YASHWANTRAO CHAVAN MAHARASHTRA OPEN UNIVERSITY

SCHOOL OF COMPUTER SCIENCE

UGP08: Bachelor of Computer Applications
{2026 Pattern}
SYLLABUS
Semester I

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SYLLABUS

With effect from Academic Year 2025-26, vide G.R. No. NEP-2022/CR No. 09/VISHI-3/शिकाना, dated 20-April-2023.

Yashwantrao Chavan Maharashtra Open University
Dnyangangotri, Near Gangapur Dam,
Nashik – 422 222

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School of Computer Science

Director of the School:

Prof. Chetana Kamlaskar (I/C) (from 31-January-2026)

Mr. Madhav Palshikar (till 31-January-2026)

Programme Advisory Committee Members

UGP05: Bachelor of Computer Applications {2025 Pattern} and Open Elective Courses

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- **Uploaded** on University Website on 12-September-2026

PAC meeting held on 13-March-2025.
School Council Meeting held 05-June-2025 (B-1/F-178/2025/04: Syllabus)
Academic Council Meeting held on 21-July-2025 (Approval for School Council meeting held on 05-June-2025) (Item No. 68.3.7).

SYLLABUS FOR UGP08: Bachelor of Computer Applications {2026 Pattern}

About the Programme:

Programme Code: UGP08
Programme Name: Bachelor of Computer Applications {2026 Pattern}

In today's digital world, computers and information technology play an important role in almost every field including education, business, healthcare, banking, communication, transportation, entertainment, and government services. The BCA programme has been designed to prepare students for this rapidly growing technological environment by providing strong theoretical knowledge along with practical computer skills.
The BCA programme is a three-year undergraduate degree programme that aims to develop competent IT professionals with sound knowledge of computer applications, programming, software development, database systems, networking, web technologies, and emerging computing concepts. The programme focuses on both academic learning and skill development so that students become capable of handling real-world technological challenges.
The School of Computer Science believes that quality computer education should be accessible to all learners irrespective of their geographical location or professional background. Through the flexible learning system of the university, students are provided an opportunity to pursue higher education while continuing their personal, professional, or social responsibilities.

This programme is designed to achieve the following objectives, outcomes, and scope.

Objectives of the Programme

The objectives of the Bachelor of Computer Applications programme are:

- To provide students with fundamental and advanced knowledge in computer science and computer applications.
- To develop programming, analytical, and problem-solving abilities among learners.
- To create awareness about modern information technologies and their applications in various sectors.
- To equip students with practical skills required for software development, database management, networking, and web technologies.
- To prepare students for employment opportunities in the Information Technology industry.
- To encourage logical thinking, creativity, innovation, and continuous learning.
- To prepare students for higher studies and research in computer science and related disciplines.
- To make quality computer education available through flexible and learner-friendly open and distance learning mode.

Programme Outcomes (POs):

After successful completion of this programme, students will be able to:

- Apply Computer Science Fundamentals
- Develop Proficiency in Programming and Software Development
- Manage Databases and Data Analytics
- Understand Computer Networks and Cybersecurity
- Work with Artificial Intelligence and Emerging Technologies
- Engage in Lifelong Learning and Career Advancement

Scope of the Programme:

After successful completion of the BCA programme, students can explore career opportunities in various areas such as:

- Software Development
- Web Development
- Mobile Application Development
- Database Administration
- Computer Networking
- System Administration
- Cybersecurity
- Data Analytics
- Cloud Computing

Graduates of the programme may work in software companies, educational institutions, banks, government organizations, private industries, IT service companies, startups, and various digital enterprises.

The programme also provides a strong foundation for higher education.

Basic Information:

1. **Mode of Education**: Blended Mode
2. **Learner Support Centers/ Study Centers:** University approved LSC/SCs.
3. **Medium of Instruction**: English
4. **Teaching-Learning**: 15 working weeks per semester
5. **Total Teaching-Learning Support: 550** hours in each semester.
6. **Total Courses: Minimum 57 and Maximum 58** courses (subjects) for **3 Years** under Graduate degree

Semester	Minimum	Maximum
I	10	10
II	10	10
III	11	11
IV	9	9
V	8	9
VI	9	9
Total →	57	58

7. **Total Credits: 132** Credits for 3 years Under Graduate degree

   As per UGC norms 1 Credit means 30 hours of study efforts required to gain learning of particular content of each credit.
8. **Semester Credits**: 22 Credits in each semester
9. **Passing**: Minimum 40%
10. **Continuous Assessment**: Continuous Assessment conducted for Continuous evaluation during teaching-learning for 30% Weightage Theory type of courses, 50% weightage for Practical type of courses and 100% weightage for CC, CEP, FP type of courses.
11. **End Exam**: End Examination conducted for Summative evaluation of the student for 70% Weightage for Theory type of courses and for 50% Weightage for practical, type of courses.
12. **Multiple Entry Multiple Exit Option**:

    Compliance with MS G.R. No. NEP-2022/CR No. 09/VISHI-3/शिकाना, dated 20-April-2023.

Sr. No.	Level of the Programme	Entry Option (with criteria) [Note: As per BCA Prospectus June 2026]	Exit Option (with criteria)
1	Certificate Level	1. Qualifying marks in Common Entrance Test conducted by the university AND 2. Passed any one of the following examinations from a recognized Board/University/Institution: a) Passed Higher Secondary Certificate (HSC) Examination (12th / 10+2) or NSQF Level 4.0 examination conducted by Maharashtra State Board of Secondary and Higher Secondary Education, Central Board of Secondary Education (CBSE), Council for the Indian School Certificate Examinations (ICSE), National Institute of Open Schooling (NIOS), or any equivalent examination conducted by a recognized Board/Authority in India, with English as passing subjects. **OR** b) Three-year Engineering Diploma after SSC (10^{th}) i.e. (10+3) or two-year Engineering Diploma after HSC (12^{th}) i.e. (12+2) from a recognized Technical Board or Polytechnic Institution in India. **OR** c) Higher Secondary Vocational (MCVC) Examination in Technical group with English as passing subjects. **OR**	Exit option: Award of UG Certificate in the Faculty of Computer Science – Computer Applications (Level 4.5) with 44 credits and an additional 4 credits core NSQF course/Internship OR Continue with Major and Minor

		Passed Two-year ITI programme after SSC (10^{th}) of NSQF Level 4.0 from a recognized Industrial Training Institute with English.	
2	Diploma Level	UG Certificate in the Faculty of Computer Science – Computer Applications (Level 4.5) with 44 credits and an additional 4 credits core NSQF course/Internship OR Continue with Major and Minor	Exit option: Award of UG Diploma in the Faculty of Computer Science - Computer Applications (Level 5.0) with 88 credits and an additional 4 credits core NSQF course/ Internship OR Continue with Major and Minor
3	Degree Level	UG Diploma in the Faculty of Computer Science - Computer Applications (Level 5.0) with 88 credits and an additional 4 credits core NSQF course/ Internship OR Continue with Major and Minor	Exit option: Award of UG Degree in Computer Applications (Level 5.5) with 132 credits

13. **Certification:** Min "P(Pass)" or better grade in all courses (subjects) of total **132** credits at Semesters 01-06 for Under Graduate Programme.
14. **Curriculum Design**: Student centric curriculum is designed to enable professional ability, employability and skill enhancement.
15. **Approval/Equivalence Status**: UGC and DEB recognized and approved [AY 2023 and onwards] with UGC/DEB letter F.No. 30-30/2023 (DEB-II), Dated: 13.11.2024, available at https://deb.ugc.ac.in/pdf/HomePageRecognitionDetail/140/140_upload_RecognitionDetails_202502181 45348.pdf

PROGRAMME STRUCTURE AND CREDIT DISTRIBUTION OF BACHELOR OF COMPUTER APPLICATIONS (2026 Pattern)

BCA {2026 Pattern} - First Year

Level	Semester	Major		Minor	OE	VSC, SEC (VSEC)	AEC, VEC, IKS	OJT, FP, CEP, CC, RP	Cum. Cr./ Sem.	Degree/ Cum. Cr.
		Mandatory	Electives							
4.5	I	4- 6 (4+2)	-	-	2+2	VSC:2, SEC:2	AEC:2, VEC:2,IKS:2	CC:2	20-22	UG Certificate 40-44
	I	BCAC121: Problem Solving Techniques (Theory - 2 credits) **AND** BCAC102: Mathematics (Theory – 4 credits)	-	-	XXXE101: Select from other faculty OE courses List (Theory – 2 credits) **AND** XXXE102: Select from other faculty OE courses List (Theory – 2 credits)	**VSC: 2** BCAV101: Lab on Problem Solving Techniques (Practical – 2 credits) **AND** **SEC: 2** BCAS101: Advanced Excel (Practical – 2 credits)	**AEC: 2** AECL101: Listening and Speaking Skills in English (Theory – 2 credits) **AND** **VEC: 2** VECD101: Introduction to the Constitution of India (Theory – 2 credits) **AND** **IKS: 2** **Select any one from IKSK104 and IKSK105** 1. IKSK104: भारतीय ज्ञान परंपरेच्या अनुषंगाने विज्ञान आणि तंत्रज्ञान (Theory – 2 credits) **OR** 2. IKSK105: Indian Knowledge System – Generic (2 credits) (Offered in Online Mode)	**CCRX101** to **CCRX106** (2 credits)	-	
	Credits	**2+4=6**	**-**	**-**	**2+2=4**	**2+2=4**	**2+2+2=6**	**2**	**6+4+4+6+2=22**	
	Semester	**Major**		**Minor**	**OE**	**VSC, SEC (VSEC)**	**AEC, VEC, IKS**	**OJT, FP, CEP, CC, RP**	**Cum. Cr./ Sem.**	
		Mandatory	**Electives**							
	II	**4- 6 (4+2)**		**2**	**2+2**	**VSC:2, SEC:2**	**AEC:2, VEC:2**	**CC:2**	**20-22**	
	II	BCAC103: Data Structures using C++ (Theory – 4 credits) **AND** BCAC122: Operating System (Theory – 2 credits)	-	Select any **ONE** Minor stream from 1. Artificial Intelligence 2. Internet of Things Choose any **ONE** from **AISM101** and **IOTM101** AISM101: Fundamentals of AI (Theory – 2 credits) **OR** IOTM101: Fundamentals of IoT (Theory – 2 credits)	XXXE103: Select from other faculty OE courses List (Theory – 2 credits) **AND** XXXE104: Select from other faculty OE courses List (Theory – 2 credits)	**VSC: 2** BCAV102: Lab on Data Structures using C++ (Practical - 2 credits) **SEC: 2** BCAS102: Lab on Web Technology (Practical – 2 credits)	**AEC: 2** AECL102: Reading and Writing Skills in English (Theory – 2 credits) **AND** **VEC: 2** VECD102: Environmental Education (Theory – 2 credits)	**CCRX107** to **CCRX112** (2 credits)		
		4+2=6	**-**	**2**	**2+2=4**	**2+2=4**	**2+2=4**	**2**	**6+2+4+4+4+2=22**	
	I+II	**6+6=12**	**-**	**2**	**4+4=8**	**4+4=8**	**6+4=10**	**2+2=4**	**22+22=44**	
Exit option: Award of UG Certificate in the Faculty of Computer Science – Computer Applications (Level 4.5) with 44 credits and an additional 4 credits core NSQF course/Internship OR Continue with Major and Minor										

BCA {2026 Pattern} - Second Year

Level	Semester	Major		Minor	OE	VSC, SEC (VSEC)	AEC, VEC, IKS	OJT, FP, CEP, CC, RP	Cum. Cr./ Sem.	Degree/ Cum. Cr.
		Mandatory	Electives							
5.0	III	6(4+2)-8(2*4)	-	4	2	VSC:2,	AEC:2	FP:2, CC:2	20-22	UG Diploma 80-88
		BCAC201: Database Management Systems (Theory – 4 credits) **AND** BCAC202: Data Science and IKS (Theory – 2 credits) **AND** BCAC203: Statistics (Theory – 2 credits)		Courses as per any ONE Minor stream selected in **Semester II**, from 1. Artificial Intelligence 2. Internet of Things AISM201: Machine Learning and Deep Learning (Theory – 2 credits) **AND** AISM202: Lab on Machine Learning (Practical – 2 credits) **OR** IOTM201: IoT Hardware and Software (Theory – 2 credits) **AND** IOTM202: Lab on Microcontrollers (Practical – 2 credits)	XXXE201: Select from other faculty OE courses List (Theory – 2 credits)	**VSC: 2** BCAV201: Lab on Database Management Systems (Practical – 2 credits)	**AEC-MIL Course** **Select Any one from AECL201 , AECL203 and AECL205** AECL201: Bhasha Aadhunik Marathi I –Abhyas (Theory – 2 credits) **OR** AECL203: Aadhunik Hindi Bhasha Ka I –Adhyayan (Theory – 2 credits) **OR** AECL205: Urdu Shayari : Kawayed aur Balagat Ka Mutala (Theory – 2 credits)	**FP:2** BCAF204: Field Project (Field Project – 2 credits) **AND** **CC: 2** **CCRX201** to **CCRX206** (2 credits)		
		CSC101: **Cyber Security** (Theory – Non-credit Audit Course)								
	III	**4+2+2=8**	**-**	**2+2=4**	**2**	**2**	**2**	**2+2=4**	**8+4+2+2+2+4=22**	
	Semester	**Major**		**Minor**	**OE**	**VSC, SEC (VSEC)**	**AEC, VEC, IKS**	**OJT, FP, CEP, CC, RP**	**Cum. Cr./ Sem.**	
		Mandatory	**Electives**							
	IV	**6(4+2)-8(2*4)**	**-**	**4**	**2**	**SEC:2**	**AEC:2**	**CEP: 2, CC:2**	**20-22**	
		BCAC205: Python Programming (Theory - 4 credits) **AND** BCAC206: Computer Networks (Theory – 4 credits)	-	Courses as per any ONE Minor stream selected in **Semester II**, from 1. Artificial Intelligence 2. Internet of Things AISM203: Fuzzy Logic and Expert Systems (Theory – 2 credits) **AND** AISM204: Lab on Fuzzy Logic (Practical – 2 credits) **OR** IOTM203: Networking and Connectivity (Theory – 2 credits) **AND** IOTM204: Lab on IoT Network (Practical – 2 credits)	XXXE202: Select from other faculty OE courses List (Theory – 2 credits)	**SEC:2** BCAS201: Lab on Python Programming (Practical - 2 credits)	**AEC – MIL Course** **Select Any one from AECL202 , AECL204 and AECL206** AECL202: Aadhunik Marathi Bhasha II –Abhyas (Theory – 2 credits) **OR** AECL204: Aadhunik Hindi Bhasha Ka II –Adhyayan (Theory – 2 credits) **OR** AECL206: Urdu Nasra : Zuban aur Kawayed Ka Mutala (Theory – 2 credits)	**CEP: 2** BCAG207: Community Engagement Programme (Practical – 2 credits) **AND** **CC:2** **CCRX207** to **CCRX212** (2 credits)		
	IV	**4+4=8**	**-**	**2+2=4**	**2**	**2**	**2**	**2+2=4**	**8+4+2+2+2+4=22**	
	III+IV=	**8+8=16**	**-**	**4+4=8**	**2+2=4**	**2+2=4**	**2+2=4**	**4+4=8**	**22+22=44**	
	FY+SY	**12+16=28**	**-**	**2+8=10**	**8+4=12**	**8+4=12**	**10+4=14**	**4+8=12**	**44+44=88**	
Exit option: Award of UG Diploma in the Faculty of Computer Science - Computer Applications (Level 5.0) with 88 credits and an additional 4 credits core NSQF course/ Internship OR Continue with Major and Minor										

BCA {2026 Pattern} - Third Year

Level	Semester	Major		Minor	OE	VSC, SEC (VSEC)	AEC, VEC, IKS	OJT, FP, CEP, CC, RP	Cum. Cr./ Sem.	Degree/ Cum. Cr.
		Mandatory	Electives							
5.5	V	8(2*4)-10 (2*4 +2)	4	4-6	-	VSC: 2-4	-	FP/CEP: 2	20-22	UG Degree 120-132
		BCAC301: Java Programming (Theory – 4 credits) **AND** BCAC302: Software Engineering (Theory – 4 credits) **AND** BCAC303: Lab on Software Engineering (Practical – 2 credits)	BCAC304: Design and Analysis of Algorithms (4 credits) **OR** BCAC305: Data Warehousing and Data Mining (Theory – 2 credits) **AND** BCAC306: Lab on Data Warehousing and Data Mining (Practical - 2 credits)	Courses as per any ONE Minor stream selected in **Semester II**, from 1. Artificial Intelligence 2. Internet of Things AISM301: Natural Language Processing (NLP) (Theory – 2 credits) **AND** AISM302: Lab on Natural Language Processing (NLP) (Practical – 2 credits) **OR** IOTM301: IoT Data Management and Analytics (Theory – 2 credits) **AND** IOTM302: Lab on IoT Data Management (Practical – 2 credits)	-	VSC - 2 BCAV301: Lab on Java Programming (Practical – 2 credits)	-	BCAF307: Field Project (Field Project – 2 credits) **OR** BCAG308: Community Engagement Programme (2 credits)		
	V	**4+(4+2)=10**	**4**	**2+2=4**	**-**	**2**	**-**	**2**	**10+4+4+2+2=22**	
	VI	**8(2*4)-10 (2*4 +2)**	**4**	**4**	**-**	**-**	**-**	**OJT :4**	**20-22**	
		BCAC321: Advanced Java (Theory – 4 credits) **AND** BCAC322: Lab on Advanced Java (Practical – 2 credits) **AND** BCAC323: Big Data Analytics (Theory – 2 credits) **AND** BCAC324: Lab on Big Data Analytics (Practical – 2 credits)	BCAC325: Cloud Computing (Theory – 2 credits) **And** BCAC326: Lab on Cloud Computing (Practical – 2 credits) **OR** BCAC327: Android Programming (Theory – 2 credits) **And** BCAC328: Lab on Android Programming (Practical – 2 credits)	Courses as per any ONE Minor stream selected in **Semester II**, from 1. Artificial Intelligence 2. Internet of Things AISM303: Generative AI (Theory – 2 credits) **AND** AISM304: Capstone Project on AI **OR** IOTM303: Industrial IoT **AND** IOTM304: Capstone Project on IoT	-	-	-	BCAO329: On Job Training (4 credits)		
	VI	**(4+2)+(2+2)=10**	**2+2=4**	**2+2=4**	**-**	**-**	**-**	**4**	**10+4+4+4=22**	
	V+VI	**8+10=18**	**4+4=8**	**4+4=8**	**-**	**4**	**-**	**2+4=6**	**18+8+8+4+6=44**	
Exit option: Award of UG Degree in Computer Applications (Level 5.5) with 132 credits										

UGP08: BACHELOR OF COMPUTER APPLICATIONS STRUCTURE

A) Structure

First Year - Semester I (Level 4.5)												
Course Code	**Category**	**Course Name**	**Theory/ Practical/ Project**	**Total Study (HRS)**	**Credit Points**	**Medium**	**Assessment Type CA Max**	**Assessment Type CA Min**	**Assessment Type EE/UA Max**	**Assessment Type EE/UA Min**	**Total Marks Max**	**Total Marks Min**
BCAC121	Major Mandatory	Problem Solving Techniques	Theory	60	2	English	15	6	35	14	50	20
BCAC102	Major Mandatory	Mathematics	Theory	120	4	English	30	12	70	28	100	40
XXXE101	Open Elective Course	Select from **other faculty** OE courses List	Theory	60	2	-	15	6	35	14	50	20
XXXE102	Open Elective Course	Select from **other faculty** OE courses List	Theory	60	2	-	15	6	35	14	50	20
BCAV101	VSC	Lab on Problem Solving Techniques	Practical	60	2	English	25	10	25	10	50	20
BCAS101	SEC	Advanced Excel	Practical	60	2	English	25	10	25	10	50	20
AECL101	AEC	Listening and Speaking Skills in English	Theory	60	2	English	15	6	35	14	50	20
VECD101	VEC	Introduction to the Constitution of India	Theory	60	2	English	15	6	35	14	50	20
Select any one from IKSK104 And IKSK105												
IKSK104	IKS	भारतीय ज्ञान परंपरेच्या अनुषंगाने विज्ञान आणि तंत्रज्ञान	Theory	60	2	Marathi	15	6	35	14	50	20
IKSK105	IKS	Indian Knowledge System – Generic	Offered in Online mode		2	Marathi	15	6	35	14	50	20
Select any one from CCRX101 to CCRX106												
CCRX101	CC	Health and Wellness-I	Practical	60	2	-	50	20	-	-	50	20
CCRX102	CC	Yoga Education-I	Practical	60	2	-	50	20	-	-	50	20
CCRX103	CC	Sports and Fitness-I	Practical	60	2	-	50	20	-	-	50	20
CCRX104	CC	Cultural Activities-I	Practical	60	2	-	50	20	-	-	50	20
CCRX105	CC	NSS-I	Practical	60	2	-	50	20	-	-	50	20
CCRX106	CC	Fine/Applied/Visual/Performing Arts-I	Practical	60	2	-	50	20	-	-	50	20
				Total	**22**						**550**	**220**
First Year - Semester II (Level 4.5)												
Course Code	**Category**	**Course Name**	**Theory/ Practical/ Project**	**Total Study (HRS)**	**Credit Points**	**Medium**	**Assessment Type CA Max**	**Assessment Type CA Min**	**Assessment Type EE/UA Max**	**Assessment Type EE/UA Min**	**Total Marks Max**	**Total Marks Min**
BCAC103	Major Mandatory	Data Structures using C++	Theory	120	4	English	30	12	70	28	100	40
BCAC122	Major Mandatory	Operating System	Theory	120	4	English	30	12	70	28	100	40
Select any ONE Minor stream from 1. Artificial Intelligence 2. Internet of Things Choose any ONE from AISM101 and IOTM101												
AISM101	Minor	Fundamentals of AI	Theory	60	2	English	15	6	35	14	50	20
IOTM101	Minor	Fundamentals of IoT	Theory	60	2	English	15	6	35	14	50	20
XXXE103	Open Elective Course	Select from **other faculty** OE courses List	Theory	60	2	-	15	6	35	14	50	20
XXXE104	Open Elective Course	Select from **other faculty** OE courses List	Theory	60	2	-	15	6	35	14	50	20
BCAV102	VSC	Lab on Data Structures using C++	Practical	60	2	English	25	10	25	10	50	20
BCAS102	SEC	Lab on Web Technology	Practical	60	2	English	25	10	25	10	50	20
AECL102	AEC	Reading and Writing Skills in English	Theory	60	2	English	15	6	35	14	50	20
VECD102	VEC	Environmental Education	Theory	60	2	English	15	6	35	14	50	20
Select any one from CCRX107 to CCRX112												
CCRX107	CC	Health and Wellness-II	Practical	60	2	-	50	20	-	-	50	20
CCRX108	CC	Yoga Education-II	Practical	60	2	-	50	20	-	-	50	20
CCRX109	CC	Sports and Fitness-II	Practical	60	2	-	50	20	-	-	50	20
CCRX110	CC	Cultural Activities-II	Practical	60	2	-	50	20	-	-	50	20
CCRX111	CC	NSS-II	Practical	60	2	-	50	20	-	-	50	20
CCRX112	CC	Fine/Applied/Visual/Performing Arts-II	Practical	60	2	-	50	20	-	-	50	20
				Total	**22**						**550**	**220**
Exit option: Award of UG Certificate in the Faculty of Computer Science – Computer Applications (Level 4.5) with 44 credits and an additional 4 credits core NSQF course/Internship OR Continue with Major and Minor												
Second Year - Semester III (Level 5.0)												
Course Code	**Category**	**Course Name**	**Theory/ Practical/ Project**	**Total Study (HRS)**	**Credit Points**	**Medium**	**Assessment Type CA Max**	**Assessment Type CA Min**	**Assessment Type EE/UA Max**	**Assessment Type EE/UA Min**	**Total Marks Max**	**Total Marks Min**
BCAC201	Major Mandatory	Database Management Systems	Theory	120	4	English	30	12	70	28	100	40
BCAC202	Major Mandatory	Data Science and IKS	Theory	60	2	English	15	6	35	14	50	20
BCAC203	Major Mandatory	Statistics	Theory	60	2	English	15	6	35	14	50	20
Continue with the Minor stream as selected in Semester II, from 1. Artificial Intelligence 2. Internet of Things												
AISM201	Minor	Machine Learning and Deep Learning	Theory	60	2	English	15	6	35	14	50	20
AISM202	Minor	Lab on Machine Learning	Practical	60	2	English	25	10	25	10	50	20
IOTM201	Minor	IoT Hardware and Software	Theory	60	2	English	15	6	35	14	50	20
IOTM202	Minor	Lab on Microcontrollers	Practical	60	2	English	25	10	25	10	50	20
XXXE201	Open Elective Course	Select from **other faculty** OE courses List	Theory	60	2	-	15	6	35	14	50	20
BCAV201	VSC	Lab on Database Management Systems	Practical	60	2	English	25	10	25	10	50	20
AEC-MIL Course Select Any one from AECL201 ,AECL203 and AECL205												
AECL201	AEC	I –Aadhunik Marathi Bhasha Abhyas	Theory	60	2	Marathi	15	6	35	14	50	20

AECL203	AEC	–Aadhunik Hindi Bhasha Ka Adhyayan I	Theory	60	2	Hindi	15	6	35	14	50	20
AECL205	AEC	Shayari : Kawayed aur Balagat Ka Urdu Mutala	Theory	60	2	Urdu	15	6	35	14	50	20
BCAF204	Field Project	Field Project	Field Project	60	2	-	50	20	-	-	50	20
Select any one from CCRX201 to CCRX206												
CCRX201	CC	Health and Wellness-III	Practical	60	2	-	50	20	-	-	50	20
CCRX202	CC	Yoga Education-III	Practical	60	2	-	50	20	-	-	50	20
CCRX203	CC	Sports and Fitness-III	Practical	60	2	-	50	20	-	-	50	20
CCRX204	CC	Cultural Activities-III	Practical	60	2	-	50	20	-	-	50	20
CCRX205	CC	NSS-III	Practical	60	2	-	50	20	-	-	50	20
CCRX206	CC	Fine/Applied/Visual/Performing Arts-III	Practical	60	2	-	50	20	-	-	50	20
CSC101	Audit Course	Cyber Security	Theory	-	-	English	15	6	35	14	50	20
				Total	**22**						**550**	**220**

Second Year - Semester IV (Level 5.0)

Course Code	Category	Course Name	Theory/ Practical/ Project	Total Study (HRS)	Credit Points	Medium	Assessment Type CA Max	Assessment Type CA Min	Assessment Type EE/UA Max	Assessment Type EE/UA Min	Total Marks Max	Total Marks Min
BCAC205	Major Mandatory	Python Programming	Theory	120	4	English	30	12	70	28	100	40
BCAC206	Major Mandatory	Computer Networks	Theory	120	4	English	30	12	70	28	100	40
Continue with the Minor stream as selected in Semester II, from 1. Artificial Intelligence 2. Internet of Things												
AISM203	Minor	Fuzzy Logic and Expert Systems	Theory	60	2	English	15	6	35	14	50	20
AISM204	Minor	Lab on Fuzzy Logic	Practical	60	2	English	25	10	25	10	50	20
IOTM203	Minor	Networking and Connectivity	Theory	60	2	English	15	6	35	14	50	20
IOTM204	Minor	Lab on IoT Network	Practical	60	2	English	25	10	25	10	50	20
XXXE202	Open Elective Course	Select from **other faculty** OE courses List	Theory	60	2	-	15	6	35	14	50	20
BCAS201	SEC	Lab on Python Programming	Practical	60	2	English	25	10	25	10	50	20
AEC – MIL Course Select Any one from AECL202 ,AECL204 and AECL206												
AECL202	AEC	–Aadhunik Marathi Bhasha Abhyas II	Theory	60	2	Marathi	15	6	35	14	50	20
AECL204	AEC	Aadhunik Hindi Bhasha Ka II –Adhyayan	Theory	60	2	Hindi	15	6	35	14	50	20
AECL206	AEC	Urdu Nasra : Zuban aur Kawayed Ka Mutala	Theory	60	2	Urdu	15	6	35	14	50	20
BCAG207	CEP	Community Engagement Programme	Practical	60	2	-	50	20	-	-	50	20
Select any one from CCRX207 to CCRX212												
CCRX207	CC	Health and Wellness-IV	Practical	60	2	-	50	20	-	-	50	20
CCRX208	CC	Yoga Education-IV	Practical	60	2	-	50	20	-	-	50	20
CCRX209	CC	Sports and Fitness-IV	Practical	60	2	-	50	20	-	-	50	20
CCRX210	CC	Cultural Activities-IV	Practical	60	2	-	50	20	-	-	50	20
CCRX211	CC	NSS-IV	Practical	60	2	-	50	20	-	-	50	20
CCRX212	CC	Fine/Applied/Visual/Performing Arts-IV	Practical	60	2	-	50	20	-	-	50	20
				Total	**22**						**550**	**220**

Exit option: Award of UG Diploma in the Faculty of Computer Science - Computer Applications (Level 5.0) with 88 credits and an additional 4 credits core NSQF course/ Internship OR Continue with Major and Minor

Third Year - Semester V (Level 5.5)

Course Code	Category	Course Name	Theory/ Practical/ Project	Total Study (HRS)	Credit Points	Medium	Assessment Type CA Max	Assessment Type CA Min	Assessment Type EE/UA Max	Assessment Type EE/UA Min	Total Marks Max	Total Marks Min
BCAC301	Major Mandatory	Java Programming	Theory	120	4	English	30	12	70	28	100	40
BCAC302	Major Mandatory	Software Engineering	Theory	120	4	English	30	12	70	28	100	40
BCAS303	Major Mandatory	Lab on Software Engineering	Practical	60	2	English	25	10	25	10	50	20
Elective Course Select Any one from BCAC304 or (BCAC305 and BCAC306)												
BCAC304	Major Elective	Design and Analysis of Algorithms	Theory	120	4	English	30	12	70	28	100	40
BCAC305	Major Elective	Data Warehousing and Data Mining	Theory	60	2	English	15	6	35	14	50	20
BCAC306	Major Elective	Lab on Data Warehousing and Data Mining	Practical	60	2	English	25	10	25	10	50	20
Continue with the Minor stream as selected in Semester II, from 1. Artificial Intelligence 2. Internet of Things												
AISM301	Minor	Natural Language Processing (NLP)	Theory	60	2	English	15	6	35	14	50	20
AISM302	Minor	Lab on Natural Language Processing (NLP)	Practical	60	2	English	25	10	25	10	50	20
IOTM301	Minor	IoT Data Management and Analytics	Theory	60	2	English	15	6	35	14	50	20
IOTM302	Minor	Lab on IoT Data Management	Practical	60	2	English	25	10	25	10	50	20
BCAV301	VSC	Lab on Java Programming	Practical	60	2	English	25	10	25	10	50	20
Select Any one from BCAF307 or BCAG308												
BCAF307	Field Project	Field Project	Field Project	60	2	English	50	20	-	-	50	20
BCAG308	CEP	Community Engagement Programme	Practical	60	2	-	50	20	-	-	50	20
				Total	**22**	**-**					**550**	**220**

Third Year - Semester VI (Level 5.5)

Course Code	Category	Course Name	Theory/ Practical/ Project	Total Study (HRS)	Credit Points	Medium	Assessment Type CA Max	Assessment Type CA Min	Assessment Type EE/UA Max	Assessment Type EE/UA Min	Total Marks Max	Total Marks Min

BCAC321	Major Mandatory	Advanced Java	Theory	120	4	English	30	12	70	28	100	40
BCAC322	Major Mandatory	Lab on Advanced Java	Practical	60	2	English	10	10	25	10	50	20
BCAC323	Major Mandatory	Big Data Analytics	Theory	60	2	English	15	6	35	14	50	20
BCAC324	Major Mandatory	Lab on Big Data Analytics	Practical	60	2	English	10	10	25	10	50	20
Elective Course Select Any one from (BCAC325 and BCAC326) or (BCAC327 and BCAC328)												
BCAC325	Major Elective	Cloud computing	Theory	60	2	English	15	6	35	14	50	20
BCAC326	Major Elective	Lab on Cloud computing	Practical	60	2	English	25	10	25	10	50	20
BCAC327	Major Elective	Android Programming	Theory	60	2	English	15	6	35	14	50	20
BCAC328	Major Elective	Lab on Android Programming	Practical	60	2	English	25	10	25	10	50	20
Continue with the Minor stream selected in Semester II, from 1. Artificial Intelligence 2. Internet of Things												
AISM303	Minor	Generative AI	Theory	60	2	English	15	6	35	14	50	20
AISM304	Minor	Capstone Project on AI	Practical	60	2	English	25	10	25	10	50	20
IOTM303	Minor	Industrial IoT	Theory	60	2	English	15	6	35	14	50	20
IOTM304	Minor	Capstone Project on IoT	Practical	60	2	English	25	10	25	10	50	20
BCAO329	OJT	On Job Training	On Job Training	120	4	English	50	20	50	20	100	40
				Total	**22**	**-**					**550**	**220**
Exit option: Award of UG Degree in Computer Applications (Level 5.5) with 132 credits												

[**Abbreviations** –

VSC – Vocational Skill Course,

SEC – Skill Enhancement Course,

AEC – Ability Enhancement Course,

VEC – Value Education Course,

IKS – Indian Knowledge System,

CEP – Community Engagement Programme,

OJT – On Job Training,

FP – Field Project,

CC – Co-Curricular]

SEMESTER I

Detailed Syllabus

Course details

Course Code	Course	Category	Course Type	Credits
BCAC121	Problem Solving Techniques	Major (Core)	Theory	2

Learner Support and Academic Components:

No. of Units	Counselling hours	Total Study Hours (Learner)	No. of Assignments (CA)	Continuous Assessment (CA)	End Exam (EE)
8	6	60	1	15 marks	35 marks

1 Counselling = 1 clock hour

Course Outcomes

After successful completion of this course, learners will be able to:

CO1: Explain computer fundamentals and basic problem-solving techniques.

CO2: Apply fundamental concepts of C programming, including data types, operators and expressions.

CO3: Develop simple C programs using input/output, decision-making and looping statements.

CO4: Implement arrays, strings and functions in C programs.

CO5: Demonstrate basic concepts of pointers, structures and file handling.

CO6: Apply storage classes and preprocessor directives and debug simple C programs.

CO–PO Mapping Matrix

Course Outcomes (COs)	PO1	PO2	PO3	PO4	PO5	PO6
CO1	3	1				1
CO2	3	3				1
CO3	2	3				2
CO4	2	3	1			2
CO5	3	2	1			1
CO6	2	3				2

3 = Strong Contribution, 2 = Moderate Contribution, 1 = Slight Contribution, Blank = No Contribution

Syllabus

Unit No.	Title	Details
Unit 1	Introduction to Computers and Problem Solving	• Computer Fundamentals: Introduction to Computers: Characteristics of Computers, Uses of computers, Types and generations of Computers. • Basic Computer Organization: Units of a computer, CPU, ALU, memory hierarchy, registers, I/O devices • Concept of problem solving, Problem definition, Program design • Flowcharting, decision table, algorithms, Structured programming concepts

Unit 2	Introduction to C	• History of C
		• C Basics
		  ○ C character set, tokens, constants, variables, keywords, identifiers
		  ○ C operators- arithmetic, logical, assignment, relational, increment and decrement, conditional, bit wise, special, operator precedence, C expressions data types.
		• Problem solving techniques: flowchart and algorithm

Unit 3	Managing Input & output operations, Decision making	• Reading a character, writing a character, formatted input, formatted output. • Decision making and branching if-statement–if, if- else, else-if ladder, nested if else, switch case statement, break statement
Unit 4	Looping	• Decision making and looping- while, do, do-while statement, for loop, continue statement
Unit 5	Arrays and Strings	• Arrays Declaration and initialization of one dimensional, two Dimensional and character arrays, accessing array elements. • Declaration and initialization of string variables, string handling functions from standard library – strlen(), strcpy(), strcat(), strcmp()
Unit 6	Functions	• Need of functions, scope and lifetime of variables, defining functions, function call, call by value, call by reference, return values, storage classes. category of function- No argument No return value, No argument with return value, argument with return value, recursion, Command Line Arguments

Unit 7	Pointers, Structures, Unions and File handling - introduction	• Understanding pointers, declaring pointer variable, initialization of pointer variable, accessing address of a variable, pointer expressions, Pointers arithmetic • Structures: Defining structure, declaring and accessing structure members, initialization of structure, arrays of structure, Difference between array and structure. • Unions • Introduction to Streams • Type of files • Operation on text files • Standard Library • Input Output function
Unit 8	Storage Classes and the C preprocessor - Basic	• Scope and extent • Storage Classes in a single source file • auto, extern and static, register • Features of C Preprocessor • Macro Expansion • Macros with Arguments • Macros versus Functions • File Inclusion • Conditional Compilation

Course details

Course Code	Course	Category	Course Type	Credits
BCAV101	Lab on Problem Solving Techniques	VSC	Practical	2

Learner Support and Academic Components:

Number of Practical activities	Lab sessions	Total Study Hours (Learner)	Continuous Assessment (CA)	End Exam (EE)
12 Perform any 12 out of 24 based on units given in the theory syllabus	6	60	25 marks	25 marks

1 session = 2 clock hours

Course Outcomes (COs)

CO1: Design logical solutions using flowcharts and algorithms for computational problems.

CO2: Apply decision-making and control structures (if, conditional operators, switch) to solve selection-based problems.

CO3: Implement iterative constructs (loops, recursion) to perform repetitive computations such as factorial, palindrome, and reverse operations.

CO4: Use arrays and strings to solve problems involving searching, sorting, aggregation (sum/average), and matrix operations.

CO5: Apply functions (with parameters, return values, recursion, and call by reference) to develop modular and reusable C programs.

CO–PO Mapping Matrix

	PO1	PO2	PO3	PO4	PO5	PO6
CO1	3	2				2
CO2	2	3				2
CO3	2	3				2
CO4	2	3	2			2
CO5	2	3				2

3 = Strong Contribution, 2 = Moderate Contribution, 1 = Slight Contribution, Blank = No Contribution

Syllabus

Practical No.	Title	Details
1)	Flowchart and Algorithm and basics of 'C	Write an Algorithm, draw a flowchart and write a program to perform the mathematical operations such as addition, subtraction, multiplication, division and mod of two numbers.
2)	Flowchart and Algorithm and basics of 'C	Write an Algorithm, draw a flowchart and write a program to find area and perimeter of a rectangle.
3)	Flowchart and Algorithm and basics of 'C	Write an Algorithm, draw a flowchart and write a program to find area and circumference of a circle.
4)	Flowchart and Algorithm and basics of 'C	Write an Algorithm, draw a flowchart and write a program to find area of triangle given base and height.
5)	Flowchart and Algorithm and basics of 'C	Write an Algorithm, draw a flowchart and write a program to find the sum of the digits of 3-digit number.
6)	Flowchart and Algorithm and basics of 'C	Write an Algorithm, draw a flowchart and write a program to reverse a 3-digit number
7)	Flowchart and Algorithm and basics of 'C	Write an Algorithm, draw a flowchart and write a program to convert a temperature in Fahrenheit (F) to its equivalent in Celsius(C) [c= (f-32)*5/9 , f= 9/5*c+32]
8) **C2 - 8.1**	if statement	Write a program to find greatest among three numbers using if statement.
8) **8.2**	if statement, Conditional operator	Write a program to find greatest among three numbers using conditional operator
9)	Use of switch statement and concept of loops	Write a program to input a character and decide whether it is a vowel or not. Try to use toupper() or tolower() to ignore the character case of the vowels.
10)	concept of loops, for , do-while, while-do	Write a program to calculate factorial of a number.
11)	Use of do-while	Write a program to find sum and average of 'n' numbers.
12) **12.1**	Concept of Arrays	Write a menu driven program to create one dimensional array, display it, find the sum of all the elements, find maximum and minimum element within the array, include the facility to search an element. Finally sort the array.

12) **12.2**	Concept of Arrays	Write a program to create two arrays, find sum and difference of these two matrices.
12) **C3 - 13.1**	Strings	Write a program to implement various string functions.
13) **13.2**	Strings	Write a program to enter a string and decide whether it is palindrome or not.
14) **14.1**	Functions	Write a menu driven program to convert dollars to rupees and rupees to dollars using functions.
14) **14.2**	Functions	Write a program using functions to find reverse of a number and decide whether it is palindrome or not. Develop two functions getnum() and reverse() with proper prototypes.
15)	Recursion	Write a program to calculate factorial of number using recursion.
16)	Pointers	Write a program to swap the values of two variables by using call by reference method in functions.
17)	Structures	Write a program using the concept of array of structures to create a list of students having the following fields rollno, name, marks[3], total Marks should be stored as an integer array.
18)	Unions	Write a program to create a structure stock, having member fields as manufacturer, itemname, desc, (desc must be union either refer to it by size or colour.) Store data for ‘n’ products.
19)	File Handling	Write a program to create a text file “L1.txt“ which stores a line of text till the user presses the enter. Copy this file into “L2.txt“
20) **C4-20**	File Handling	Write a menu driven program to create a structure ‘employee’ having members as empid, name and basic pay. Using functions create(), add(), display() perform various operations.
21)	File Handing	Write a program to create a file org.txt, replace every character in it by its next character, store this file in encrypt.txt.
22)	Storage Classes	Write a program to implement the Concept of storage classes.
23)	Storage classes	Write a program to generate Fibonacci series using functions and, in the function, try to use the concept of static storage class for the first two terms.
24)	C pre-processor	Write a macro ‘design’ to create a pattern using for loop.

Course details

Course Code	Course	Category	Course Type	Credits
BCAC102	Mathematics	Major Mandatory	Theory	4

Learner Support and Academic Components:

No. of Units	Counselling hours	Total Study Hours (Learner)	No. of Assignments (CA)	Continuous Assessment (CA)	End Exam (EE)
14	12	120	2	30 marks	70 marks

1 Counselling = 1 clock hour

Course Outcomes (COs)

CO1: Apply concepts of sets, relations, functions, logic, and mathematical induction to model and analyze computational problems.

CO2: Perform operations with number systems, exponents, surds, logarithms, and algebraic expressions to solve mathematical problems.

CO3: Utilize principles of counting, permutations and combinations, matrices, determinants, linear equations, polynomials, vectors, and quadratic equations in problem-solving.

CO4: Analyze and apply concepts of graph theory and geometry (areas, perimeters, volumes, and surface areas) in mathematical and real-life contexts.

CO–PO Mapping Matrix

	PO1	PO2	PO3	PO4	PO5	PO6
CO1	3	2				2
CO2	3	2				2
CO3	3	3	2			2
CO4	2	2				2

3 = Strong Contribution, 2 = Moderate Contribution, 1 = Slight Contribution, Blank = No Contribution

Syllabus

Unit No.	Title	Details
Unit 1	Set Theory	• Relevance of Mathematics • Set Notations, Types of sets, Set Operations, Properties of Set operations, Venn Diagrams
Unit 2	Number Systems	• Binary Number System, Conversion between Binary and Decimal Number System, Addition and Subtraction of Binary Numbers, Octal Number System, Hexadecimal Number System
Unit 3	Mathematical Induction	• Mathematical Induction: First Principle, Proofs of statements using mathematical induction
Unit 4	Mathematical Logic	• Mathematical Logic: Statement, Truth value of a Statement, Types of logical statements, Types of Compound Statements, Logically Equivalent Statements, Logical Identities, Tautology and Contradiction
Unit 5	Exponents, Surds	• Exponential form and Laws of Exponents • Laws of Fractional Exponents, Surd, Order of Surd, Forms of surds
Unit 6	Logarithms	• Logarithm, Antilogarithm, Conversion to different base, Application of Logarithms in Complex Calculations
Unit 7	Permutations and Combinations	• Addition Principle, Multiplication Principle • Factorial of Number • Permutations and Combinations
Unit 8	Relations	• Cartesian Product of Sets, Relations, Types of Relations • Equivalence Relations and Equivalence Classes • Matrix of a Relation
Unit 9	Functions	• Functions, Types of Functions, Composition of Functions
Unit 10	Vectors	• Vectors, Types of Vectors, Algebra of Vectors, Collinear and Coplanar Vectors
Unit 11	Matrices, Determinants	• Matrix, Types of Matrices, Algebra of Matrices, • Determinants, Inverse of Matrix
Unit 12	Linear Equations, Polynomials	• Linear Equations, System of Linear Equations, Representation in Matrix Form, Cramer's Rule • Polynomials, Operations on Polynomials, Roots of polynomial Equation, Test of Divisibility, Quadratic Equations and their Roots
Unit 13	Introduction to Graph theory	• Graph, Commonly used terminology in Graph Theory, Some important types of Graphs, Representation of Graphs using Matrix, Eulerian and Hamiltonian Graphs
Unit 14	Mensuration	• Areas of Plane Figures, Perimeters of Plane Figures, Volumes of Solid Objects, Surface Areas of Solid Objects

Course details

Course Code	Course	Category	Course Type	Credits
BCAS101	Advanced Excel	SEC	Practical	2

Learner Support and Academic Components:

Number of Practical activities	Lab sessions	Total Study Hours (Learner)	Continuous Assessment (CA)	End Exam (EE)
14	6	60	25 marks	25 marks

1 session = 2 clock hours

Course Outcomes (COs)

CO1: Apply logical, lookup, text, date-time, and array functions to manipulate and analyze data effectively in Excel.

CO2: Utilize data validation, conditional formatting, error handling, PivotTables, and PivotCharts to summarize, visualize, and present datasets.

CO3: Perform advanced data analysis using Power Query, Power Pivot, and DAX to clean, transform, and model large-scale data.

CO4: Automate tasks and develop interactive dashboards using Macros, VBA scripting, and advanced visualization techniques for decision-making.

CO–PO Mapping Matrix

	PO1	PO2	PO3	PO4	PO5	PO6
CO1	3	3	2			2
CO2	2	3	3			2
CO3	2	3	3		2	2
CO4	2	3	2		2	3

3 = Strong Contribution, 2 = Moderate Contribution, 1 = Slight Contribution, Blank = No Contribution

List of Practicals

Practical No.	Practical	Activities
1.	Excel Basics & Interface	Perform data entry, apply filled series, use essential keyboard shortcuts, and navigate worksheet elements (rows, columns, ribbons, tabs).
2.	Data Formatting & Cell Referencing	Format a given dataset (borders, colors, alignment), and apply Absolute, Relative, and Mixed referencing in formulas.
3.	Named Ranges & Basic Arithmetic Functions	Create named ranges and use them with arithmetic functions such as SUM, AVERAGE, MAX, MIN.
4.	Statistical & Logical Functions	Use functions such as COUNT, COUNTA, COUNTIF, AVERAGEIF and logical functions like IF, AND, OR, NOT, Nested IF, IFERROR on a dataset.
5.	LOOKUP & VLOOKUP Functions	Apply LOOKUP, VLOOKUP, Nested VLOOKUP, and HLOOKUP to retrieve data from multiple tables.
6.	Advanced Functions (INDEX, MATCH, INDIRECT)	Use INDEX and MATCH to perform advanced lookups and apply INDIRECT to link formulas dynamically.
7.	Data Validation & Dependent Dropdowns	Create single-level and two-level dependent dropdown lists using Data Validation.
8.	Date & Text Function Applications	Use DATE functions (DAY, MONTH, YEAR, EOMONTH, DATEDIF, YEARFRAC) and Text functions (LEFT, RIGHT, MID, SEARCH, PROPER, CONCAT) to clean and transform data.
9.	Data Cleaning & Handling	Remove duplicates, format inconsistent data, and apply sorting and filtering (basic and advanced filter) to organize a dataset.

10.	Conditional Formatting	Apply conditional formatting using highlight rules, color scales, icon sets, and data bars to visually analyze data patterns.
11.	Creating Basic & Advanced Charts	Create various charts: Bar, Column, Pie, Line, Combo, Waterfall, and Gantt chart for visual representation of data.
12.	Pivot Tables & Pivot Charts	Create Pivot Tables with grouping, calculated fields, and generate Pivot Charts. Use Slicers and Timelines for interactivity.
13.	Power Query — Data Cleaning & Transformation	Import data using Power Query, perform cleaning (split columns, remove errors, trim text), and load transformed data into Excel.
14.	Merging & Appending Queries	Use Power Query to merge multiple tables (Join) and append datasets to create a combined master dataset.

Reference Books

1. Greg Harvey — *Excel All-in-One for Dummies*, Wiley
2. Microsoft Official Excel Documentation
3. Michael Alexander & Richard Kusleika — *Excel 2019 Bible*, Wiley
4. John Walkenbach — *Microsoft Excel Step by Step*, Microsoft Press

Online Resources:

- Microsoft Learn — Excel Training https://learn.microsoft.com/training
- ExcelJet (Formulas & Functions) https://exceljet.net
- Excel Exposure — Free Excel course https://excelexposure.com
- YouTube — Microsoft Excel Official Channel

Course details

Course Code	Course	Category	Course Type	Credits
AECL101	Listening and Speaking Skills in English	AEC	Theory	2

Learner Support and Academic Components:

No. of Units	Counselling hours	Total Study Hours (Learner)	No. of Assignments (CA)	Continuous Assessment (CA)	End Exam (EE)
7	6	60	1	15 marks	35 marks

1 Counselling = 1 clock hour

Course Outcomes (COs)

CO1: Demonstrate effective listening skills by understanding spoken information, viewpoints, and arguments.

CO2: Apply correct pronunciation, stress, and intonation patterns in spoken English.

CO3: Communicate effectively in everyday situations using appropriate conversational expressions.

CO4: Participate confidently in group discussions using suitable language and interaction strategies.

CO5: Demonstrate interview skills including preparation, presentation, and professional communication.

CO6: Use appropriate language and etiquette for telephonic communication in formal and informal contexts.

CO–PO Mapping Matrix

Course Outcomes (COs)	PO1	PO2	PO3	PO4	PO5	PO6
CO1	1					3
CO2						3
CO3	1					3
CO4	1	1				3
CO5		1				3
CO6						3

3 = Strong Contribution, 2 = Moderate Contribution, 1 = Slight Contribution, Blank = No Contribution

Syllabus

Unit No.	Unit Title	Contents / Topics
Unit 1	Listening Skills	Importance of Listening, Listening vs. Hearing, Types of Listening, Note-taking Techniques, Listening & Synthesizing Multiple Viewpoints, Evaluating Arguments & Evidence, Non-verbal Aspects, Barriers to Effective Listening (Physical & People-related), Ten Commandments of Listening.
Unit 2	Spoken English	English Sound System: Vowels, Consonants, Syllables, Stress, Intonation Patterns.
Unit 3	Basic Conversational Skills – I	Speaking Skills for Different Purposes: Greetings & Introductions, Introducing Yourself and Others, Requesting & Responding to Requests, Agreeing & Disagreeing.
Unit 4	Basic Conversational Skills – II	Speaking Skills for Different Purposes: Suggesting, Asking for Information, Seeking & Giving Permissions, Apologizing.
Unit 5	Group Discussion	Participating in a Group Discussion, Language Expressions for GD, Sample GD.
Unit 6	Interview Skills	Types of Interviews, Interview Preparation, Making a Good Impression, Language Expressions for Interview.
Unit 7	Telephonic Communication	Making & Receiving Calls, Putting a Call on Hold, Taking & Leaving Messages, Making Appointments, Asking & Giving Information, Ending a Conversation, Telephonic Etiquettes.

Reference Books:

1. Raymond Murphy — *English Grammar in Use*, Cambridge
2. Liz Hamp-Lyons — *Study Writing*, Cambridge
3. Sanjay Kumar & Pushp Lata — *Communication Skills*, Oxford
4. V. Sasikumar et al. — *A Course in Listening and Speaking*, Cambridge

Online Resources:

- British Council LearnEnglish https://learnenglish.britishcouncil.org
- BBC Learning English https://www.bbc.co.uk/learningenglish
- SWAYAM — Communication Skills courses

Course details

Course Code	Course	Category	Course Type	Credits
VECD101	Introduction to the Constitution of India	VEC	Theory	2

Learner Support and Academic Components:

No. of Units	Counselling hours	Total Study Hours (Learner)	No. of Assignments (CA)	Continuous Assessment (CA)	End Exam (EE)
8 Units (2 books)	6	60	1	15 marks	35 marks

1 Counselling = 1 clock hour

Syllabus

Book	Unit No.	Unit Title	Contents / Topics
Book 1: The Making of the Indian Constitution	Unit 1	Framing of the Constitution	Objectives, Preface/Introduction, British Colonialism, Background to Constitution-making, Framework of New Constitution, Formation & Inclusive Leadership of Constituent Assembly, Ideological Spectrum, Proceedings, Stages of Constitution-making, Glossary, Self-Study Exercises, Summary, References.
	Unit 2	Sources of the Indian Constitution	Objectives, Preface/Introduction, Influences on the Constitution, Sources of the Constitution, Criticism of the Constitution, Self-Study Exercises, Further Reading.
	Unit 3	Fundamental Duties	Objectives, Preface/Introduction, Background & History, Explanation & Importance, Implementation, Criticism, Relationship with Fundamental Rights, Glossary, Self-Study Exercises, Summary, References.
	Unit 4	Indian System of Governance	Objectives, Preface/Introduction, The President, Rajya Sabha, Lok Sabha, Supreme Court, Procedure for Constitutional Amendments, Glossary, Self-Study Exercises, Summary, References.

Book 2: The Indian Constitution: Our Rights and Duties	Unit 1	Fundamental Rights (Background & Judicial Protection)	Objectives, Preface/Introduction, Background & History, Constitutional Provisions, Importance, Judicial Protection, Glossary, Self-Study Exercises, Summary, References.
	Unit 2	Directive Principles of State Policy (DPSP)	Objectives, Preface/Introduction, Background & History, Features, Classification, Constitutional Amendments, Implementation, Criticism, Conflicts with Fundamental Rights, Glossary, Self-Study Exercises, Summary, References.
	Unit 3	Philosophy of the Indian Constitution (Preamble)	Objectives, Preface/Introduction, "We, the People of India", Liberty, Equality, Fraternity, Justice, Democracy, Secularism, Socialism, Glossary, Self-Study Exercises, Summary, References.
	Unit 4	Features of the Indian Constitution	Objectives, Preface/Introduction, Features of the Constitution, Criticism, Glossary, Self-Study Exercises, Summary, References.

Reference Books:

1. Subhash Kashyap — *Our Constitution*, National Book Trust
2. P. M. Bakshi — *The Constitution of India*, Universal Law Publishing
3. D. D. Basu — *Introduction to the Constitution of India*, LexisNexis
4. M. Laxmikanth — *Indian Polity*, McGraw-Hill

Online Resources:

- National Portal of India — Constitution Text https://www.india.gov.in
- PRS Legislative Research https://prsindia.org
- NCERT Political Science Resources https://ncert.nic.in
- SWAYAM — Constitutional Studies courses

Course details

Course Code	Course	Category	Course Type	Credits
IKSK104	भारतीय ज्ञान परंपरेच्या अनुषंगाने विज्ञान आणि तंत्रज्ञान	IKS	Theory	2

Learner Support and Academic Components:

No. of Units	Counselling hours	Total Study Hours (Learner)	No. of Assignments (CA)	Continuous Assessment (CA)	End Exam (EE)
11	6	60	1	15 marks	35 marks

1 Counselling = 1 clock hour

Course Outcomes (COs):

After successful completion of this course, learners will be able to

CO1: Explain the fundamental concepts of Indian Knowledge Systems (IKS) and describe the scientific ideas reflected in Vedas, Vedangas, and ancient Indian literature.

CO2: Describe the contributions of ancient Indian scholars in the fields of astronomy, mathematics, physics, chemistry, agriculture, architecture, and environmental science.

CO3: Analyze traditional Indian scientific knowledge and compare it with modern scientific concepts and developments.

CO4: Interpret the relevance of Indian traditional knowledge systems in present-day sustainable development, environmental conservation, agriculture, and scientific thinking.

CO5: Develop awareness of India's scientific heritage, ethical values, cultural traditions, and interdisciplinary approaches to knowledge and learning.

CO–PO Mapping Matrix

Course Outcomes (COs)	PO1	PO2	PO3	PO4	PO5	PO6
CO1	1					3
CO2	2		1		1	3
CO3	2	1	1		2	3
CO4	1		1		1	3
CO5	1				1	3

3 = Strong Contribution, 2 = Moderate Contribution, 1 = Slight Contribution, Blank = No Contribution

Syllabus:

Unit	Name	Details
1	वेद आणि विज्ञान	• वेद • वेदांचे अध्ययन • वेदांचे वर्गीकरण • वेदांग • वेदांमधील विज्ञान • अन्य आर्ष वैदिक वाङमयात विज्ञान
2	खगोलशास्त्र	• खगोलशास्त्राचा उगम • वेदकालीन खगोलशास्त्र • वेदांग ज्योतिषकालीन खगोलशास्त्र • आधुनिक खगोलशास्त्र • प्राचीनकालीन उपकरणे
3	ज्योतिषशास्त्र	• गणित, दशांक पद्धती • खगोल • त्रिस्कंध ज्योतिष • ज्योतिषाचा उद्देश • कालगणना • गणित व फलित विषय विभाग • अयनगोल विचार
4	स्थापत्यशास्त्र	• स्थापत्यशास्त्र • वास्तुशास्त्र • शास्त्र आधार • जमीन • शिल्पज्ञ व त्यांचे मदतनीस • मोजमाप • मालची निवड • पाया • जमीन परीक्षा (भूमी परीक्षा) • देऊळ • किल्ले • बारव • नगर – व्यवस्थाशास्त्र • नाट्य शास्त्र
5	गणितशास्त्र	• बौधायन • आचार्य पिंगला • आर्यभट

		• आचार्य वराहमिहिर • आचार्य ब्रह्मगुप्त • पहिला भास्कराचार्य • श्रीधराचार्य • महाविराचार्य • दुसरा भास्कराचार्य • माधव (माधवन) • भारतीय गणितशास्त्राच्या वैशिष्ट्यांची माहिती
6	भूगर्भ शास्त्र	• प्रागैतिहासिक काळातील उत्पत्ती • भारतातील भू-पुराणकथा आणि भूगर्भशास्त्र • भारतातील प्राचीन खाण काम • जलमंडल / जलावरण
7	रसायनशास्त्र	• पार्श्वभूमी • ऐतिहासिक माहिती • पारा • जस्त • लोह • विविध भस्मे • आसव
8	भौतिकशास्त्र	• पंच महाभूते • विश्व आणि त्याची निर्मिती (पुराणे आणि वेद) • परस्पर संबंध (ब्रह्म आणि आत्मा) • उर्जा (प्राण) • ध्वनी आणि स्पंदन (नाद) • प्रकाश (तेजस) • प्रकाशाचे प्रतिबिंब आणि अपवर्तन • कणाद यांचा अनुवाद : अणूंचे जग • गति आणि बलांचे सिद्धांत (न्याय सूत्र) • काळ एक बहुआयामी संकल्पना • शून्य आणि अनंताची संकल्पना • तरंग कण द्वैत (तंत्र आणि वेदांत) • उष्मा गतिकी (आयुर्वेदातील उष्णता आणि रुपांतर) • चुंबकत्व आणि वीज (अगस्त्य संहिता) • सूर्य सिद्धांत: खगोलशास्त्रातील एक अद्भुत प्रवास ! • भास्करा चार्याचे गुरुत्वाकर्षण सिद्धांत: न्यूटन पूर्वीच गुरुत्वाकर्षणाचा शोध! • आर्यभट्टाचे खगोलशास्त्रीय योगदान: एका महान ऋषींचे क्रांतिकारी विचार
9	पर्यावरण शास्त्र	• सध्याच्या पार्यावर्निक महासंकटाची कारणे

		• भारतीय तत्त्वज्ञान आणि जीवनविचार • निसर्ग विषयक भाव • निसर्ग हानी • भविष्यासाठी धडे
10	कृषिशास्त्र	• वेदोक्त भारतीय कृषी ज्ञान परंपरा • भारतीय प्राचीन वाङ्मय आणि कृषी • कृषी पराशर आणि काश्यपीयकृषीसुक्ती • सिंधू संस्कृतीमध्ये गहू, कापूस, ऊस लागवड • भारतीय कृषी – प्रारंभिक इतिहास • भारतीय कृषी – मध्य आणि आधुनिक युग • भारतीय कृषी – वसाहती ब्रिटिश युग • प्रजासत्ताक भारत (१९४७ नंतर)
11	वनस्पतीशास्त्र	• प्राचीन भारतातील वनस्पती विज्ञानाचा इतिहास • प्राचीन वनस्पती विज्ञानाचे स्वरूप • वृक्ष – वनस्पतींचे प्रकार व स्वरूप • वृक्षायुर्वेदातील महत्त्वाचे विभाग आणि त्यांचे सविस्तर वर्णन • महाभारतातील वनस्पतींना संवेदना असण्याबाबत विचार • प्राचीन भारतीय सांस्कृतिक दृष्टीकोन • वैज्ञानिक दृष्टीकोन आणि वृक्षायुर्वेद • प्राचीन काळातील वृक्षारोपण पध्दती

Reference Books

1. Mahadevan, B., Vinayak Rajat Bhat & Nagendra Pavana R.N.
   Introduction to Indian Knowledge System: Concepts and Applications, PHI Learning Pvt. Ltd., 2022.
2. Kapil Kapoor & Avadhesh Kumar Singh (Editors)
   Indian Knowledge Systems – Vol. I & II. D.K. Printworld, New Delhi.
3. B.G. Sidharth
   The Celestial Key to the Vedas, Inner Traditions Publications.
4. Subhash Kak & T.R.N. Rao**,** *Computing Science in Ancient India,* Munshiram Manoharlal Publishers.

Online Resources

- Indian Knowledge Systems (IKS) Division – Ministry of Education https://iks.aicte-india.org/
- IKS E-Books and Knowledge Repository https://iks.aicte-india.org/ebook.php
- UGC Guidelines for Incorporating IKS in Higher Education https://snggdcg.ndl.gov.in/items/083a1536-cb8f-4660-ab0b-8a329e521b6b?
- NPTEL Courses on Indian Knowledge Systems https://nptel.ac.in/

IKSK105: Indian Knowledge System – Generic ***(Offered in Online mode)***

Course details

Course Code	Course	Category	Course Type	Credits
XXXE101	Select from **other faculty OE courses list**	OE	Theory	2
XXXE102	Select from **other faculty OE courses list**	OE	Theory	2

Link: https://drive.google.com/drive/folders/1wQTdouKXZBzG7bHWhTR0dqd5NnwGFrmK

CCRX101 to CCRX106: [Practical: 2 Credits]

Semester I						
Course Code	**Course Name**	**Theory/ Practical /Project**	**Total Study (HRS)**	**Credit Points**	**Assessment Type**	**Passing Marks**
CCRX101	Health and Wellness-I	Practical	60	2	CA (20/50)	20/50
CCRX102	Yoga Education-I	Practical	60	2	CA (20/50)	20/50
CCRX103	Sports and Fitness-I	Practical	60	2	CA (20/50)	20/50
CCRX104	Cultural Activities-I	Practical	60	2	CA (20/50)	20/50
CCRX105	NSS-I	Practical	60	2	CA (20/50)	20/50
CCRX106	Fine/Applied/Visual/Performing Arts-I	Practical	60	2	CA (20/50)	20/50