposed Programmes/ Course from July, 2023 onwards:	Approved	Not Approved with Reason

Annexure – I

Minor Courses offered from School of Sciences for other discipline of same faculty or different faculty other than Chemistry as a Major

LEVEL/ SEM	CR.	C. T	Physics	Mathematics	Botany	Zoology	Environmental Science
4.5/ II	**2**	**T**	**PHYM101:** Basics of Electricity & Magnetism	**MATM101:** Foundation of Mathematics	**BOTM101**: Plant Diversity	**ZOOM101:** Animal Diversity of Invertebrates	**EVSM101:** Fundamentals of Environment
5.0/ III & IV	**2**	**T**	**PHYM201:** Thermal Physics	**MATM201:** Fundamentals of Calculus	**BOTM201**: Morphology and Anatomy of Flowering Plants	**ZOOM201:** Principle of Ecology	**EVSM201:** Wildlife Biology
	2	**P**	**PHYM202:** Lab Activities on PHYM201	**MATM202:** Practical Based on MATM201	**BOTM202:** Lab Activities on BOTM201	**ZOOM202:** Lab Activities on ZOOM201	**EVSM202:** Lab Activities on EVSM201
	2	**T**	**PHYM203:** Oscillations & Optics	**MATM203:** Applied Linear Algebra	**BOTM203:** Plant Physiology	**ZOOM203:** Fundamentals of Cell Biology	**EVSM203:** Water & Noise Quality
	2	**P**	**PHYM204:** Lab Activities on PHYM203	**MATM204:** Practical Based on MATM203	**BOTM204**: Lab Activities on BOTM203	**ZOOM204:** Lab Activities on ZOOM203	**EVSM204:** Lab Activities on EVSM203
5.5/ V & VI	**2**	**T**	**PHYM301:** Computational Physics	**MATM301:** Introductory Differential Equations	**BOTM301:** Introduction to Cytology	**ZOOM301:** Introduction to Aquatic Biology	**EVSM301:** Air & Soil Quality
	2	**P**	**PHYM302:** Lab Activities on PHYM301	**MATM302:** Practical Based on MATM301	**BOTM302:** Lab Activities on BOTM301	**ZOOM302:** Lab Activities on ZOOM301	**EVSM302:** Lab Activities on EVSM 301
	2	**T**	**PHYM303:** Basics of Instrumentation	**MATM303:** Numerical Methods	**BOTM303:** Plant Genetics and Variation	**ZOOM303:** General Parasitology	**EVSM303:** Environmental Governance
	2	**P**	**PHYM304**: Lab Activities on PHYM303	**MATM304:** Practical Based on MATM303	**BOTM304:** Lab Activities on BOTM303	**ZOOM304:** Lab Activities on ZOOM303	**EVSM304:** Lab Activities on EVSM 303

Annexure – II

Programme Objectives, Scope of the Programme & Programme Outcomes (PO)

and

Course Outcomes (CO)

Programme Name: 4 Year Bachelor of Science (Honours) (Chemistry)		
1	**Programme Objectives**	This programme has the following broad objectives: • Interdisciplinary Competence: To provide students with a strong foundation in Chemistry, fostering interdisciplinary knowledge and skills. • Deep Understanding: To ensure that students gain a deep understanding of the fundamental principles and concepts in Chemistry. • Problem-Solving Abilities: To equip students with problem-solving skills, enabling them to apply scientific methodologies to address complex issues that require expertise in the Chemistry disciplines. • Laboratory Proficiency: To develop practical laboratory skills, enabling students to design experiments, collect data, and analyze results in Chemistry. • Research Aptitude: To nurture research aptitude by encouraging students to engage in interdisciplinary research projects at the undergraduate level. • Effective Communication: To enhance communication skills, allowing students to communicate scientific findings effectively, both in writing and orally. • Ethical Responsibility: To instill ethical values and academic integrity, promoting responsible conduct in scientific research and experimentation. • Flexibility and Adaptability: To prepare students for diverse career opportunities, including academia, research, industry, and entrepreneurship, by offering a versatile skill set. • Leadership and Collaboration: To develop leadership qualities and the ability to work collaboratively in multidisciplinary teams to address complex challenges. • Awareness of Contemporary Issues: To create awareness of contemporary scientific issues, including environmental sustainability, emerging technologies, and societal relevance

<table>
<tr><td>2</td><td>Scope of the Programme</td><td>After successful completion of this programme, learners may get opportunities in various fields/sectors to work as
Flexible Career Paths: Graduates of this program are well-prepared for diverse career opportunities, including academia, research, industry, and entrepreneurship. They can pursue careers in areas such as Organic Synthesis, Analytical techniques, Industrial technology & Skills, nanotechnology, materials science, renewable energy, and more.
Career opportunities in both private and government sector/ in India and abroad: Chemists, Researcher, R & D Scientist, Subject Matter Expert, Technician, Radiologist and Content Developer.</td></tr>
<tr><td>3</td><td>Programme Outcome</td><td>After successful completion of this programme, learners will be able to
Access Science Education: Take advantage of science education opportunities through Open and Distance Learning (ODL), making learning accessible and cost effective.
Enhance Skills: Improve their skills to increase job opportunities or start their own businesses.
Understand Key Concepts: Show a good understanding of important areas in Chemistry, such as Organic chemistry, Inorganic chemistry, Physical Chemistry, Analytical Chemistry, Industrial Chemistry.
Use Laboratory Equipment: Skill fully use laboratory tools, materials, and computer software.
Apply Ethical Standards: Understand and follow ethical guidelines in both personal and professional life.
Analyze Information: Read and critically analyze ideas in textbooks and science magazines aimed at undergraduate learners.
Prepare for Careers: Get ready for further study in Chemistry or for jobs in science-related fields in both the public and private sectors. Also engage in life-long learning and will have recognition</td></tr>
<tr><td>4</td><td>Course Outcomes</td><td>
<table>
<tr><th>SN</th><th>Course Code & Name</th><th>Course Outcomes
(After successful completion of the course, student should be able to-)</th></tr>
<tr><td colspan="3">Semester I</td></tr>
<tr><td>1</td><td>CHEC101: Basic Inorganic & Organic Chemistry</td><td>• Basic inorganic and organic chemistry.
• Describe the key postulates of Bohr's model of the atom.
• Explain the concept of wave-particle duality for both matter and radiation.
• Understand the basics of quantum mechanics and hydrogenic wave functions.
• Understand the general characteristics of ionic bonding.
• Analyze the strength of organic acids and bases and understand aromaticity.</td></tr>
</table>
</td></tr>
</table>

					• Understand structural effects on organic molecules and cleavage of bonds.
		2	**CHEC102:** Lab Activities on CHEC101		• Calibration and use of apparatus. • Understand the principles of the titration reaction. • Implement best practices in chromatography. • Understand the basics of organic qualitative analysis. • Identify functional groups and elements. • Understand the principles of purification techniques.
		3	**CHEE101:** Chemistry in Everyday Life (Offer For other faculty)		• Identify key components of food chemistry and their roles in determining food quality. • Classify fats based on their saturation levels and structural characteristics. • Identify common detergent chemicals including additives, colors, Flavors, Enzymes and explain the purpose and function of each component in detergent formulations. • Apply knowledge of cosmetic chemistry to analyze the formulation of different shampoos, identifying the role of each constituent.
		4	**CHEE102:** Industrial Safety Management (Offer For other faculty)		• Analyze the effect of release of toxic substances • Understand the industrial laws, Regulations and Source models. • Apply the methods of prevention of fire and explosions. • Understand the relief and its sizing methods. • Understand the methods of hazard identification and preventive measures
		5	**CHEV101:** Food Chemistry		• Identify key components of food chemistry and their roles in determining food quality. • Classify fats based on their saturation levels and structural characteristics. • Identify common detergent chemicals including additives, colors, flavors, and enzymes and explain the purpose and function of each component in detergent formulations.
		6	**SECS101:** Basic Instrumentation Skill		• Demonstrate competence in using various instruments and equipment. • Safely conduct experiments and collect reliable data.

					• Analyze and interpret experimental results effectively. • Apply instrumentation skills in their respective fields of study and research. • Foster a culture of safety, ethics, and environmental responsibility in scientific work. • Identify, describe, and explain the function of various scientific instruments used in their respective field. • Demonstrate correct operation, calibration, and maintenance procedures for laboratory instruments, ensuring accuracy and reliability in their measurements. • Adhere to laboratory safety guidelines, use personal protective equipment (PPE) appropriately, and follow best practices to minimize risks and ensure a safe working environment.
			7	**AECL101:** Listening and Speaking Skills in English	• Students will be able to identify, comprehend, and interpret main ideas and supporting details in spoken English across different contexts using active and critical listening strategies. • Students will demonstrate correct pronunciation, stress, and intonation in spoken English, showing increased fluency and confidence in both academic and social interactions. • Students will be able to initiate and sustain basic conversations using polite expressions, greetings, and small talk appropriate to different situations. • Students will engage effectively in extended conversations in formal and informal contexts, using cohesive devices and demonstrating good interactional competence and turn-taking skills. • Students will participate constructively in group discussions, express opinions logically and respectfully, and respond persuasively to others' viewpoints. • Students will perform effectively in interviews, applying suitable verbal and non-verbal communication techniques with confidence and professional self-presentation. • Students will communicate accurately and courteously over the telephone, demonstrating clarity, appropriate etiquette, and the ability to handle both formal and informal telephonic

					interaction.
		8	**VECD101:** Introduction to the Constitution of India	• Understand the philosophy, structure, and values of the Constitution of India. • Gain awareness about Fundamental Rights, Fundamental Duties, and Directive Principles of State Policy. • Understand the role and functioning of constitutional institutions such as Parliament, Executive, and the Judiciary. • Understand Citizenship, Democracy, and the Rule of Law. • Develop the capacity to critically analyze constitutional provisions and contemporary political issues.
		9	**IKSK101:** भारतीय ज्ञान परंपरा – कला आणि प्राचीन भारतीय भाषा	• To be Updated
			IKSK102: भारतीय ज्ञान परंपरा – सामाजिक शास्त्रे	• To be Updated
			IKSK103: भारतीय ज्ञान परंपरा – आरोग्य शास्त्र	• To be Updated
			IKSK104: भारतीय ज्ञान परंपरा – विज्ञान आणि तंत्रज्ञान	• To be Updated
			IKSK105: Indian Knowledge System – Generic	• To be Updated
		10	**CCRX101:** Health and Wellness-I	• To be Updated
			CCRX102: Yoga Education-I	• To be Updated
			CCRX103: Sports and Fitness-I	• To be Updated
			CCRX104: Cultural Activities-I	• To be Updated
			CCRX105: NSS-I	• To be Updated
			CCRX106: Fine/Applied/Visual/Performing Arts-I	• To be Updated
			Semester II		
		1	**CHEC103:** Physical & Organic Chemistry	• Understand the principles and definitions of thermochemistry. • Apply Kirchhoff's equation. • Analyze ionization of weak acids and bases.

					• Understand electrophilic substitution reactions. • Reactivity of C-Halogen bonds. • Apply knowledge to reaction mechanisms.
			2	**CHEC104:** Lab Activities on CHEC103	• Use appropriate techniques and equipment to accurately measure temperature changes and concentrations. • Explain the concept of enthalpy of ionization and its significance in chemical reactions. • Measure the pH of prepared buffer solutions using appropriate pH meters or indicators. • Calculate the dissociation constant (Ka) of a weak acid using experimental data from pH metric titrations. • Explain the principles and purposes of recrystallization, Distillation and sublimation as methods of purification. • Accurately measure and determine physical constants of various organic liquids.
			3	**CHEM101**: Basic of Physical Chemistry (For other Discipline)	• Understand the principles and definitions of thermochemistry. • Analyze ionization of weak acids and bases. • Understand and Use Thermodynamic Concepts • Analyze Real-World Applications of Chemical Equilibrium • Apply Theories of Acids and Bases
			4	**CHEE103:** Pesticides Chemistry (Offer For other faculty)	• Students will be able to learn about the basic role of pesticide in everyday life, various ingredients and their role in controlling the pest. • Students can also educate the farmers/gardeners to choose the appropriate pesticides for their crop production • Teach about the pesticides and their toxicity with respect to structure and category • Explain the preparation and property of pesticides • investigate the pesticide residues, Prevention and care
			5	**CHEE104:** Food Safety Adulteration & Detection	• Recognize the key practices involved in food hygiene and their role in preventing foodborne illnesses.

				(Offer For other faculty)	• Identify different types of food contamination and spoilage and understand how they affect food quality and safety. • Learn preventive measures and food safety regulations to ensure the protection of public health. • Understand the concept and significance of food adulteration and its impact on health. • Develop skills to promote consumer awareness and implement food safety practices in daily life.
			6	**CHEV102:** Chemistry of Biomolecules	• Students will understand the concept of reducing sugars and their role in carbohydrate chemistry • Improve technical skills in preparing reagents, calibrating instruments, and conducting precise measurements in a laboratory setting. • Understand the specific chemical reactions involved in these tests (oxidation-reduction, complex formation). • Understand the biological significance of carbohydrates.
			7	**SECS102:** MS–Excel with AI	• Effectively use basic Excel functions and features to perform data analysis and manipulation tasks. • Create various types of charts and visualizations in Excel and interpret them to extract meaningful insights • Use Excel's statistical tools to perform and interpret basic statistical analyses. • Leverage AI-powered features in Excel to gain insights and enhance their data analysis capabilities. • Use Power Query to import, clean, and transform data from various sources efficiently. • Create and use macros to automate repetitive tasks, improving efficiency in Excel.
			8	**AECL102:** Reading and Writing Skills in English	• Demonstrate an expanded vocabulary and apply appropriate word choices in reading and writing contexts, and comprehend, interpret, and analyse different types of texts with accuracy and critical understanding.

					• Employ suitable reading strategies to achieve specific objectives such as skimming, scanning, and intensive reading, and read efficiently with improved speed and retention, adjusting pace according to text difficulty, and interpret data and information effectively from tables, charts, diagrams, and graphs. • Construct grammatically correct and meaningful sentences using appropriate structures and transformations, and write coherent and well-organized paragraphs and essays with logical development of ideas. • Compose formal and informal letters using appropriate tone, format, and style, and prepare structured and concise reports for academic and professional purposes, and write effective and context-appropriate emails and social media messages using clarity and digital etiquette. Integrate reading and writing skills to express ideas logically, persuasively, and accurately across contexts.
			9	**VECD102:** Environmental Education	• Analyze historical, cultural, and industrial impacts on the environment, and explain the evolution of sustainability. • Distinguish between environmental issues at different spatial and temporal scales and evaluate pollution types and impacts. • Interpret pollution data and health standards, and assess pollution-related health risks. • Apply principles of environmental management and sustainability tools in real-world situations for decision-making and policy assessment.
			10	**CCRX107** Health and Wellness-II	• To be Updated
				CCRX108 Yoga Education-II	• To be Updated
				CCRX109 Sports and Fitness-II	• To be Updated
				CCRX110	• To be Updated

				Cultural Activities-II	
				CCRX111 NSS-II	• To be Updated
				CCRX112 Fine/Applied/ Visual/Performing Arts-II	• To be Updated
				Semester III	
			1	**CHEC201:** Advanced Physical & Organic Chemistry	• Understand how impurities affect the partial miscibility of liquids and the principle of steam distillation. • Understand the concept of ionic mobility and its relationship to conductivity and transference number. • Apply the Reformatsky reaction, Including its mechanism and typical applications. • Describe the zwitter ionic form of amino acids and its implications for their chemical behavior.
			2	**CHEC202:** Ancient Indian Chemistry	• Demonstrate a comprehensive understanding of ancient Indian Chemistry, its historical context, and its significance. • Analyse and interpret key concepts and principles in classical mechanics, astronomy, optics, acoustics, thermodynamics, electricity, magnetism, and cosmology as they existed in ancient India. • Apply knowledge gained from ancient Indian Chemistry to critically evaluate its impact on contemporary science and philosophy. • Understand the principles behind the production and processing of ceramics, stones, and glass • Appreciate the broader cultural and historical context in which scientific ideas in ancient India developed and evolved.
			3	**CHEC203:** Lab Activities on CHEC201	• Understand the relationship between equilibrium constants, Gibbs free energy, enthalpy and Entropy. • Use spectrophotometry and other analytical techniques to measure concentrations of reactants and products. • Explain the significance of the cell constant in conductivity measurements. • Use chemical tests to distinguish between different functional groups, Such as

					carboxylic acids, Phenols, Amines and hydrocarbons.
		4	**CHEM201:** Introduction to Organic Chemistry (For other Discipline)	• Analyze the strength of organic acids and bases and understand aromaticity. • Understand structural effects on organic molecules and cleavage of bonds. • Analyze the stability of reactive intermediates (carbocations, carbanions, and free radicals) • Assess the stability and reactivity of aromatic, non-aromatic, and antiaromatic compounds in chemical reactions • Understand the mechanisms behind free radical substitution, halogenation, and addition reactions (Markownikoff's and anti-Markownikoff's rules)
		5	**CHEM202:** Lab Activities on CHEM201 (For other Discipline)	• Learn how to accurately determine the melting points of various solids and the boiling points of liquids using standard laboratory techniques. • Understanding purity and its impact on physical properties. • Identify the steps involved in the preparation of organic compounds such as p-nitroacetanilide, benzoic acid, and p-bromoacetanilide from their precursors. • Understand the principles of solubility and recrystallization, including the selection of appropriate solvents, cooling rates, and crystallization techniques to purify compounds. • Perform the laboratory synthesis of p-nitroacetanilide, benzoic acid, and p- • Bromoacetanilide, following appropriate safety and procedural guidelines.
		6	**CHEE201:** Fuel Chemistry (Offer For other faculty)	• Explain the historical importance and technological advancements in the development and use of solid, Liquid and gaseous fuels. • Understand the factors influencing the ignition temperature and flame temperature of different fuels. • Examine the environmental and economic trade-offs of using biofuels, synthetic fuels, and solar fuels. • Understand the principles of coal combustion, coke-making, coal tar distillation, and petroleum processing methods like cracking and reforming. • Apply knowledge of coal and petroleum

					processing to evaluate their effectiveness in industrial applications.
		7	**CHEV201:** Introduction to Medicinal Chemistry	• Explain the concept of partition coefficient and its importance in understanding the distribution of a solute between two immiscible solvents (e.g., water and benzene). • Explain the basic principles of paper chromatography, including the roles of the stationary phase (paper) and the mobile phase (solvent). • Understand the importance of choosing appropriate solvents for determining the partition coefficient of organic compounds. • Analyze the titration curve or data obtained from the back titration of ibuprofen to ensure accuracy and precision. • Gain knowledge of the chemical reactions involved in the synthesis.
		8	**AECL201:** श्रवण आणि संभाषण कौशल्ये	• To be Updated	
		9	**CHEF204:** Field Project	• Students will demonstrate the ability to apply theoretical knowledge and concepts to real-world situations, effectively bridging the gap between academia and practical applications. • Students will develop advanced research and investigative skills, including the ability to design and execute research projects, collect and analyze data, and draw well-founded conclusions. • Students will conduct independent research, demonstrating the ability to formulate research questions, design appropriate methodologies, and independently execute fieldwork or data collection. • Students will exhibit effective collaboration and communication skills, demonstrating the ability to work collaboratively with others, engage in professional dialogue, and effectively communicate their research findings to diverse audiences. • Students will showcase advanced problem-solving and critical thinking abilities, demonstrating the capacity to identify and address challenges	

					encountered during fieldwork, analyze complex data, and propose innovative solutions. • Students will demonstrate a thorough understanding of ethical considerations, field safety protocols, and best practices in their chosen field of study.
		10	**CCRX201:** Health and Wellness-III	• To be Updated	
			CCRX202: Yoga Education-III	• To be Updated	
			CCRX203: Sports and Fitness-III	• To be Updated	
			CCRX204: Cultural Activities-III	• To be Updated	
			CCRX205: NSS-III	• To be Updated	
			CCRX206: Fine/Applied/Visual/Performing Arts-III	• To be Updated	
		Semester IV			
		1	**CHEC205:** Basic Analytical Chemistry	• Acquire knowledge of different spectroscopic techniques such as IR, NMR, ESR and AAS Spectroscopy. • Explain quality assurance practices associated with the use of reference materials (RMs) in analytical chemistry. • Understand the importance of representative sampling and proper sample preparation techniques to ensure accurate and reliable analytical measurements. • Familiarize to various types of PES techniques. • Apply the nuclear and atomic reactions in various fields of energy production and medicines.	
		2	**CHEC206:** Molecular Modeling Chemistry	• Apply basic principles of quantum mechanics to molecular modeling, Including understanding the Schrödinger equation. • Identify the temperature limits for hydrogen bonding in water. • Understand classical methods of computer simulations, including molecular dynamics and Monte Carlo simulations.	

					• Explain how hydrogen bonding influences the physical and chemical properties of water.
			3	**CHEC207:** Lab Activities on CHEC205 & CHEC206	• Explain the role of carbonates in soil chemistry and their effect on soil pH and fertility. • Use appropriate indicators and titrant to accurately measure pH changes during titration. • Develop proficiency in handling laboratory equipment, including pH meters and burettes. • Identify and minimize potential sources of error in pH titration experiments. • Perform iodometric titration to determine the percentage purity of a given alcohol sample.
			4	**CHEM203:** Introduction to Inorganic Chemistry (For other Discipline)	• Describe the key postulates of Bohr's model of the atom. • Explain the concept of wave-particle duality for both matter and radiation. • Understand the general characteristics of ionic bonding. • Understanding of Valence Bond (VB) Theory. • Understanding the Role of Lone Pairs in Molecular Shape.
			5	**CHEM204:** Lab Activities on CHEM203 (For other Discipline)	• Understand and apply concentration concepts. • Prepare solutions of specific molarity and normality. • Apply qualitative analysis techniques. • Understand the basic principles of paper chromatography and its application in the separation and identification of metal cations. • Apply the paper chromatographic technique to separate and identify cations from a mixture.
			6	**CHEE202:** Chemistry of Cosmetics (Offer For other faculty)	• Understanding the cosmetics for the skin care products. • Analyze the challenges in formulating herbal cosmetics and differentiate between synthetic and herbal formulations. • Understand the role of herbal ingredients in cosmetic formulations for hair, skin, and oral care, and the guidelines for their safe use. • Apply knowledge of cosmetic chemistry to formulate hair care and herbal cosmetic

				products that comply with regulatory standards and address specific cosmetic issues.
		7	**SECS201:** Intellectual Property Rights (IPR)	• Understand the Concept of IPR and different Kinds of IPR. • Know the procedure for application of various IPs. • Understand infringement and remedies available. • Know various issues relating to protection of IPR in Digital Age.
		8	**AECL202:** वाचन आणि लेखन कौशल्ये	• To be Updated
		9	**CHEG208:** Awareness of Sustainable Development Goals-I	• To be Updated
		10	**CCRX207:** Health and Wellness-IV	• To be Updated
			CCRX208: Yoga Education-IV	• To be Updated
			CCRX209: Sports and Fitness-IV	• To be Updated
			CCRX210: Cultural Activities-IV	• To be Updated
			CCRX211: NSS-IV	• To be Updated
			CCRX212: Fine/Applied/Visual/Performing Arts-IV	• To be Updated
				Semester V
		1	**CHEC301:** Physical & Inorganic Chemistry	• Identify and explain the factors that cause real gases to deviate from ideal gas behaviour. • Apply the concepts of kinetic theory to solve practical problems involving real gases. • Use the Arrhenius equation to calculate activation energy from experimental data. • Apply knowledge of d-block chemistry to solve problems related to trends, properties, and reactivity. • Analyse and explain the inner and outer orbital complexes of specific d-block elements. • Apply crystal field theory to solve problems related to the electronic

					structure, Stability and Properties of transition metal complexes.
		2	**CHEC302:** Industrial Chemistry-I		• Identify and describe the types of addition polymers, including those formed by free radical, Ionic or Coordination mechanisms. • Describe the different types of crystalline structures in polymers, Including crystalline, amorphous regions and how these structures influence polymer behaviour. • Discuss factors that influence the chemical resistance of polymers, such as polymer structure and chemical environment. • Understand the different processing techniques used to transform raw latex into rubber products.
		3	**CHEC303:** Lab Activities on CHEC301 & CHEC302		• Study and analyse how the surface tension of a detergent solution changes with varying concentration. • Use an Ostwald's viscometer to determine the relative and absolute viscosity of a liquid or dilute solution. • Apply the Arrhenius equation to calculate the activation energy from experimental data. • Investigate the color of the sodium Cobaltinitrite complex and understand the reasons behind it, such as the coordination environment and electronic transitions.
		4	**CHEC304:** Chemistry in Everyday life		• Identify key components of food chemistry and their roles in determining food quality. • Classify fats based on their saturation levels and structural characteristics. • Identify common detergent chemicals including additives, colors, flavors, and enzymes and explain the purpose and function of each component in detergent formulations. • Identify potential environmental impacts of detergent chemicals, such as water pollution and toxicity. • Assess the potential health hazards and environmental impacts associated with synthetic dyes, including toxicity and pollution.

		5	**CHEC305:** Biochemistry	• Classify lipids into simple, compound and derived categories, providing examples such as triglycerides, Phospholipids, Steroids and prostaglandins. • Apply understanding of amino acid chemistry to biochemical processes such as protein synthesis and amino acid metabolism. • Define holoenzymes, Apo enzymes, Prosthetic groups, Cofactors and Coenzymes and recognize their roles in enzyme structure and function. • Identify the structural components of DNA and RNA, Including phosphoric acid, pentose sugar (Deoxyribose in DNA, Ribose in RNA) and nitrogenous bases.
		6	**CHEC306:** Co-ordination Chemistry	• Define essential terminology including ligands, Types of ligands based on donor atoms and coordination modes, Chelate ligands, Central metal ion and charge on complex ions. • Understand the fundamental assumptions of Werner's coordination theory regarding the formation of coordination compounds. • Discuss limitations and extensions of VBT, including its compatibility with other theories such as molecular orbital theory (MOT). • Apply MOT principles to predict the electronic structure and properties of coordination complexes in various contexts. • Differentiate between paramagnetism, Diamagnetism and antiferromagnetism.
		7	**CHEM301:** Advanced Physical Chemistry (For other Discipline)	• Apply the concepts of kinetic theory to solve practical problems involving real gases. • Apply general methods for determining the order of a reaction. • Use the Arrhenius equation to calculate activation energy from experimental data. • Analyze the variation of conductivity and molar conductivity with dilution for weak and strong electrolytes. • Understand the concept of decay chains and how radioactive isotopes transform into stable or other radioactive isotopes over time.

		8	**CHEM302:** Lab Activities on CHEM301 (For other Discipline)	• Study and analyse how the surface tension of a detergent solution changes with varying concentration. • Use an Ostwald's viscometer to determine the relative and absolute viscosity of a liquid or dilute solution. • Apply the Arrhenius equation to calculate the activation energy from experimental data. • Interpret experimental data to identify the order of a reaction and its rate constant.
		9	**CHEV301:** Chemistry of Soils and Agrochemicals	• Students will able to understand about the different types of soils and fertilizers. • They can also learn about the soil composition and its other important physical properties. • They may be able to guide farmers/ society fertilizer they can add for nourishment of their soils for better crop productivity. • Students will acquire theoretical and practical knowledge on various aspects of soil chemistry or different soil chemical properties.
		10	**CHEF307:** Field Project	• Students will demonstrate the ability to apply theoretical knowledge and concepts to real-world situations, effectively bridging the gap between academia and practical applications. • Students will develop advanced research and investigative skills, including the ability to design and execute research projects, collect and analyze data, and draw well-founded conclusions. • Students will conduct independent research, demonstrating the ability to formulate research questions, design appropriate methodologies, and independently execute fieldwork or data collection. • Students will exhibit effective collaboration and communication skills, demonstrating the ability to work collaboratively with others, engage in professional dialogue, and effectively communicate their research findings to diverse audiences. • Students will showcase advanced problem-solving and critical thinking

					abilities, demonstrating the capacity to identify and address challenges encountered during fieldwork, analyze complex data, and propose innovative solutions. • Students will demonstrate a thorough understanding of ethical considerations, field safety protocols, and best practices in their chosen field of study.
			11	**CHEG308:** Awareness of Sustainable Development Goals-II	• To be updated
				Semester VI	
			1	**CHEC309:** Green Chemistry	• Apply knowledge of renewable resources and feed stocks in chemical processes. • Choose and use green solvents effectively to reduce the environmental impact of chemical processes. • Perform life cycle assessments (LCAs) to evaluate the environmental impact of chemical products and processes. • Apply critical thinking to evaluate chemical processes and propose green alternatives.
			2	**CHEC310:** Industrial Chemistry-II	• After successful completion of this course, student should be able to • Differentiate between dry and wet corrosion mechanisms and their respective factors such as temperature, humidity, and chemical composition. • Understand the mechanisms and factors influencing corrosion processes in various environments. • Define essential properties desired in paints for different applications, such as adhesion, durability, flexibility, gloss, opacity, and resistance to weathering and chemicals • Explain the fundamental properties of semiconductors, including conductivity, band structure, and doping.
			3	**CHEC311:** Lab Activities on CHEC309 & CHEC310	• Apply the knowledge of atom economy and green chemistry principles to design more sustainable chemical processes. • Investigate how reactants are converted into products and identify any by-products or waste generated during the reactions.

					• Explore how thiamine hydrochloride can be used as a green alternative to cyanide in the Benzoin condensation reaction. • Understand the reaction conditions, including the use of a base catalyst and the choice of reactants.
			4	**CHEC312:** Advanced Agrochemicals, Bio- pesticides & Fertilizers	• Define agrochemicals and recognize their importance in agriculture for enhancing crop productivity, protecting crops from pests and diseases and ensuring food security. • Differentiate between conventional and advanced pesticide formulations. • Evaluate the bio efficacy of various neem-based preparations in pest management across different crops and pests. • Study attractants and repellents used in pest management and public health, including their chemical properties and modes of action. • Understand how these properties influence nutrient availability, soil interactions, and crop response.
			5	**CHEC313:** Forensic Chemistry	• Identify significant milestones and key figures in the development of forensic science in the country. • Explore the integration of forensic science with other scientific disciplines and its broad applications. • Identify and describe the various branches of forensic science, such as forensic pathology, toxicology, anthropology, deontology, entomology, and digital forensics. • Explain the specific roles and applications of each branch in criminal investigations and legal proceedings. • Integrate chromatographic techniques into forensic investigations by analyzing real-world case studies.
			6	**CHEC314:** Application of computer in Chemistry	• Identify the impact of computational chemistry in various chemical disciplines. • Explain the principles and concepts of molecular modeling and its applications in various scientific domains. • Apply molecular mechanics techniques to predict molecular structures, energetic, and properties accurately. • Understand the mechanisms and kinetics of redox processes at the molecular level

					through computational approaches. • Apply computational techniques to analyze biological data and solve biochemical problems.
		7	**CHEM303:** Introduction to Organic and Inorganic Chemistry (For other Discipline)		• Understand and apply the Reformatsky reaction, Including its mechanism and typical applications. • Describe the zwitterionic form of amino acids and its implications for their chemical behavior. • Apply knowledge of d-block chemistry to solve problems related to trends, properties, and reactivity. • Analyze and explain the inner and outer orbital complexes of specific d-block elements, including Cr, Fe, Co, Ni, and Cu. • Apply crystal field theory to solve problems related to the electronic structure, Stability and Properties of transition metal complexes.
		8	**CHEM304:** Lab Activities on CHEM303 (For other Discipline)		• Explain the importance of systematic separation in analyzing ionic mixtures with multiple species. • Understand the principles of elemental analysis (for C, H, N, S, halogens) in organic compounds. • Analyze any discrepancies in the results obtained from spot tests and other qualitative detection methods. • Understand the role of redox reactions in qualitative analysis. • Understand the chemical principles behind complex formation.
		9	**CHEO315:** On Job Training		• Demonstrate proficiency in applying theoretical knowledge and academic concepts to real-world professional situations. • Possess job-specific skills that are relevant to their chosen field of study, enabling them to perform tasks and responsibilities effectively and efficiently. • Acquire a comprehensive understanding of industry practices, trends, and challenges, contributing to their overall knowledge and expertise in the field. • Establish professional networks and relationships, expanding their professional connections and opportunities for future collaborations

					and career advancement. • Develop problem-solving and critical thinking abilities, demonstrating the ability to analyze complex situations, make informed decisions, and propose effective solutions. • Demonstrate professionalism, adaptability, and effective communication skills in a professional work environment.
				Semester VII	
			1	**CHEC401:** Inorganic Chemistry-I	• Explain the nuclear structure, stable and unstable atomic nuclei, and nuclear reactions. • Analyse selected crystal structures explain what kind of parameters that affect the crystal structure of a compound and perform calculations of the lattice enthalpy of ionic compounds. • Analyse the various defects and its application on inorganic crystals. Explain the fundamentals of metallic clusters. • Understand the periodic properties of the different groups of compounds focusing on production methods and application of selected elements and compounds. • Evaluate the structure and bonding in molecules and predict the structure of molecules.
			2	**CHEC402:** Physical Chemistry-I	• Solve the problems related to 1D box. • Explore the role of operators in quantum. • Understand the solve questions basis on rates of different reactions. • Evaluate the concept of group theory to predict the spectroscopic properties of molecules • Use to differentiate between different theories of kinetics.
			3	**CHEC403:** Organic Chemistry-I	• Recognize either molecule is aromatic, non-aromatic or antiaromatic. • Describe mechanism of different aliphatic nucleophillic substitution reactions. • Undrstand the potential energy diagrams. • Apply a versatile knowledge of different name reactions and their application in synthesis. • Explore the different organic reaction mechanisms
			4	**CHEC404:** Lab Activities on	• Build technical skill. • Generalize the qualitative analysis by

			CHEC401, CHEC402 & CHEC403	semi micro-qualitative analysis method. Understand the basic concept and advantages of semi- micro qualitative analysis. • Apply the techniques to prepare of inorganic complexes. • Analyze the systematic separations of d-block elements. Evaluate the d-block elements with their special tests. • Apply the step wise procedure to predict the anions along with metals.
		5	**RESR405:** Research Methodology	• Select and apply appropriate research designs based on the research question or problem. • Formulate clear and relevant research questions or hypotheses. • Analyze and interpret data using appropriate statistical techniques. • Identify and address ethical considerations in research, ensuring the protection of participants and data integrity. • Develop critical thinking skills in evaluating research studies, identifying strengths and weaknesses, and proposing improvements.
		6	**CHEC406:** Physical Methods in Chemistry	• Understand about electron spectroscopy and thermal analysis. • Analyze Circular Dichroism and Optical Rotatory Dispersion. • Explore the Electron Spin Resonance spectroscopy • Analyze about flame emission spectroscopy. • Apply the spectroscopic concepts for separation and identification of mixture compounds/ complex/ metals
		7	**CHEC407:** Polymer Chemistry	• Explaining the basic concepts of polymer. Techniques & Kinetics of polymer. • Explore the Study of crystalline nature & degree of crystallinity. • Understand polymer degradation & polymer reactions. • Analyze stereochemistry of polymers & determination of molecular weight.
		Semester VIII		
		1	**CHEC409:** Inorganic Chemistry-II	• Explain the theories of bonding in coordination compounds. • Comprehend the kinetics and mechanisms of reactions of complex

					compounds. • Explore the magnetic properties of coordination compounds. • Analyze the types of coordination compounds like metal carbonyls, carbocyclic picomplex in coordination compounds • Evaluate the geometries of simple molecules.
			2	**CHEC410:** Physical Chemistry-II	• Explain the thermodynamics and Non-ideal systems • Describe about the third law of thermodynamics • Understand the classical Maxwell-Boltzman and quantum statistics • Know about partition functions and determining thermodynamic properties • Understand heat capacity of solids. • Use the thermodynamic factors in various organic synthesis processes (how the reaction condition and reaction rate various depend on the thermodynamic factors).
			3	**CHEC411:** Organic Chemistry-II	• Recognize either molecule is aromatic, non-aromatic or antiaromatic. • Describe mechanism of different aliphatic nucleophillic substitution reactions. • Undrstand the potential energy diagrams. • Apply a versatile knowledge of different name reactions and their application in synthesis. • Explore the different organic reaction mechanisms
			4	**CHEC412:** Lab Activities onCHE409, CHE410 & CHE411	• Get knowledge about the heat of solution, determination of molecular weight and • Distribution coefficient. • Apply the basic concepts of conductometric titrations to determine the ionic strength. • Explain the various laws in electrochemistry. • Apply the conductometric method for the solutions and measure its conductivity. Give practice to handle the conductivity meter, spectrophotometer. • Evaluate distribution co-efficient influence the solubility of various systems.
			5	**CHEO413:** On Job Training	• Students will demonstrate proficiency in applying theoretical knowledge and

					academic concepts to real-world professional situations. • Students will possess job-specific skills that are relevant to their chosen field of study, enabling them to perform tasks and responsibilities effectively and efficiently. • Students will acquire a comprehensive understanding of industry practices, trends, and challenges, contributing to their overall knowledge and expertise in the field. • Students will establish professional networks and relationships, expanding their professional connections and opportunities for future collaborations and career advancement. • Students will develop problem-solving and critical thinking abilities, demonstrating the ability to analyze complex situations, make informed decisions, and propose effective solutions. • Students will demonstrate professionalism, adaptability, and effective communication skills in a professional work environment.
			6	**CHEC415:** Analytical Chemistry	• Impart knowledge on the instrumentation of UV-Visible spectrometry and FT-IR • Comprehend the basic principles of Thermal methods, Polarography, powder and single crystal XRD techniques. • Understand the applications of these instrumental techniques in studying various physical and chemical phenomena.
			7	**CHEC416:** Chemical Mathematics & Biostatistics	• Understand the functions, differential & integral. • Explore the partial differentiation • Explain the Vectors, Matrices & Determinants • Analyze the statistics, probability & sampling. • Use the knowledge of basic statistical methods to solve problems. Students are taught to operate. Use the statistical techniques in pharmaceuticals.

Appendix III

Evaluation Pattern

[CA and EE Evaluation Pattern as per the Minutes of the Meeting of the NEP Cell Dated 21.11.2023]

SN	Type of Course	Continuous Assessment (CA)	End Examination (EE)
1.	Theory (T) **4 Credit** 100 Marks CA: 30% EE: 70%	Each student is required to attempt total 02 (Two) "Continuous Assessments (CAs)" for each course of each Semester, as per the following details: 1. CA01: 'Continuous Assessment 01 (CA01)' on Credit 01 to Credit 04 of each course, consists of • 2 (Two) 'Short Answer Questions (SAQs)', each carrying 05 Marks, on Credit 01 and Credit 02 **and** • 1 (One) 'Long Answer Question (LAQ)' of 10 Marks, on Credit 03 and Credit 04. LAQ may consist of sub-questions. **CA01**: On Credit 01 to Credit 04, of Marks = (5x2 + 10) = **20 Marks** 2. CA02: 'Continuous Assessment 02 (CA02)' on Credit 01 to Credit 04 of each course, consists of • A test containing total **10** (Ten) 'Objective Type Questions, ' 05 (Five) on Credit 01 and Credit 02, and 05 (Five) on Credit 03 and Credit 04. Each 'Objective Type Question' of 1 Mark. **CA02**: On Credit 01 to Credit 04, of Marks = **10 Marks** 3. Maximum number of attempts for **CA**, during each semester: Single attempt only 4. **Total Marks**: **30** Marks	1. Student is required to answer **05 'VSAQs' out of 06 'VSAQs'**, each carrying 03 Marks, on Credit 01 to 04, for total 15 Marks. One VSAQ will be on each Credit. 2. Student is required to answer **05 'SAQs' out of 06 'SAQs'**, each carrying 05 Marks, on Credit 01 to 04, for total 25 Marks. One SAQ will be on each Credit. 3. Student is required to answer **01 'LAQ' out of 2 LAQs,** of 10 Marks on Credit 01 and Credit 02, for total 10 Marks. LAQ may consist of sub-questions. 4. Student is required to answer **01 'LAQ' out of 2 LAQs,** of 10 Marks on Credit 03 and Credit 04, for total 10 Marks. LAQ may consist of sub-questions. 5. Student is required to answer **01 'LAQ' out of 2 LAQs,** of 10 Marks on Credit 01 to Credit 04, for total 10 Marks. LAQ may consist of sub-questions. 6. Number of attempts: Till Valid Registration Period (VRP) only 7. Marks: 70 Marks 8. Duration: 150 minutes

<table>
<tr><th>SN</th><th>Type of Course</th><th colspan="2">Continuous Assessment (CA)</th><th>End Examination (EE)</th></tr>
<tr><td></td><td></td><td colspan="3">
<table>
<tr><th>SN</th><th>Description</th><th>Evaluation of End Examination (EE)</th><th>Marks</th></tr>
<tr><td rowspan="3">1</td><td rowspan="3">Question Types</td><td>Very Short Answer Question (VSAQ) on each Credit</td><td>03 Marks</td></tr>
<tr><td>Short Answer Question (SAQ) on each Credit</td><td>05 Marks</td></tr>
<tr><td>On each Credit, either Single Long Answer Question (LAQ) or LAQ contains sub-questions (a), (b) and so on.</td><td>10 Marks</td></tr>
<tr><td>2</td><td>Grand Total Marks</td><td>Total five Questions in EE Question paper based on:
Credit 01 to 04 : 05 VSAQs out of 06 VSAQs (15 Marks)
Credit 01 to 04 : 05 SAQs out of 06 SAQs (25 Marks)
Credit 01 to 02 : 01 LAQ out of 02 LAQs (10 Marks)
Credit 03 to 04 : 01 LAQ out of 02 LAQs (10 Marks)
Credit 01 to 04 : 01 LAQ out of 02 LAQs (10 Marks)
LAQ may contains sub-questions</td><td>70 Marks</td></tr>
</table>
</td></tr>
<tr><td>2.</td><td>Theory (T)

2 Credit
50 Marks

CA: 30%
EE: 70%</td><td colspan="2">Each student is required to attempt total 01 (One) “Continuous Assessment (CA)” for each course of each Semester, as per the following details:
1. CA01: 1 (One) ‘Continuous Assessment 01 (CA01)’ on Credit 01 and Credit 02 of each course, consists of
• 1 (One) ‘Short Answer Question (SAQ)’ of 5 Marks
and
• 1 (One) ‘Long Answer Question (LAQ)’of 10 Marks, LAQ may consist of sub-questions.
CA01: On Credit 01 and Credit 02, of Marks = (5 + 10) = 15 Marks
2. Maximum number of attempts for CA, during each semester: Single attempt only
3. Total Marks: 15 Marks</td><td>1. Student is required to answer 05 ‘VSAQs’ out of 06 ‘VSAQs’, each carrying 03 Marks, on Credit 01 to 02, for total 15 Marks. One VSAQ will be on each Credit.
2. Student is required to answer 02 ‘SAQs’ out of 03 ‘SAQs’, each carrying 05 Marks, on Credit 01 to 02, for total 10 Marks. One SAQ will be on each Credit.
3. Student is required to answer 01 ‘LAQ’ out of 2 LAQs, of 10 Marks on Credit 01 and Credit 02, for total 10 Marks. LAQ may consist of sub-questions.
4. Number of attempts: Till Valid Registration Period (VRP) only
5. Marks: 35 Marks
6. Duration: 75 minutes</td></tr>
</table>

<table>
<tr><th>SN</th><th>Type of Course</th><th colspan="3">Continuous Assessment (CA)</th><th colspan="3">End Examination (EE)</th></tr>
<tr><td></td><td></td><td></td><td colspan="5"><table>
<tr><td>SN</td><td>Description</td><td>Evaluation of End Examination (EE)</td><td>Marks</td></tr>
<tr><td rowspan="3">1</td><td rowspan="3">Question Types</td><td>Very Short Answer Question (VSAQ) on each Credit</td><td>03 Marks</td></tr>
<tr><td>Short Answer Question (SAQ) on each Credit</td><td>05 Marks</td></tr>
<tr><td>On each Credit, either Single Long Answer Question (LAQ) or LAQ contains sub-questions (a), (b) and so on.</td><td>10 Marks</td></tr>
<tr><td>2</td><td>Grand Total Marks</td><td>Total three Questions in EE Question paper based on:
Credit 01 to 02: 05 VSAQs out of 06 VSAQs (15 Marks)
Credit 01 to 02: 02 SAQs out of 03 SAQs (10 Marks)
Credit 01 to 02: 01 LAQ out of 02 LAQs (10 Marks)
LAQ may contains sub-questions</td><td>35 Marks</td></tr>
</table></td></tr>
</table>

<table>
<tr><th>SN</th><th>Type of Course</th><th>Continuous Assessment (CA)</th><th>End Examination (EE)</th></tr>
<tr><td>3.</td><td>Practical (P)

4 Credit
100 Marks

CA: 50%
EE: 50%</td><td>1. Student is required to submit “Activity Report in Work-Book Format” for each Credit in the prescribed format.
2. Maximum number of attempts for each CA, during each semester: Single attempt only
3. Marks: 50 Marks
4. Grading criteria:
<table>
<tr><td>Lab Punctuality, Preparedness & Ethics</td><td>Irregular in lab. Copies the experiment from others
(0 Points)</td><td>Consistently regular but unable to explain the concepts
(06 Points)</td><td>Punctuality in lab. Follows the procedure and responds to questions asked
(10 Points)</td></tr>
<tr><td>Activity Report and Performance

(Experiment No, Date, Objectives, Apparatus with specification, Observations, Graphs, software used if any)</td><td>Poor Documentation and copied the experiment from others. Couldn't perform the Activity /poor observation made
(04 Points)</td><td>Average Documentation: Report is in format but some of the formatting guidelines are missed. Performed the Activity but observations made with some mistakes
(12 Points)</td><td>Good Documentation: Lab activity writing is in proper format with all references, Grammar. Performed the Activity on time observations made with no mistakes
(20 Points)</td></tr>
<tr><td>Results and Conclusion</td><td>Unable to achieve the desired results but makes attempts to relate data to theory. Poor concluding statements
(08 Points)</td><td>Average graphical and tabulated representation with misinterpret physical significance of theory. Achieve the desired results and but insufficient conclusion statement.
(14 Points)</td><td>Analyses and interpret observed data carefully with good graphical and tabulated representation using appropriate theory/evidence. Achieve the results and reach to appropriate Conclusion
(20 Points)</td></tr>
</table></td><td>External and internal examiners shall assess each student based on:
1. Workbook/Activity Report submission by the student (Only by External Examiner) [05 Marks]
2. Practical Activity performed by the student [12 Marks]
3. Result and Conclusion of the Practical Activity [13 Marks]
4. Viva-Voce on Practical Activities [20 Marks]
5. Number of attempts: Till Valid Registration Period (VRP) only
6. Marks: 50 Marks
7. Duration: 180 minutes</td></tr>
</table>

<table>
<tr><th>SN</th><th>Type of Course</th><th colspan="2">Continuous Assessment (CA)</th><th colspan="3">End Examination (EE)</th></tr>
<tr><td></td><td></td><td></td><td colspan="4"><table>
<tr><td rowspan="2">SN</td><td colspan="3">Evaluation of Practical End Examination</td></tr>
<tr><td>Description</td><td>Internal Examiner</td><td>External Examiner</td></tr>
<tr><td>1</td><td>Workbook/Activity Report</td><td>-</td><td>05 Marks</td></tr>
<tr><td>2</td><td>Actual Conduct of one randomly selected Practical Activity</td><td>02 Marks</td><td>10 Marks</td></tr>
<tr><td>3</td><td>Diagram, Synoptic Answers, Graph/Observation and Conclusion</td><td>03 Marks</td><td>10 Marks</td></tr>
<tr><td>4</td><td>Viva-Voce/Oral</td><td>05 Marks</td><td>15 Marks</td></tr>
<tr><td>5</td><td>Total</td><td>10 Marks</td><td>40 Marks</td></tr>
</table></td></tr>
</table>

<table>
<tr><th>SN</th><th>Type of Course</th><th>Continuous Assessment (CA)</th><th>End Examination (EE)</th></tr>
<tr><td>4.</td><td>Practical (P)

2 Credit
50 Marks

CA: 50%
EE: 50%</td><td>
1. Student is required to submit “Activity Report in Work-Book Format” for each Credit in the prescribed format.
2. Maximum number of attempts for each CA, during each semester: Single attempt only
3. Marks: 25 Marks
4. Grading criteria:
<table>
<tr><td>Lab Punctuality, Preparedness & Ethics</td><td>Irregular in lab. Copies the experiment from others
(0 Points)</td><td>Consistently regular but unable to explain the concepts
(03 Points)</td><td>Punctuality in lab. Follows the procedure and responds to questions asked
(05 Points)</td></tr>
<tr><td>Activity Report and Performance

(Experiment No, Date, Objectives, Apparatus with specification, Observations, Graphs, software used if any)</td><td>Poor Documentation and copied the experiment from others.
Couldn’t perform the Activity /poor observation made
(02 Points)</td><td>Average Documentation: Report is in format but some of the formatting guidelines are missed. Performed the Activity but observations made with some mistakes
(06 Points)</td><td>Good Documentation: Lab activity writing is in proper format with all references, Grammar.
Performed the Activity on time observations made with no mistakes
(10 Points)</td></tr>
<tr><td>Results and Conclusion</td><td>Unable to achieve the desired results but makes attempts to relate data to theory. Poor concluding statements
(04 Points)</td><td>Average graphical and tabulated representation with misinterpret physical significance of theory. Achieve the desired results and but insufficient conclusion statement.
(07 Points)</td><td>Analyses and interpret observed data carefully with good graphical and tabulated representation using appropriate theory/evidence. Achieve the results and reach to appropriate Conclusion
(10 Points)</td></tr>
</table>
</td><td>
1. External and internal examiners shall assess each student based on:
a. Workbook/Activity Report submission by the student (Only by External Examiner) [05 Marks]
b. Practical Activity performed by the student [06 Marks]
c. Result and Conclusion of the Practical Activity[07 Marks]
d. Viva-Voce on Practical Activities [07 Marks]
2. Number of attempts: Till Valid Registration Period (VRP) only
3. Marks: 25 Marks
4. Duration: 180 minute
</td></tr>
</table>

<table>
<tr><th>SN</th><th>Type of Course</th><th>Continuous Assessment (CA)</th><th>End Examination (EE)</th></tr>
<tr><td></td><td></td><td>
<table>
<tr><td rowspan="2">SN</td><td colspan="3">Evaluation of Practical End Examination</td></tr>
<tr><td>Description</td><td>Internal Examiner</td><td>External Examiner</td></tr>
<tr><td>1</td><td>Workbook/Activity Report</td><td>-</td><td>05 Marks</td></tr>
<tr><td>2</td><td>Actual Conduct of one randomly selected Practical Activity</td><td>01 Marks</td><td>05 Marks</td></tr>
<tr><td>3</td><td>Diagram, Synoptic Answers, Graph/Observation and Conclusion</td><td>02 Marks</td><td>05 Marks</td></tr>
<tr><td>4</td><td>Viva-Voce/Oral</td><td>02 Marks</td><td>05 Marks</td></tr>
<tr><td></td><td>Total</td><td>05 Marks</td><td>20 Marks</td></tr>
</table>
</td><td></td></tr>
<tr><td>5.</td><td>Term Work (TW)

2 Credit
50 Marks

CA: 50%
EE: 50%

For SEC & VSC courses</td><td>1. Student is required to submit “Activity Report in Work-Book Format” for each Credit in the prescribed format.
2. Maximum number of attempts for each CA, during each semester : Single attempt only
3. Marks: 25 Marks
4. Grading Criteria:
<table>
<tr><td>Lab Punctuality, Preparedness & Ethics</td><td>Irregular in lab. Copies the experiment from others (0 Points)</td><td>Consistently regular but unable to explain the concepts (03 Points)</td><td>Punctuality in lab. Follows the procedure and responds to questions asked (05 Points)</td></tr>
<tr><td>Activity Report and Performance

(Experiment No, Date, Objectives, Apparatus with specification, Observations, Graphs, software used if any)</td><td>Poor Documentation and copied the experiment from others. Couldn't perform the Activity /poor observation made (02 Points)</td><td>Average Documentation: Report is in format but some of the formatting guidelines are missed. Performed the Activity but observations made with some mistakes (06 Points)</td><td>Good Documentation: Lab activity writing is in proper format with all references, Grammar. Performed the Activity on time observations made with no mistakes (10 Points)</td></tr>
<tr><td>Results and Conclusion</td><td>Unable to achieve the desired results but makes attempts to relate data to theory. Poor concluding statements (04 Points)</td><td>Average graphical and tabulated representation with misinterpret physical significance of theory. Achieve the desired results and but insufficient conclusion statement. (07 Points)</td><td>Analyses and interpret observed data carefully with good graphical and tabulated representation using appropriate theory/evidence. Achieve the results and reach to appropriate Conclusion (10 Points)</td></tr>
</table>
</td><td>1. External and internal examiners shall assess each student based on:
a. Workbook/Activity Report submission by the student (Only by External Examiner) [05 Marks]
b. Viva-Voce on Practical Activities [20 Marks]
2. Number of attempts: Till Valid Registration Period (VRP) only
3. Marks: 25 Marks
4. Duration: 180 minutes</td></tr>
</table>

<table>
<tr><th>SN</th><th>Type of Course</th><th>Continuous Assessment (CA)</th><th>End Examination (EE)</th></tr>
<tr><td></td><td></td><td>
<table>
<tr><td rowspan="2">SN</td><td colspan="3">Evaluation of Practical End Examination</td></tr>
<tr><td>Description</td><td>Internal Examiner</td><td>External Examiner</td></tr>
<tr><td>1</td><td>Workbook/Activity Report</td><td>-</td><td>05 Marks</td></tr>
<tr><td>2</td><td>Viva-Voce/Oral</td><td>05 Marks</td><td>15 Marks</td></tr>
<tr><td></td><td>Total</td><td>05 Marks</td><td>20 Marks</td></tr>
</table>
</td><td></td></tr>
<tr><td>6.</td><td>Field Project (TW)

2 Credit
50 Marks

CA: 100%</td><td>Students need to complete Field Project (Total Study hours 60 hrs including Activity Report) related to selected Major. After completion of the field project, learners shall submit a report to the LSC – Programme Coordinator (PC) and Mentor/Guide.
1. Maximum number of attempts for each CA, during each semester: Single attempt only
2. Duration: Minimum 15 days or 2 Weeks duration – Any month during the semester 3 & semester 5 of UG programme
3. Marks: 50 Marks
4. Grading Criteria for Evaluation of FP (only by Internal Examiner - Programme Coordinator (PC)/ Supervisor of LSC):
<table>
<tr><td>SN</td><td>Description</td><td>Marks</td></tr>
<tr><td>1</td><td>Key Definitions of Problem area and analysis of preliminary data</td><td>10</td></tr>
<tr><td>2</td><td>Work related to formats, Correspondence, Interactions and liaising etc</td><td>05</td></tr>
<tr><td>3</td><td>Field work and data collection, Analysis</td><td>10</td></tr>
<tr><td>4</td><td>Feedback to community</td><td>05</td></tr>
<tr><td>5</td><td>Report submission</td><td>10</td></tr>
<tr><td>6</td><td>Viva-Voce /Oral</td><td>10</td></tr>
<tr><td colspan="2">Total</td><td>50</td></tr>
</table>
</td><td>End Examination is Not Applicable (NA)</td></tr>
</table>

<table>
<tr><th>SN</th><th>Type of Course</th><th>Continuous Assessment (CA)</th><th>End Examination (EE)</th></tr>
<tr><td>7.</td><td>OJT or Internship (TW)

4 Credit
100 Marks

CA: 50%
EE: 50%</td><td>
1. Students need to complete one month On Job Training (OJT) or Internship related to selected Major (Total Study hours 120 hrs including Internship Report) in any Industry / Organization / Institute/ R&D Division/ Any Micro/ Small/ Medium/ enterprise/ Govt/NGO/PSU/Online Internship related to Major course.
2. Maximum number of attempts for each CA, during each semester: Single attempt only
3. Marks: 50 Marks
4. Duration: 1 Month or 4 Weeks duration – Any one month within semester duration, but before end examination of that particular semester
5. Grading Criteria for Evaluation of OJT (or Intern) only by Mentor where the Internship is proposed to be imparted:
<table>
<tr><th>SN</th><th>Parameters</th><th>Marks Out of</th></tr>
<tr><td>1</td><td>Behaviors, Shows interest in assigned work, Willingness to learn</td><td>10</td></tr>
<tr><td>2</td><td>Accepts responsibility, Cooperates with co-workers and supervisors, Demonstrates organizational skills</td><td>10</td></tr>
<tr><td>3</td><td>Uses time, knowledge and expertise effectively, Analyzes problems effectively</td><td>10</td></tr>
<tr><td>4</td><td>Demonstrates creativity/ originality / any innovative contribution, Professional ethics and accountability</td><td>10</td></tr>
<tr><td>5</td><td>Writes effectively, Produces high quality work/Skill Proficiency</td><td>10</td></tr>
<tr><td colspan="2">Total</td><td>50</td></tr>
</table>
Document as Evidence: Activity report along with Certificate or Declaration, duly issued and signed by the concerned authority [To be assessed during EE] should be submitted during End Examination to the parent Learner support Centre (LSC).
</td><td>
At the end of second semester, Programme Coordinator (PC)/ Supervisor of LSC and 1 (one) External Examiner will complete ‘End Exam (EE)’ for all allotted students as follows:
1. Duration of EE: After Theory EE of second Semester
2. Programme Coordinator (PC)/ Supervisor of LSC and External Expert will have 20% and 80% weightage respectively in EE.
3. Number of attempts: Till Valid Registration Period (VRP) only
4. Marks for EE: 50 Marks
<table>
<tr><th>Parameter</th><th>PC /Supervisor of LSC</th><th>External Expert</th></tr>
<tr><td>Professional Attitude</td><td>-</td><td>05 Marks</td></tr>
<tr><td>Maintenance of Daily Diary</td><td>-</td><td>10 Marks</td></tr>
<tr><td>Internship Report</td><td>05 Marks</td><td>10 Marks</td></tr>
<tr><td>Viva/Oral</td><td>05 Marks</td><td>15 Marks</td></tr>
<tr><td>Total</td><td>10 Marks</td><td>40 Marks</td></tr>
</table>
</td></tr>
</table>

<table>
<tr><th>SN</th><th>Type of Course</th><th>Continuous Assessment (CA)</th><th>End Examination (EE)</th></tr>
<tr><td rowspan="2">8.</td><td rowspan="2">CEP (TW)

2 Credit
50 Marks

CA: 100%</td><td>1. CEP Proposals*: 15 Marks
2. Planning community work, correspondence, formats, interactions, liaising: 10 Marks
3. CEP report**: 15 marks
4. Viva /Presentation: 10 Marks
Marks: 50 Marks</td><td>End Examination is Not Applicable (NA)</td></tr>
<tr><td colspan="2">*CEP Proposals: 1) Basic structure of Society
2) Key definitions of Problem area
3) Analysis of Preliminary data

**CEP Report: 1) Field work and data gathering
2) Analysis and reporting</td></tr>
</table>

Appendix – IV

<table>
<tr><th>SN</th><th colspan="3">Academic Qualifications required for Eligibility</th></tr>
<tr><td rowspan="2">A)</td><td colspan="3">A candidate who has passed Standard 12th / (10+2)th / Level 4.0 examination conducted by Maharashtra State Board of Secondary and Higher Secondary Education/CBSE/ ISC/NIOS or equivalent examinations by any Other State or any other recognized Board with science subjects shall be eligible for admission to First Semester B. Sc. Programmes as per NEP 2020:</td></tr>
<tr><td colspan="2">Groups of Science subjects/courses from</td><td>Eligible for Any One Major in Science Discipline</td></tr>
<tr><td>1.</td><td colspan="2">1. English
2. Physics, Chemistry, Mathematics, Biology</td><td>Any One Major from: Physics, Chemistry, Mathematics, Botany, Zoology, Environmental Science</td></tr>
<tr><td>2.</td><td colspan="2">1. English
2. Physics, Chemistry, Mathematics</td><td>Any One Major from: Physics, Chemistry, Mathematics, Environmental Science</td></tr>
<tr><td>3.</td><td colspan="2">1. English
2. Physics, Chemistry, Biology</td><td>Any One Major from: Physics, Chemistry, Botany, Zoology, Environmental Science</td></tr>
<tr><td>4.</td><td colspan="2">1. English
2. Vocational Course of 200 Marks
3. Physics, Chemistry, Mathematics</td><td>Any One Major from: Physics, Chemistry, Mathematics, Environmental Science</td></tr>
<tr><td>5.</td><td colspan="2">1. English
2. Vocational Course of 200 Marks
3. Physics, Chemistry, Biology</td><td>Any One Major from: Physics, Chemistry, Botany, Zoology, Environmental Science</td></tr>
<tr><td rowspan="3">6.</td><td rowspan="3">1. English
2. Physics, Chemistry</td><td>3. Any one of the following Optional Course of 100 Marks:

Geography, Geology, Food Science and Technology, Agriculture Science and Technology, Animal Science and Technology, Defence Studies</td><td>Any One Major from: Physics, Chemistry, Environmental Science</td></tr>
<tr><td>3. Any one of the following Optional Course of 100 Marks:

Food Science and Technology, Agriculture Science</td><td>Major: Botany</td></tr>
<tr><td>3. Optional Course of 100 Marks: Animal Science and Technology</td><td>Major: Zoology</td></tr>
<tr><td colspan="4">OR</td></tr>
<tr><td rowspan="2">B)</td><td colspan="3">A candidate who has passed (10+3) years or (12+2) years Diploma from Maharashtra State Technical Board / a statutory or recognized board/ university in India</td></tr>
<tr><td colspan="2">Description</td><td>Eligible for Any One Major in Science Discipline</td></tr>
<tr><td>1.</td><td colspan="2">(10+3) years / (12+2) years Engineering Diploma</td><td>Any One Major from: Physics, Chemistry, Mathematics, Environmental Science</td></tr>
<tr><td colspan="4">OR</td></tr>
<tr><td rowspan="2">C)</td><td colspan="3">A candidate who has passed Higher Secondary School Certificate (10+2) Examination with English and any of the following +2 Level HSC Vocational (MCVC) Group</td></tr>
<tr><td colspan="2">HSC Vocational (MCVC) Group</td><td>Eligible for Any One Major in Science Discipline</td></tr>
<tr><td rowspan="4">1.</td><td rowspan="4">Agriculture Group or Fisheries Group</td><td>Horticulture (KA, KB, KC)</td><td rowspan="2">Any One Major from:
Botany, Environmental Science</td></tr>
<tr><td>Crop Science (LA, LB, LC)</td></tr>
<tr><td>Animal Husbandry and Dairy Technology (MA, MB, MC)</td><td rowspan="2">Any One Major from:
Zoology, Environmental Science</td></tr>
<tr><td>Fisheries Technology (NA, NB, NC)</td></tr>
</table>

SN	Academic Qualifications required for Eligibility		
2.	Catering and Food Products Technology	Catering and Food Products Technology (SA, SB, SC)	**Any One Major from:** Botany, Zoology, Environmental Science
3.	Paramedical Group	Child, Old Age and Health care services (QA, QB, QC)	**Any One Major from:** Botany, Zoology, Environmental Science
		Medical Laboratory Technician (OA, OB, OC)	**Any One Major from:** Physics, **Chemistry,** Zoology
		Ophthalmic Technician (RA, RB, RC)	**Major:** Physics
		Radiology Technician (PA, PB, PC)	
4.	Technology Group	Electronics Technology (EA, EB, EC)	**Major:** Physics
		Electrical Technology (FA, FB, FC)	

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