

Yashoda Shikshan Prasarak Mandal's
YASHODA TECHNICAL CAMPUS, SATARA
(An Autonomous Institute)

Affiliated to Shivaji University, Kolhapur

Approved by AICTE, DTE Mumbai NBA Accredited | NAAC Accredited



FACULTY OF COMPUTER APPLICATION

Syllabus for
Bachelor of Computer Application (BCA)

BCA Part-I (SEM I & II)

(To be implemented from August 2026 onwards)

(As per NEP-2020)

Yashoda Technical Campus, Satara
Faculty of Computer Application
Bachelor of Computer Applications (BCA)

BCA (Part I) from Academic Year 2026-27

1. Introduction:

Bachelor of Computer Application: The Bachelor of Computer Application (BCA) is a 4-year undergraduate degree program designed to provide students with strong knowledge of computer applications, programming, software development, databases, networking, web technologies, and emerging technologies. The program equips students with the technical skills and practical knowledge required to build successful careers in the IT industry or pursue higher education.

The program consists of 8 semesters spread over 4 years and follows the under NEP 2020. It comprises 176 credits, and the approved intake capacity is 120 students, as per AICTE and affiliating university norms.

2. Duration of Program:

Undergraduate Programmes: The undergraduate programme shall normally extend over six semesters (three academic years) or eight semesters (four academic years), as applicable under the provisions of NEP 2020.

3. Objective:

The BCA program prepares students for rewarding careers in the IT industry by developing strong technical, programming, and problem-solving skills. After completing the program, students can pursue higher education such as MCA, MBA, M.Sc. (Computer Science/IT), or other postgraduate programs at recognized universities in India or abroad. The program also provides a strong foundation for careers in software development, web development, data analytics, cyber security, cloud computing, and entrepreneurship.

4. Re-entry (Multiple Entry and Exit)/Lateral Entry

Students who exit the programme at any eligible level may re-enter the programme at a later stage, subject to the AICTE guidelines, the availability of seats, and the rules of the Autonomous College. The re-entry shall be permitted as per the Multiple Entry and Exit provisions under NEP 2020.



Semester, NSQF Level and Exit Points

Sr. No.	Semester	Academic Year	Duration Completed	Credits Earned	NSQF Level	Exit Point & Award
1	Semester I & II	2026-27	1 Year	44	4.5	Certificate in Computer Application (One Year / Two Semesters)
2	Semester III & IV	2027-28	2 Years	88	5.0	Diploma in Computer Application (Two Years / Four Semesters)
3	Semester V & VI	2028-29	3 Years	136	5.5	Bachelor in Computer Application (Three Years / Six Semesters)
4	Semester VII & VIII	2029-30	4 Years	180	6.0	Bachelor of Computer Application (Honours) (Four Years / Eight Semesters)
5	Semester VII & VIII*	2029-30	4 Years	180	6.0	Bachelor of Computer Application (Honours with Research) (Four Years / Eight Semesters, subject to Research Track requirements)

5. Eligibility:

Candidates who have passed the Higher Secondary Certificate (10+2) examination in any stream (Science, Commerce, Arts, or Vocational) or a Government-approved Diploma in Engineering/Technology from a recognized Board are eligible for admission. Candidates who have completed their qualifying examination from a Foreign Board or University must obtain an Equivalence Certificate from the Association of Indian Universities (AIU) or the competent authority in India.

Candidates must appear for the **MAH-BCA CET** conducted by the **State CET Cell, Government of Maharashtra**. Admissions are carried out through the **Centralized Admission Process (CAP)** conducted by the State CET Cell. The admission process is governed by the rules and guidelines issued by the **Government of Maharashtra**, the **State CET Cell**, and the **Autonomous College** from time to time.



6. PEO, PO and CO Mappings:

Program Educational Outcomes: After successful completion of the program, graduates will be able to:

PEO I	Technical Expertise	Implement fundamental domain knowledge of core courses for developing effective computing solutions by incorporating creativity and logical reasoning.
PEO II	Successful Career	Deliver professional services with updated technologies in Computer application based career.
PEO III	Interdisciplinary and Life Long Learning	Develop leadership skills and Interdisciplinary incorporate ethics, team work with effective communication & time Long Learning management in the profession. Undergo higher studies, certifications and technology research as per market needs

Program Outcomes (PO's): - After completion of program Students / graduates will be able to:

PO1: Apply knowledge of computer science and information technology to solve real-world problems.

PO2: Design, develop, and implement software applications using appropriate programming languages and tools.

PO3: Design computing solutions that meet user requirements while considering technical and practical constraints.

PO4: Analyze problems and apply logical thinking to develop effective computing solutions.

PO5: Demonstrate professional ethics, social responsibility, and integrity in computing practices.

PO6: Communicate effectively and work collaboratively as an individual and as a team member.

PO7: Engage in lifelong learning, higher education, and interdisciplinary knowledge to adapt to changing technologies.

PO8: Understand emerging technologies, current trends, and contemporary issues in the field of computing.

PO9: Use modern computing tools, technologies, and techniques for software development and problem-solving.

Course Outcome(s):

Each course in the program is designed with clearly defined **Course Outcomes (COs)** that specify the knowledge, skills, and competencies students are expected to achieve upon successful completion of the course. The Course Outcomes are aligned with the **Program Outcomes (POs)** and **Program Educational Outcomes (PEOs)** to ensure the attainment of the program objectives. The mapping of **PEOs, POs, and COs** is presented below.



Program Educational Objectives (PEOs)	Thrust Area	Associated Program Outcomes (POs)	Courses Contributing to COs (Course Codes)
PEO I: Implement fundamental domain knowledge of core courses for developing effective computing solutions by incorporating creativity and logical reasoning.	Technical Expertise	PO1, PO2, PO3, PO9	0UBCPC101, 0UBCPC102, 0UBCOE103, 0UBCPC108, 0UBCPC201, 0UBCPC202, 0UBCPC203, 0UBCPC301, 0UBCPC302, 0UBCPC303, 0UBCPC401, 0UBCPC501, 0UBCPC502, 0UBCPC503, 0UBCPC601
PEO II: Deliver professional services with updated technologies in Computer application based career.	Successful Career	PO4, PO5, PO6	0UBCMD104, 0UBCVS105, 0UBCVE106, 0UBCHM206, 0UBCVS205, 0UBCVS209, 0UBCVS305, 0UBCVS405, 0UBCVS505, 0UBCVS605
PEO III: Develop leadership skills and Interdisciplinary incorporate ethics, team work with effective communication & time Long Learning management in the profession. Undergo higher studies, certifications and technology research as per market needs	Interdisciplinary and Life Long Learning	PO7, PO8	0UBCAE107, 0UBCPC503, 0UBCPC601, Project Courses, Internship, Seminar, Program Electives, Honours Courses (Semester VII & VIII)

Program Specific Outcome (PSO):

PSO1: Software Development and Emerging Technologies

Ability to design, develop, and deploy software applications using programming, databases, web technologies, and software engineering principles, while applying Artificial Intelligence, Data Science, and Full Stack Development to solve real-world problems.

PSO2: Professional Excellence, Innovation, and Lifelong Learning

Students will demonstrate professional ethics, effective communication, teamwork, leadership, entrepreneurship, and project management skills while pursuing higher education, research, industry certifications, and lifelong learning. They will continuously adapt to evolving technologies and contribute effectively to the computing profession and society through innovation and responsible use of technology.

7. Workload (Period/Lectures for each Course):

The workload for each course shall be as prescribed in the curriculum structure approved by the Academic Council. Generally, a 4-credit theory course shall comprise 60 contact hours, while a 2-credit theory course shall comprise 30 contact hours during a semester, with each lecture having a duration of 60 minutes. Laboratory courses, project work, internships, and other academic activities shall be conducted as per the credit structure and academic regulations of the Institution.



8. Standard of Passing: Rules under the National Education Policy and the rules extended by Institute regarding ATKT will be applicable.

- Sem. I → II: A student will proceed to Semester II irrespective of result in Semester I.
- Sem. II → III: A student will earn at least **50% of total credits of Level 4.5 (Sem. I & II)**.
- Sem. III → IV: A student will proceed to Semester IV irrespective of result in Semester III.
- Sem. IV → V: A student will pass all courses of Level 4.5 and earn at least **50% of total credits of Level 5.0 (Sem. III & IV)**.
- Sem. V → VI: A student will proceed to Semester VI irrespective of result in Semester V.
- Sem. VI → VII: For the Four-Year Bachelor's Degree, a student will complete the Three-Year Bachelor's Degree with a minimum **7.5 CGPA**.
- Sem. VII → VIII: A student will proceed to Semester VIII irrespective of result in Semester VII.

9. Gradation Chart:

Marks Obtained (%)	Numerical Grade (Grade Point)	CGPA	Letter Grade	Class Awarded
Absent	0	—	Absent	—
Below 40	0–4	0.00–3.99	F (Fail)	Fail
40–50	5	4.00–4.99	C	Pass Class
51–60	6	5.00–5.99	B	Higher Second Class
61–70	7	6.00–6.99	B+	First Class
71–80	8	7.00–7.99	A	Distinction
81–90	9	8.00–8.99	A+	Higher Distinction
91–100	10	9.00–10.00	O (Outstanding)	Higher Distinction (Extraordinary)

Note: i) Marks obtained ≥ 0.5 shall be rounded off to next higher digit. ii) The SGPA & CGPA shall be rounded off to 2 decimal points.

Calculation of SGPA & CGPA

- Semester Grade Point Average (SGPA)-** The Semester Grade Point Average (SGPA) represents a student's academic performance in a particular semester.

$$\text{SGPA} = (\Sigma \text{ Course Credits} \times \text{Grade Points}) / \text{Total Credits of the Semester}$$

- Cumulative Grade Point Average (CGPA)-** The Cumulative Grade Point Average (CGPA) represents the overall academic performance of a student across all completed semesters.

$$\text{CGPA} = (\Sigma \text{ Semester Credit Points}) / \text{Total Credits of All Completed Semesters}$$



10. Nature of question paper

a) Nature of question paper is as follows for 60 Marks End Semester Examination (4 Credit)

QUESTION PAPER PATTERN 60 MARKS

Duration: 2.5 Hours

Total Marks – 60

Instructions:

- 1) Que.1 and Que. 7 are compulsory.
- 2) Attempt any THREE questions from Que. No.2 to Que. No. 6.
- 3) Figures to the right indicate marks.

Q. 1)	Short Answer questions (5 questions for 2 mark each)	10 MARKS
Q. 2)	Broad question/case study/Exercise Example/Quantitative problems	10 MARKS
Q. 3)	Broad question/case study/Exercise Example/Quantitative problems	10 MARKS
Q. 4)	Broad question/case study/Exercise Example/Quantitative problems	10 MARKS
Q. 5)	Broad question/case study/Exercise Example/Quantitative problems	10 MARKS
Q. 6)	Broad question/case study/Exercise Example/Quantitative problems	10 MARKS
Q. 7)	Write notes on (Any Four out of five)	20 MARKS

b) Nature of question paper is as follows for 30 Marks University end semester Examination (ESE) (2 Credit)

Duration: 2.5 Hour

Total Marks – 60

Instructions:

1. All questions are compulsory
2. Figures to the right indicate marks.

Q. 1)	Short Answer questions (5 questions for 2 mark each)	10 MARKS
Q. 2)	Broad question/case study/Exercise Example/Quantitative problems	10 MARKS
Q. 3)	Broad question/case study/Exercise Example/Quantitative problems	10 MARKS
Q. 4)	Broad question/case study/Exercise Example/Quantitative problems	10 MARKS
Q. 5)	Broad question/case study/Exercise Example/Quantitative problems	10 MARKS
Q. 6)	Broad question/case study/Exercise Example/Quantitative problems	10 MARKS
Q. 7)	Write notes on (Any Four out of five)	20 MARKS



C) Nature of question paper is as follows for 50 Marks Mid semester Examination (MSE) (4 Credit)

Duration: 2 Hours

Total Marks – 50

Instructions:

1. Que.1 and Que. 6 are compulsory.
2. Attempt any THREE questions from Que. No.2 to Que. No. 5.
3. Figures to the right indicate marks.

Q.1)	Broad answer question	10 MARKS
Q.2)	Broad answer question	10 MARKS
Q.3)	Broad answer question	10 MARKS
Q.4)	Broad answer question	10 MARKS
Q.5)	Broad answer question	10 MARKS
Q.6)	Write notes on (Any TWO out of FOUR)	10 MARKS

a) Nature of question paper is as follows for 30 Marks Institute Mid Semester Examination (MSE) (2 Credit)

Duration: 1.5 Hour

Total Marks – 30

Instructions:

1. All questions are compulsory
2. Figures to the right indicate marks.

Q.1)	Broad question/case study/Exercise Example/Quantitative problems	10 MARKS
OR		
Q.1)	Broad question/case study/Exercise Example/Quantitative problems	10 MARKS
Q.2)	Write Short answer question/Exercise/Problem (Any TWO) i) ii) iii) iv)	10 MARKS
Q.4)	Write short notes (Any TWO) i) ii) iii) iv)	10 MARKS

11. Nature of Practical Question Paper:

a) Practical Examination for 30 Marks (University End-Semester Examination)

- The practical examination shall be of **30 marks**.
- The question paper will consist of **two practical questions**, each carrying **10 marks**. Students are required to **attempt any two questions from three**.

Viva-Voce (Oral): 10 marks.

a) **Internal= Attendance +Journal = 10+10 = 20 marks.**

b) **Duration of Examination: 2 Hours.**



Conduct of Practical Examination- The practical examinations shall be conducted by a panel of examiners appointed by the College. The examiner panel shall comprise experienced faculty members with a minimum of five years of full-time teaching experience in the relevant discipline

12. Medium of Instruction: The medium of instructions shall be in English.

13. Teachers Qualification: As per AICTE Norms.

14. Internal Marks Distribution –

The Internal Assessment shall be carried out through continuous evaluation as per **NEP 2020, Outcome-Based Education (OBE)**, and **Bloom's Taxonomy**. The assessment shall include written examinations, assignments, attendance, and learner-centric pedagogical activities.

Internal Assessment Marks Distribution for 40 Marks

Component	Marks
Assignment	05
Attendance	05
Mid Semester Examination (MSE)	20
Offline and Online Activity (as per NEP 2020 Pedagogy and Bloom's Taxonomy)	10
Total	40

Internal Assessment Marks Distribution for 20 Marks

Component	Marks
Assignment	02
Attendance	03
Mid Semester Examination (MSE)	10
Offline and Online Activity (as per NEP 2020 Pedagogy and Bloom's Taxonomy)	05
Total	20

Note:

- The faculty member may select suitable **offline or online activities** based on the nature of the course.
- Activities should promote higher-order learning skills such as Apply, Analyze, Evaluate, and Create As defined in Bloom's Taxonomy.
- The department shall maintain records of assignments, attendance, internal examinations, and Activity evaluations for verification by the University/Autonomous College authorities, whenever required.



Sr. No.	Pedagogy	Suggested Activities
1	Classroom Teaching	Lecture, Question–Answer Session
2	Assignment-Based Learning	Home Assignment, Worksheet
3	Activity-Based Learning	Quiz, Puzzle, Class Activity
4	Group Learning	Group Discussion, Group Task
5	Presentation	Individual or Group Presentation
6	Problem Solving	Solve Programming or Numerical Problems
7	Case Study	Discuss Real-Life Examples
8	Demonstration	Live Software or Coding Demo
9	Hands-on Learning	Practice Using Software/Tools
10	Project-Based Learning	Mini Project, Model Development
11	Self-Learning	Read Notes, Watch Videos, Online Learning
12	Peer Learning	Learn with Classmates, Peer Teaching
13	Brainstorming	Share Ideas and Find Solutions
14	Flipped Learning	Study Before Class and Discuss in Class
15	Seminar	Present a Technical Topic
16	Online Learning	Google Classroom, NPTEL, SWAYAM, MOOCs
17	Library Learning	Book Reading, Article Review
18	Industry Interaction	Expert Talk, Webinar, Guest Lecture
19	Coding Practice	Programming Exercises, Coding Challenge
20	Continuous Assessment	Quiz, Assignment, Attendance, Class Participation

15. Mini Project—(Semester IV and VI)

The project may be undertaken **in a group of not more than three students** under the supervision of a faculty mentor. Students shall identify a real-world problem and develop an innovative software solution using the knowledge and skills acquired throughout the BCA programme. The project should preferably be based on emerging technologies or any other contemporary computing domain approved by the Department.



The project shall be carried out under the supervision of a faculty mentor and shall be evaluated through continuous internal assessment and an End Semester Practical Examination. Students shall submit the project report in the prescribed format and successfully complete the presentation and viva-voce examination.

Project Assessment Scheme (50 Marks)

Assessment Component	Marks
Internal Assessment (IA)	20
End Semester Practical Examination (ESE)	30
Total	50

Internal Assessment Rubric (20 Marks)

Component	Marks
Attendance, Problem Definition, Feasibility Study	02
System Design & Progress Review	06
Software Development & Implementation Progress	08
Documentation, Presentation & Internal Viva	04
Total	20

End Semester Practical Examination Rubric (30 Marks)

Component	Marks
Software Implementation & Functionality	10
Innovation, Technical Complexity & Testing	3
Project Report	5
Project Demonstration & Presentation	7
Viva-Voce	5
Total	30

- Successful completion of the project, submission of the dissertation, project demonstration, and viva-voce examination are mandatory for the award of credits.

16. Major Project/ Internship – (Semester V)

The **Major Project** shall be undertaken **individually** based on the learning and experience gained during the mandatory Summer Internship of **60 days** must completed after the **Semester IV End Semester Examination**. Students shall identify an industry-oriented or research problem, perform requirement analysis, prepare the system design, develop the proposed solution, and submit the project report in the prescribed format. The project



shall be carried out under the guidance of an internal faculty mentor and, wherever applicable, an industry mentor.

The project shall be evaluated independently of the internship. Students must successfully complete both the Project and Internship separately to earn the respective credits.

Project Assessment Scheme (100 Marks)

Assessment Component	Marks
Internal Assessment (IA) + Internship	10+30 (40)
End Semester Practical Examination (ESE)	60
Total	100

Internal Assessment Rubric (40 Marks)

Component	Marks
Attendance, Joining letter, Completion letter	5
Industry Weekly Report	5
Student Guide Meet Record	5
Major Project Synopsis	15
Presentation	10
Total	40

End Semester Practical Examination Rubric (60 Marks)

Component	Marks
Problem Identification & Objectives	3
Feasibility Study & Requirement Analysis	2
System Design (Architecture/UML/Database/UI)	5
Software Development & Implementation	20
Testing & Validation	5
Documentation (Project Report)	10
Viva-Voce	15
Total	60

- Successful completion of the project, submission of the dissertation, project demonstration, and viva-voce examination are mandatory for the award of credits.



17. Summer Internship – I (Semester V) (50 Marks)

The Summer Internship shall be completed **after the Semester IV End Semester Examination** in a recognized industry, organization, startup, research laboratory, or government organization.

The internship shall be of the 60 days duration prescribed by the Institution. Students shall submit an internship completion certificate, internship report, and presentation.

Internship – I Evaluation Rubric (50 Marks)

Component	Marks
Attendance, Discipline & Professional Conduct	5
Industry Mentor Evaluation	15
Internship Diary / Log Book	5
Internship Report	10
Presentation & Demonstration	10
Viva-Voce	5
Total	50

18. Fee Structure: As per Govt. of Mahaashtra norms.

19. Requirements:

- Core Faculty: As per AICTE Norms
- Computer Lab and Internet: As per AICTE Norms*
- Library (Books and Journals): As per AICTE Norms*
- Class Room and Physical Infrastructure: As per AICTE Norms*
- Nonteaching: One clerk, two peons and two lab assistants for one division and will be increased proportion to number of divisions.

***Refer AICTE Process Manual 2024-2027**

22. Pattern of B.C.A. Programme

Combination of internal assessment and Semester- End Examination for B.C.A will be 60:40 pattern which shall be applicable for each course of 4, 2 credits. Here, each course in each semester wherein 60% marks shall be for End Semester-End-Examination and 40 % marks for internal assessment.

Credits	External	Internal	Total	Passing Standard
For 4 Credit	60	40	100	Total Passing 40 % out of 100 or 50 (40% Theory and 40 % Internal
For 2 Credit	30	20	50	



For 2 Credit Practical's	30	20	50	Examination Separately)
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SEMESTER-WISE CREDIT DISTRIBUTION

3 Years BCA Program	Total Credits = 136
4 Years BCA (Honours)	Total Credits = 180
4 Years BCA (Honours with Research)	Total Credits = 180

Note: Students can take extra credit course from their own department or from other department as per the University norms



CREDIT DISTRIBUTION : SEMESTER WISE-BCA

1 Lecture hour = 1 Credit 2 Lab Hours = 1 Credit 1 Tutorial Hour = 1 Credit

Sr.No	Type of Course	No of Credits /Semester													BCA- (Honors with Research)	
		BCA (1 to 6 Semester)								BCA-IV SEMESTER VII (Honors with Research)	BCA-IV SEMESTER VIII (Honors with Research)	BCA	BCA- (Honors)			
		1	2	3	4	5	6	BCA-IV SEMESTER VII (Honors)	BCA-IV SEMESTER R VIII (Honors)							
1	Programme Core Course(PC)	10	14	12	12	0	4	8	0	6	7	8	0	52	60	58
2	Programme Elective Course (PE)	0	0	6	6	18	12	12	18	12	0	0	0	42	72	54
3	Multidisciplinary Minor (MD)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4	Open Elective (OE)	4	2	2	0	0	0	0	0	0	0	0	0	8	8	8
5	Vocational and Skill Enhancement Course (VS)	2	4	0	0	2	0	0	0	0	0	0	0	8	8	8
6	Ability Enhancement Course (AE)	2	0	0	0	0	2	0	0	0	0	0	0	4	4	4
7	Humanities & Management Courses (HM))	0	2	0	2	0	2	0	0	0	0	0	0	6	6	6
8	Indian Knowledge System(IK)	2									0	0	0	2	2	2
9	Value Education Course (VE)	2	0	2	0	0	0	0	0	0	0	0	0	4	4	4
10	Project/Mini Project (PR)	0	0	0	2	4	2	0	4	0	0	22	0	8	12	30
11	Internship (IR)	0	0	0	0	0	0	2	0	2	2	0	0	0	2	2
12	Co-curricular Courses (CC)	0	0	2	0	0	0	0	0	0	0	0	0	2	2	2
13	Research Methodology	0	0	0	0	0	0	0	0	0	2	0	0	0	0	2
Total		22	22	24	22	24	22	22	22	22	22	22	22	136	180	180

Programme Total (3 Years BCA)

Year / Semester	Total Credits	Total Marks	Theory ESE	Theory CIE	Practical Marks	Total Hours (TH + PR)
BCA-I Semester I	22	550	300	200	50	18 TH + 02 Tut + 04 PR
BCA-I Semester II	22	550	240	160	150	16 TH + 12 PR
BCA-II Semester III	24	600	210	140	250	17 TH + 13 PR
BCA-II Semester IV	22	550	210	140	200	14 TH + 16 PR
BCA-III Semester V	24	550	240	160	250	13 TH + 01 Tut + 20 PR
BCA-III Semester VI	22	550	210	140	200	14 TH + 16 PR
Programme Total (3 Years BCA)	136	3350	1410	940	1100	89 TH + 03 Tut + 82 PR

BCA-III Semester VII (Honours)	22	550	210	140	200	14 TH + 16 PR
BCA-III Semester VIII (Honours)	22	550	180	120	250	12 TH + 20 PR
Programme Total (4 Years BCA Honours)	180	4550	1800	1200	1550	115 TH + 03 Tut + 134 PR

BCA-III Semester VII (Honours)	22	550	210	140	200	14 TH + 16 PR
BCA-III Semester VIII (Honours)	22	550	400	150		
Programme Total (4 Years BCA Honours with Research)	180	4550	2020	1230	1300	103 TH + 03 Tut + 98 PR



INDUCTION PROGRAM

The objectives, structure, and implementation of the Student Induction Program (SIP) shall be in accordance with the guidelines prescribed by the All India Council for Technical Education (AICTE). Detailed information is available in the *AICTE Student Induction Program Manual* on the AICTE portal. The program shall be conducted as per the latest AICTE Model Curriculum and subsequent guidelines issued from time to time. (Link: <https://www.aicteindia.org/>) For more, Refer AICTE Model syllabus.

Induction Program (Mandatory)	Three-week Duration
Induction program for students to be offered right at the start of the first year.	• Physical Activity • Creative Arts • Universal Human Values • Literary Activities • Proficiency Modules • Lectures by Eminent Personalities • Visits to Local Areas • Familiarization with the Department/Branch, Laboratories, Library, Innovation & Entrepreneurship Activities

Mandatory Visits / Workshops / Expert Lectures

1. It is mandatory to organize at least one industrial visit during each academic year for the students of every programme to provide practical exposure to industry practices.
2. The institution shall conduct skill development workshops, hands-on training programmes, or entrepreneurship/industry-oriented workshops during the programme to enhance students' professional competencies.
3. Each department shall organize at least one expert lecture, seminar, or technical talk every semester by inviting eminent academicians, industry professionals, entrepreneurs, or researchers from relevant domains.

Summer Internship / Project Work / Seminar

Students shall successfully complete the prescribed Summer Internship, Project Work, Seminar, or Field-Based Learning as specified in the curriculum.

Evaluation shall be based on:

- Quality of work carried out
- Technical knowledge and practical skills
- Project/Internship Report
- Presentation and Communication Skills
- Viva-Voce Examination
- Innovation, Creativity, and Problem-Solving Approach
- Professional Conduct and Regularity



Course Structure-BCA- I

BCA-I SEMESTER I														
Course Code	Course Domain	Course Name	Teaching Scheme					Evaluation Scheme					TOTAL	
			L	T	P	SL	Credit	Scheme	Theory		Practical			
									Max.	Min. Passin g	Max.	Min. Passin g		
0UBCPC101	F,E,R	C-Programming Language	4	0	0	4	4	ISE	20	40*	0	0	100	
								MSE	20					
								ESE	60					
0UBCPC102	F	Computer Architecture	4	0	0	4	4	ISE	20	40*	0	0	100	
								MSE	20					
								ESE	60					
0UBCOE103	F,E,R	Mathematics Foundations to Computer Science - I	4	0	0	4	4	ISE	20	40*	0	0	100	
								MSE	20					
								ESE	60					
0UBCIK104	F,R	Indian Vision	2	0	0	2	2	ISE	10	40*	0	0	50	
								MSE	10					
								ESE	30					
0UBCVS 105	F	General English	1	1	0	2	2	ISE	10	40*	0	0	50	
								MSE	10					
								ESE	30					
0UBCVE106	F,R	Environmental Science and sustainability	2	0	0	2	2	ISE	10	40*	0	0	50	
								MSE	10					
								ESE	30					
0UBCAE107	F	German/Marathi/Hindi-Paper	1	1	0	2	2	ISE	10	40*	0	0	50	
								MSE	10					
								ESE	30					
0UBCPC108	F,E	C-programming Lab	0	0	4	1	2	ISE			20	25**	50	
								ESE			30			
TOTAL			18	2	4	21	22	0	500		50		550	
Total Contact Hours Per Week			24											

Course Category	Programme Core Course	Programme Elective Course	Open Elective Course	Indian Knowledge System	Vocational and Skill Enhancement Course	Value Education	Ability Enhancement Course	Humanities and Management Course	Internship	Project	Co-curricular Courses	Total
Sem I	PC	PE	OE	IK	VE	VS	AE	HM	IR	PR	CC	22
Credit	10	-	4	2	2	2	2	0	0	0	0	

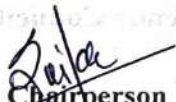
ISE: In-semester Evaluation, MSE: Mid Semester Examination, ESE: End Semester Examination

Note 1:

* ISE + MSE = 40%, ESE = 40%, and the combined together needs to be 40% for passing Theory Course.

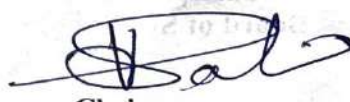
** ISE = 40%, ESE = 50%, and the combined together need to be 50% for passing Lab Courses.

Note: The Bridge Course shall be offered after the completion of Semester I to facilitate students' transition and strengthen the foundational knowledge required for subsequent semesters.


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BCA-I SEMESTER II

Course Code	Course Domain	Course Name	Teaching Scheme					Evaluation Scheme					TOTAL
			L	T	P	SL	Credit	Scheme	Theory		Practical		
									Max.	Min. Passing	Max.	Min. Passing	
0UBCPC201	F,E,R	Data Structure	4	0	0	4	4	ISE	20	40*	0	0	100
								MSE	20				
								ESE	60				
0UBCPC202	F	Operating Systems	2	0	0	2	2	ISE	10	40*	0	0	50
								MSE	10				
								ESE	30				
0UBCPC203	F,E	Object Oriented Programming using JAVA	4	0	0	4	4	ISE	20	40*	0	0	100
								MSE	20				
								ESE	60				
0UBCOE204	F	Mathematics Foundations to Computer Science – II	2	0	0	2	2	ISE	10	40*	0	0	50
								MSE	10				
								ESE	30				
0UBCVS205	F,E,R	Web Technologies	2	0	0	2	2	ISE	10	40*	0	0	50
								MSE	10				
								ESE	30				
0UBCHM206	F	Indian Constitution	2	0	0	2	2	ISE	10	40*	0	0	50
								MSE	10				
								ESE	30				
0UBCPC207	F,E,R	Data Structure Lab	0	0	4	1	2	ISE			20	25**	50
								ESE			30		
0UBCPC208	F,E,R	Core JAVA Lab	0	0	4	1	2	ISE			20	25**	50
								ESE			30		
0UBCVS209	F,E,R	Web Technologies Lab	0	0	4	1	2	ISE			20	25**	50
								ESE			30		
TOTAL			16	0	12	19	18		400		50		550
Total Contact Hours Per Week			28										

Course Category	Programme Core Course	Programme Elective Course	Open Elective Course	Multi Disciplinary Minor Course	Value Education	Vocational and Skill Enhancement Course	Ability Enhancement Course	Humanities and Management Course	Internship	Project	Co-curricular Courses	Total
SemII	PC	PE	OE	MD	VE	VS	AE	IIM	IR	PR	CC	22
Credit	14	0	2	0	0	4	0	2	0	0	0	

ISE: In-semester Evaluation, MSE: Mid Semester Examination, ESE: End Semester Examination
Note 1:
 * ISE + MSE = 40%, ESE = 40%, and the combined together needs to be 40% for passing Theory Course.
 ** ISE = 40%, ESE = 50%, and the combined together need to be 50% for passing Lab Courses.

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Exit Option after First Year of the BCA Programme

In accordance with the provisions of **NEP 2020** and the guidelines of **Institute**, students shall have the option to exit the Bachelor of Computer Application (BCA) programme after the successful completion of the First Year (Semester I & II). Students opting for the exit option shall be awarded Certificate in Computer Application, provided they have successfully earned the prescribed academic credits and completed an additional 4-credit requirement in any one of the following categories:

Additional 4-Credit Requirement

Students must complete **any one** of the following:

1. Skill Enhancement Course

- a. A skill-based course aimed at enhancing practical and technical competencies in the field of Computer Applications.
- b. The following options may be considered:
 - i. Tally
 - ii. NPTEL Certificate Course (approved by the Institute)

OR

2. Internship / Apprenticeship

- o A professional internship or apprenticeship in a relevant organization for a minimum duration of 08 weeks after Semester II, as per the Institute On-the-Job Training (OJT) Policy.

OR

3. Social Responsibility and Community Engagement

- 1) Participation in community service through an NGO or recognized community organization for a minimum duration of **08 Weeks** during the summer vacation after Semester II.
- 2) The activity should promote social responsibility, community engagement, and real-world problem-solving.

The mode, evaluation, and other implementation guidelines for the additional 4-credit requirement shall be as prescribed by Institute. Students opting for the exit shall successfully complete the selected activity and submit the required certificate, report, or other prescribed documents as per the University schedule.

Re-entry to the BCA Programme

A student who exits after the successful completion of the first year with the award of a UG Certificate in Computer Application may be permitted to re-enter the programme at the Third Semester (Second Year) in accordance with the Institute NEP Regulations, subject to fulfilling the prescribed eligibility criteria and earning the requisite credits.

Choice of Specialization

From the Second Year (Third Semester) onwards, students shall choose their Program Elective (PE) stream/specialization from the options provided in Appendix-A of the curriculum.

Note: Students intending to exit after the first year are advised to complete the Social Responsibility and Community Engagement component through an approved NGO or community organization during the summer vacation, wherever applicable, to fulfill the additional credit requirement.

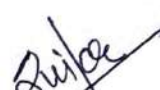
BCA-II SEMESTER III

Course Code	Course Domain	Course Name	Teaching Scheme					Evaluation Scheme					TOTAL
			L	T	P	SL	Credit	Scheme	Theory		Practical		
									Max	Min. Passing	Max	Min. Passing	
0UBCPC301	F,E,R	Database Management System	2	0	0	1	2	ISE	10	40*		0	50
								MSE	10				
								ESE	30				
0UBCPC302	F,E	Software Engineering	2	0	0	1	2	ISE	10	40*		0	50
								MSE	10				
								ESE	30				
0UBCPC303	F,E,R	Python Programming	4	0	0	4	4	ISE	10	40*		0	100
								MSE	20				
								ESE	10				
0UBCOE304	F,R	Probability and Statistics	2	0	0	1	2	ISE	10	40*		0	50
								MSE	10				
								ESE	30				
0UBCPE305	F,E,R	305.1_Professional Elective I (Data Science)	4	0	0	4	4	ISE	10	40*		0	100
		305.2_Professional Elective I (Artificial Intelligence & Machine Learning)						MSE	20				
		305.3_Professional Elective I (Full Stack Development)						ESE	10				
0UBCCC306	F	Yoga	1	0	1	2	2	ISE	10	40*		0	50
		Sports						MSE	10				
		NSS						ESE	30				
0UBCPC307	F,E,R	Database Management System Lab	0	0	4	1	2	ISE			20	25**	50
								ESE			30		
0UBCPC308	F,E,R	Python Programming Lab	0	0	4	1	2	ISE			20	25**	50
								ESE			30		
0UBCPE309	F,E,R	Professional Elective-I Lab	0	0	4	1	2	ISE			20	25**	50
								ESE			30		
0UBCVE310	F	MOOC	0	0	4	1	2	ISE			50	25**	50
								ESE					
TOTAL			15	0	17	17	24		280		200		600
Total Contact Hours Per Week			32										

Course Category	Programme Core Course	Programme Elective Course	Open Elective Course	Multi Disciplinary Minor Course	Value Education	Vocational and Skill Enhancement Course	Ability Enhancement Course	Humanities and Management Course	Internship	Project	Co-curricular Courses	Total
SemIII	PC	PE	OE	MD	VE	VS	AE	HM	IR	PR	CC	24
Credit	12	6	2	0	2	0	0	0	0	0	2	

ISE: In-semester Evaluation , MSE: Mid Semester Examination , ESE: End Semester Examination

Note 1:
* ISE + MSE = 40%, ESE = 40%, and the combined together needs to be 40% for passing Theory Course.
** ISE = 40%, ESE = 50%, and the combined together need to be 50% for passing Lab Courses.


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BCA-II SEMESTER IV														
Course Code	Course Domain	Course Name	Teaching Scheme					Evaluation Scheme					TOTAL	
			L	T	P	SL	Credit	Scheme	Theory		Practical			
									Max.	Min. Passing	Max.	Min. Passing		
0UBCPC401	F,E,R	Relational Database Management System (RDBMS)	2	0	0	2	2	ISE	10	40*		0	50	
								MSE	10					
								ESE	30					
0UBCPC402	F,E,R	Computer Networks	2	0	0	2	2	ISE	10	40*		0	50	
								MSE	10					
								ESE	30					
0UBCPC403	F,E,R	Artificial Intelligence	4	0	0	4	4	ISE	10	40*		0	100	
								MSE	20					
								ESE	10					
0UBCPE404	F,E,R	404.1 Professional Elective II- (Data Science)	4	0	0	4	4	ISE	10	40*		0	100	
		404.2 Professional Elective II (Artificial Intelligence & Machine						MSE	20					
		404.3 Professional Elective II (Full Stack Development)						ESE	10					
0UBCHM405	F,R	Design Thinking and Innovation	2	0	0	2	2	ISE	10	40*		0	50	
								MSE	10					
								ESE	30					
0UBCPC406	F,E,R	Relational Database Management System (RDBMS) Lab	0	0	4	1	2	ISE			20	25**	50	
								ESE			30			
0UBCPC407	F,E,R	Artificial Intelligence Lab	0	0	4	1	2	ISE			20	25**	50	
								ESE			30			
0UBCPE408	F,E,R	Professional Elective-II Lab	0	0	4	1	2	ISE			20	25**	50	
								MSE			30			
0UBCPR409	F,E,R	Mini Project	0	0	4	1	2	ISE			20	25**	50	
								ESE			30			
TOTAL			14	0	16	18	22		230		200		550	
Total Contact Hours Per Week			30											
Course Category	Programme Core Course	Programme Elective Course	Open Elective Course	Multi Disciplinary Minor Course	Value Education	Vocational and Skill Enhancement Course	Ability Enhancement Course	Humanities and Management Course	Internship	Project	Co-curricular Courses	Total		
SemIV	PC	PE	OE	MD	VE	VS	AE	HM	IR	PR	CC	22		
Credit	12	6	0	0	0	0	0	2	0	2	0			
ISE: In-semester Evaluation , MSE: Mid Semester Examination , ESE: End Semester Examination														
Note 1:														
* ISE+ MSE= 40%, ESE= 40% and the combined together needs to be 40% for passing Theory Course .														
** ISE= 40%, ESE= 50%, and the combined together need to be 50% for passing Lab Courses.														
Internship : Students are expected to complete 60 Days of internship after the Fourth semester(Summer), and its evaluation will be conducted in the Fifth semester.														


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Note:

1. At the end of the Fourth Semester every student shall undergo Summer Training / Internship / Capstone for Eight Weeks in the industry/Research or Academic Institute. This component will be evaluated during the fifth semester.
2. A Diploma in Computer Application will be awarded, if a student wishes to exit at the end of Second year.

Exit Criteria after Second Year of BCA Programme

Students will have the option to exit the Bachelor of Computer Application (BCA) program after successfully completing the second year. Upon exit, they will be awarded a **Diploma in Computer Application**. To be eligible for this diploma, students must complete an additional 04 credits in one of the following areas:

1.**Skill-Based Subject:** A specialized course aimed at enhancing technical and practical expertise in computer applications.

2.**Work-Based Vocational Course:** A vocational course offered during the summer term, focused on building practical, industry-relevant skills.

3.**Internship/Apprenticeship:** A professional internship or apprenticeship with a minimum duration of 08 weeks, conducted after the fourth semester, offering hands-on experience in a relevant field.

4.**Social Responsibility & Community Engagement:** Involvement with an NGO or community-based organization for a minimum of 08 weeks, contributing to social initiatives and applying computer application knowledge to solve real-world challenges.

5.**Capstone Project:** Completion of a capstone project integrating the skills and knowledge gained during the first two years of the program, which can be an independent or group project.

The specific mode of completing the additional credits will be decided by the **Institute** and students will be required to complete the 08-week program or project during the summer term following their fourth semester.

Students opting for this exit will also be required to **submit an Internship/Apprenticeship Report** or complete the Capstone Project as per the schedule outlined by the Institute before they are awarded the UG Diploma.

Re-entry Criteria in to Third Year (Fifth Semester)

The student who takes an exit after second year with an award of Diploma may be allowed to re-enter into fifth Semester for completion of the BCA Program as per the Institute schedule after earning requisite credits in the Second year.

BCA-III SEMESTER V

Course Code	Course Domain	Course Name	Teaching Scheme					Evaluation Scheme					TOTAL
			L	T	P	SL	Credit	Scheme	Theory		Practical		
									Max.	Min. Passing	Max.	Min. Passing	
0UBCPES01	F,E,R	501.1 Professional Elective III (Data Science)	4	0	0	4	4	ISE	10	40*	0	0	100
		MSE						20					
		ESE						10					
0UBCPES02	F	502.1 Professional Elective IV (Data Science)	4	0	0	4	4	ISE	10	40*	0	0	100
		MSE						20					
		ESE						10					
0UBCPES03	F,E	503.1 Professional Elective V (Data Science)	4	0	0	4	4	ISE	10	40*	0	0	100
		MSE						20					
		ESE						10					
0UBCVS504	F	Quantitative Techniques	1	1	0	2	2	ISE	20	40 *			50
								ESE	30				
0UBCPES05	F,E	Professional Elective-III Lab	0	0	4	1	2	ISE			20	25**	50
								ESE			30		
0UBCPES06	F,E	Professional Elective-IV Lab	0	0	4	1	2	ISE			20	25**	50
								ESE			30		
0UBCPES07	F,E	Professional Elective-V Lab	0	0	4	1	2	ISE			20	25**	50
								ESE			30		
0UBCPR508	F,E,R	Internship / Major Project	0	0	8	4	4	ISE			20	25**	50
								ESE			30		
TOTAL			13	1	20	21	24		120		250		550
Total Contact Hours Per Week			34										

Course Category	Program Core Course	Programme Elective Course	Open Elective Course	Multi Disciplinary Minor Course	Value Education		Vocational and Skill Enhancement Course	Ability Enhancement Course	Humanities and Management Course	Internship	Project	Co-curricular Courses	Total
Sem V	PC	PE	OE	MD	VE		VS	AE	HM	IR	PR	CC	
Credit	0	18	0	0	0		2	0	0	0	4	0	24

ISE : In-semester Evaluation , MSE: Mid Semester Examination , ESE: End Semester Examination

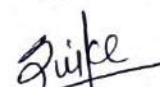
Note 1:

* ISE + MSE = 40%, ESE = 40% and the combined together needs to be 40% for passing Theory Course ** ISE = 40% ESE = 50%, and the combined together need to be 50% for passing Lab Courses. Internship: Students are expected to complete 60 Days of Internship after the Fourth semester(Summer), and its evaluation will be conducted in the Fifth semester.

ISE : In-semester Evaluation , MSE: Mid Semester Examination , ESE: End Semester Examination

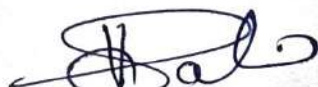
Note 1:

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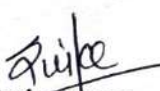

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BCA-III SEMESTER VI													
Course Code	Course Domain	Course Name	Teaching Scheme					Evaluation Scheme					TOTAL
			L	T	P	SL	Credit	Schem e	Theory		Practical		
									Max.	Min. Passin g	Max.	Min. Passing	
0UBCPC601	F,E,R	Generative AI	2	0	0	2	2	ISE	10	40*		0	50
							MSE	10					
							ESE	30					
0UBCPE602	F,E,R	602.1 Professional Elective VI (Data Science)	4	0	0	4	4	ISE	10	40*		0	100
		602.2 Professional Elective VI (Artificial Intelligence & Machine Learning)						MSE	20				
		602.3 Professional Elective VI Full Stack Devn.)						ESE	10		0		
0UBCPE603	F,E,R	603.1 Professional Elective VII (Data Science)	4	0	0	4	4	ISE	10	40*		0	100
		603.2 Professional Elective VII (Artificial Intelligence & Machine Learning)						MSE	20				
		603.3 Professional Elective VII Full Stack Devn.)						ESE	10		0		
0UBCPC604	F,E,R	Generative AI Lab	0	0	4	1	2	ISE			20	25**	50
							ESE			30			
0UBCPE605	F,E,R	Professional Elective-VI Lab	0	0	4	1	2	ISE			20	25**	50
							ESE			30			
0UBCPE606	F,E,R	Professional Elective-VII Lab	0	0	4	1	2	ISE			20	25**	50
							ESE			30			
0UBCHM607	F	Entrepreneurship and Startup Ecosystem	2	0	0	2	2	ISE	10	40*		0	50
								MSE	10				
								ESE	30				
0UBCAE608	F	Soft Skills	2	0	0	2	2	ISE	10	40*		0	50
								MSE	10				
								ESE	30				
0UBCPR609	F,E,R	Mini Project	0	0	4	1	2	ISE			20	25**	50
								MSE			30		
TOTAL			14	0	16	18	22		230		200		550
Total Contact Hours Per Week			30										
Course Category	Program me Core Course	Programme Elective Course	Open Electi ve Cours e	Multi Disci plina ry Mino r	Value Educa tion	Vocation al and Skill Enhance ment Course	Ability Enhance ment Course	Human ities and Manag ement Course	Interns hip	Project	Co -curr icula r Cours es	Total	
Sem VI	PC	PE	OE	MD	VE	VS	AE	HM	IR	PR	CC	22	
Credit	4	12	0	0	0	0	2	2	0	2	0		
ISE : In-semester Evaluation , MSE: Mid Semester Examination , ESE: End Semester Examination													
Note 1:													
* ISE + MSE = 40%, ESE = 40%, and the combined together needs to be 40% for passing Theory Course													
** ISE = 40%, ESE = 50%, and the combined together need to be 50% for passing Lab Courses.													
Internship : Students are expected to complete 60 Days of internship after the Fourth semester(Summer), and its evaluation will be conducted in the Fifth semester.													


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1. **BACHELOR IN COMPUTER APPLICATION** Degree will be awarded, if a student wishes to exit at the end of Third year.

Exit Criteria after Third Year of BCA Programme

The students shall have an option to exit after 3rd year of Computer Application Program and will be awarded with a Bachelor's in Computer Application.

Re-entry Criteria in to Fourth Year (Seventh Semester)

The student who takes an exit after third year with an award of BCA may be allowed to re-enter in to Seventh Semester for completion of the BCA (Honours) or BCA (Honours with Research) Program as per the Institute schedule after earning requisite credits in the Third year. **Minimum eligibility criteria for opting the course in the fourth year will be as follows:**

1. **BCA (Honours with Research):** BCA Degree

2. **For BCA (Honours):** BCA Degree



BCA-IV SEMESTER VII (Honors)

Course Code	Course Domain	Course Name	Teaching Scheme					Evaluation Scheme					TOTAL
			L	T	P	SL	Credit	Scheme	Theory		Practical		
									Max.	Min. Passing	Max.	Min. Passing	
0UBCP701	F,E,R	Social Network Analysis	2	0	0	2	2	ISE MSE ESE	10 10 30	40*		0	50
0UBCP702	F,E,R	Optimization of ML	4	0	0	4	4	ISE MSE ESE	20 20 60	40*		0	100
0UBCP703	F,E,R	703.1 Professional Elective VIII (Data Science) 703.2 Professional Elective VIII (Artificial Intelligence & Machine Learning) 703.3 Professional Elective VIII Full Stack Devp.)	4	0	0	4	4	ISE MSE ESE	10 20 10	40*		0	100
0UBCP704	F,E,R	704.1 Professional Elective IX (Data Science) 704.2 Professional Elective IX (Artificial Intelligence & Machine Learning) 704.3 Professional Elective IX Full Stack Devp.)	4	0	0	4	4	ISE MSE ESE	10 20 10	40*		0	100
0UBCP705	F,E,R	Optimization of ML Lab	0	0	4	1	2	ISE ESE			20 30	25**	50
0UBCP706	F,E,R	Professional Elective – VIII Lab	0	0	4	1	2	ISE ESE			20 30	25**	50
0UBCP707	F,E,R	Professional Elective – IX Lab	0	0	4	1	2	ISE ESE			20 30	25**	50
0UBCP708	F,E,R	Internship	0	-	4	1	2	ISE ESE			20 30	25**	50
TOTAL			14	0	16	18	22		230		200		550
Total Contact Hours Per Week			30										
Course Category	Programme Core Course	Programme Elective Course	Open Elective Course	Multi Disciplinary Minor Course	Value Education	Vocational and Skill Enhancement Course	Ability Enhancement Course	Humanities and Management Course	Internship	Project	Co-curricular Courses	Total	
Sem VII	PC	PE	OE	MD	VE	VS	AE	HM	IR	PR	CC		
Credit	8	12	0	0	0	0	0	0	2	0	0	22	

ISE: In-semester Evaluation, MSE: Mid Semester Examination, ESE: End Semester Examination

Note 1:

* ISE + MSE = 40%, ESE = 40%, and the combined together needs to be 40% for passing Theory Course.

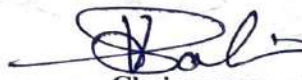
** ISE = 40%, ESE = 50%, and the combined together need to be 50% for passing Lab Courses.

Internship: Students are expected to complete 60 Days of internship after the Fourth semester (Summer), and its evaluation will be conducted in the Fifth semester.


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BCA-IV SEMESTER VIII (Honors)

Course Code	Course Domain	Course Name	Teaching Scheme					Evaluation Scheme					TOTAL
			L	T	P	SL	Credit	Scheme	Theory		Practical		
									Max.	Min. Passing	Max.	Min. Passing	
0UBCP001	F,E,R	801.1 Professional Elective X (Data Science)	4	0	0	4	4	ISE	10	40*	0	0	100
		MSE						20					
		ESE						10					
0UBCP002	F,E,R	802.1 Professional Elective XI (Data Science)	4	0	0	4	4	ISE	10	40*	0	0	100
		MSE						20					
		ESE						10					
0UBCP003	F,E,R	803.1 Professional Elective XII (Data Science)	4	0	0	4	4	ISE	10	40*	0	0	100
		MSE						20					
		ESE						10					
0UBCP004	F,E,R	Professional Elective-X Lab	0	0	4	1	2	ISE			20	25**	50
0UBCP005	F,E,R	Professional Elective-XI Lab	0	0	4	1	2	ISE			20	25**	50
								ESE			30		
0UBCP006	F,E,R	Professional Elective-XI Lab	0	0	4	1	2	ISE			20	25**	50
								ESE			30		
0UBCP007	F,E,R	Dissertation Work	0	-	8	4	4	ISE			40	25**	100
								ESE			60		
TOTAL			12	0	20	19	22		120		250		550
Total Contact Hours Per Week			32										
Course Category	Programme Core Course	Programme Elective Course	Open Elective Course	Multi Disciplinary Minor Course	Value Education	Vocational and Skill Enhancement Course	Ability Enhancement Course	Humanities and Management Course	Internship	Project	Co-curricular Courses	Total	
Sem VII	PC	PE	OE	MD	VE	VS	AE	HM	IR	PR	CC	22	
Credit	0	18	0	0	0	0	0	0	0	4	0		

ISE: In-semester Evaluation, MSE: Mid Semester Examination, ESE: End Semester Examination

Note 1:

* ISE + MSE = 40%, ESE = 40%, and the combined together needs to be 40% for passing Theory Course.

** ISE = 40%, ESE = 50%, and the combined together need to be 50% for passing Lab Courses.

Internship: Students are expected to complete 60 Days of internship after the Fourth semester (Summer), and its evaluation will be conducted in the Fifth semester.


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BCA-IV SEMESTER VII (Honors with Research)

Course Code	Course Domain	Course Name	Teaching Scheme					Evaluation Scheme					TOTAL
			L	T	P	Credit	Scheme	Theory		Practical			
								Max.	Min. Passing	Max.	Min. Passing		
0UBCPC701	F,E,R	Advanced Data Analysis Tools	4	0	0	4	4	ISE	10	40*	0	100	
								MSE	20				
								ESE	10				
0UBCPE702	F,E,R	702.1 Professional Elective VIII (Data Science) 702.2 Professional Elective VIII (Artificial Intelligence & Machine Learning) 702.3 Professional Elective VIII Full Stack Devp.)	4	0	0	4	4	ISE	10	40*	0	100	
								MSE	20				
								ESE	10				
0UBCPE703	F,E,R	703.1 Professional Elective IX (Data Science) 703.2 Professional Elective IX (Artificial Intelligence & Machine Learning) 703.3 Professional Elective IX Full Stack Devp.)	4	0	0	4	4	ISE	10	40*	0	100	
								MSE	20				
								ESE	10				
0UBCRM704	F,E,R	Research Methodology	2	0	0	2	2	ISE	10	40*	0	50	
								MSE	10				
								ESE	30				
0UBCPC705	F,E,R	Lab based on 701	0	0	4	1	2	ISE		20	25**	50	
								ESE					30
0UBCPE706	F,E,R	Lab based on 704	0	0	4	1	2	ISE		20	25**	50	
								ESE					30
0UBCPE707	F,E,R	Lab based on 705	0	0	4	1	2	ISE		20	25**	50	
								ESE					30
0UBCIR708	F,E,R	Research Internship Report and Viva – Voce	0	0	4	1	2	ISE		20	25**	50	
								ESE					30
TOTAL			14	0	16	18	22		170		200	550	
Total Contact Hours Per Week			30										
Course Category	Programme Core Course	Programme Elective Course	Open Elective Course	Multi Disciplinary Minor Course	Value Education	Vocational and Skill Enhancement Course	Ability Enhancement Course	Humanities and Management Course	Inter nship	Project	Research Methodology	Total	
Sem VII	PC	PE	OE	MD	VE	VS	AE	HM	IR	PR	RM	22	
Credit	6	12	0	0	0	0	0	0	2	0	2		

ESE: In-semester Evaluation, MSE: Mid Semester Examination, ESE: End Semester Examination

Note 1:

* ESE+ MSE= 40%, ESE= 40%, and the combined together needs to be 40% for passing Theory Course

** ESE= 40%, ESE= 50%, and the combined together need to be 50% for passing Lab Courses.

Internship: Students are expected to complete 60 Days of internship after the Fourth semester (Summer), and its evaluation will be conducted in the Fifth semester.


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BCA-IV SEMESTER VIII (Honors with Research)

Course Code	Course Domain	Course Name	Teaching Scheme					Evaluation Scheme				TOTAL	
			L	T	P	SL	Credit	Scheme	Theory		Practical		
									Max.	Min. Passing	Max.		Min. Passing
0UBCPR801	E,R	Dissertation (For Research Track)*	-	-	22	18	22	ISE			150	225*	550
								ESE			400		
Total							22		550				550
Course Category	Programme Core Course	Programme Elective Course	Open Elective Course	Multi Disciplinary Minor Course	Value Education		Vocational and Skill Enhancement	Ability Enhancement Course	Humanities and Management	Internship	Project	Research Methodology	Total
Sem VII	PC	PE	OE	MD	VE		VS	AE	HM	IR	PR	RM	
Credit	0	0	0	0	0		0	0	0	0	22	0	22

Examination Pattern

- ISE 1: In-semester Evaluation 1
- ISE 2: In-semester Evaluation 2
- MSE: Mid Semester Examination
- ESE: End Semester Examination

Note 1:

ISE = 40%, ESE = 50%, and the combined total needs to be 50% for passing Lab Courses.


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Proposed Streams for Program Electives (PE)

1. Data Science

SLNo	Semester	Course Code- (Theory)	Course Code- (Practical)	Professional Elective
1	III	0UBCPE305	0UBCPE309	Introduction to Data Science
2	IV	0UBCPE404	0UBCPE408	Basics of Data Analytics using Spreadsheets
3	V	0UBCPE501.1	0UBCPE504	Data Visualization using Power BI
4	V	0UBCPE502.1	0UBCPE505	Business Intelligence & Analytics
5	V	0UBCPE502.1	0UBCPE506	Exploratory Data Analysis
6	VI	0UBCPE602.1	0UBCPC604	Machine Learning
7	VI	0UBCPE603.1	0UBCPC605	Time Series Analysis
8	VII	0UBCPE703	0UBCPE706	Data Mining & Warehousing
9	VII	0UBCPE704	0UBCPE707	Big Data Analytics
10	VIII	0UBCPE801	0UBCPE801	Advanced Data Visualization
11	VIII	0UBCPE802	0UBCPE802	Cloud Computing for Data Analytics
12	VIII	0UBCPE803	0UBCPE803	Data Security & Privacy

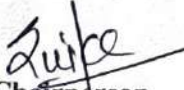
2. Artificial Intelligence & Machine Learning

SLNo	Semester	Course Code- (Theory)	Course Code- (Practical)	Professional Elective
1	III	0UBCPE305	0UBCPE309	Introduction to Machine Learning
2	IV	0UBCPE404	0UBCPE408	Data Preprocessing and Feature Engineering
3	V	0UBCPE501.2	0UBCPE504	Predictive Analytics
4	V	0UBCPE502.2	0UBCPE505	Neural Networks
5	V	0UBCPE502.2	0UBCPE506	Digital Image Processing
6	VI	0UBCPE602.2	0UBCPC604	Natural Language Processing
7	VI	0UBCPE603.2	0UBCPC605	Deep Learning for Computer Vision
8	VII	0UBCPE703	0UBCPE706	Speech Recognition
9	VII	0UBCPE704	0UBCPE707	Explainable AI (XAI)
10	VIII	0UBCPE801	0UBCPE801	Evolutionary Algorithms
11	VIII	0UBCPE802	0UBCPE802	Augmented Reality & Virtual Reality
12	VIII	0UBCPE803	0UBCPE803	Security Aspects of Machine Learning

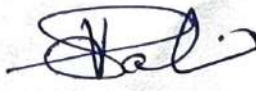
3. Full Stack Development

SLNo	Semester	Course Code- (Theory)	Course Code- (Practical)	Professional Elective
1	III	0UBCPE305	0UBCPE309	Web Programming – I
2	IV	0UBCPE404	0UBCPE408	AJAX & jQuery
3	V	0UBCPE501.3	0UBCPE504	Web Programming – II (PHP)
4	V	0UBCPE502.3	0UBCPE505	Advanced PHP & MySQL
5	V	0UBCPE502.3	0UBCPE506	Advanced Java
6	VI	0UBCPE602.3	0UBCPC604	.NET Technology
7	VI	0UBCPE603.3	0UBCPC605	Emerging Web Technology
8	VII	0UBCPE703	0UBCPE706	Web Content Management
9	VII	0UBCPE704	0UBCPE707	Web Application Security
10	VIII	0UBCPE801	0UBCPE801	Web Services & API Basics
11	VIII	0UBCPE802	0UBCPE802	E-Commerce Website Development
12	VIII	0UBCPE803	0UBCPE803	Full Stack Web Development & DevOps


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SEMESTER –I

Class	B.C.A. Sem. –I
Course Code and Course Title	0UBCPC101 C Programming Language
Prerequisite/s	-
Teaching Scheme: Lecture/Tutorial/Practical	48/00/00
Credits	04
Evaluation Scheme: ISE / MSE / ESE	20/20/60

Course Outcomes (COs): Upon successful completion of this course, the student will be able to:		Bloom's Level
0UBCPC101_1	Understand and apply problem-solving techniques using algorithms, flowcharts, pseudocode, and basic data structures to analyze and solve computational problems systematically.	L2 , L3
0UBCPC101_2	Apply C programs using identifiers, variables, constants, data types, operators, expressions, input/output functions, and implement decision-making and looping constructs using conditional statements and iterative control structures to solve computational problems.	L3
0UBCPC101_3	Implement and analyze modular C programs using functions, recursion, arrays, searching, and sorting techniques for efficient problem solving.	L3, L4
0UBCPC101_4	Apply and analyze C programs using strings, pointers, structures, and file handling concepts to develop efficient solutions for computational problems.	L3 , L4

Course Contents:

Unit 1	Introduction to Programming Problem Solving- Classification of Problems, Analysis of Problems, Solution Approaches, Problem-Solving Steps (Understand the Problem, Plan, Execute, And Review), Types of Computational Problems, , Breaking the Problem into Sub problems Algorithms, Flowcharts: Algorithm Definition & Development, Steps of algorithm, Analysis of Algorithm, Efficiency, Correctness Flow charts with examples. Role of Data Structures in Problem Solving. Introduction to C- , Different Generations of Programming Languages, Introduction to C, History of C Language, Features of C-Structure of C Program, Translating Algorithm to C Program. Identifiers, Tokens and Keywords, Variables and constants. Input and Output Functions.	12 Hours
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Unit 2	Data types - Basic data types, Type casting Types of Operators -arithmetic operators, Increment Decrement operators, Relational and logical operators, Bit wise operators, Assignment operators. Operator Precedence and Associativity. Expressions Decision Making Statements - If Statement, If-Else Statement, if-else-if, Nested if, Switch case. Looping Statements - Different Kinds of repetition, Entry Controlled, Exit Controlled, Counter Controlled, Definite, Indefinite and Sentinel-Controlled Repetitions. For, while, do while. Control Structure Stacking and Nesting, Break, and continue statement	12 Hours
Unit 3	Functions :, Function Definition, Function Declaration, Function Calling, Parameter Passing, Return Values, and Recursive Functions. Arrays :Array Declarations, including One-Dimensional Arrays, Two-Dimensional Arrays, Arrays & Function, Searching, and Bubble Sort. Strings : String Declaration and Initialization and String Input and Output. Standard String Library Functions, String Manipulation	12 Hours
Unit 4	Pointers : Introduction to Pointers, Pointer Arithmetic, Pointers and Arrays, and Passing Arrays to Functions. Structures : Declaration and Initialization, Array of Structures, and Nested Structures. File Handling : File Concepts, Opening and Closing Files, Reading and Writing Files, File Modes, and Command Line Arguments (Introduction).	12 Hours

Text Books

Sr. No	Title	Author	Publisher	Edition	Year of Edition
1	Practical C Programming for Problem Solving	Venkatesh, Nagaraju Y.	Khanna Book Publishing Company	First Edition	2024
2	AICTE's Programming for Problem Solving (With Lab Manual)	AICTE Expert Committee	Khanna Book Publishing Company	First Edition	2024
3	C How to Program	Harvey Deitel and Paul Deitel	Pearson India	9th Edition	2015
4	How to Solve It by Computer	R. G. Dromey	Pearson Education	First Edition	1982

Reference Books

Sr. No.	Title	Author	Publisher	Edition	Year of Edition
1.	Let Us C	Yashavant P. Kanetkar	BPB Publications	18th Edition	2020
2.	The C Programming Language	Brian W. Kernighan and Dennis M. Ritchie	Pearson	2nd Edition	2015
3.	Problem Solving and Program Design in C	John R. Hanly and Elliot B. Koffman	Pearson	8th Edition	2015



E- Learning Resources

Sr. No.	Title	Course Instructor	Platform	Web link
1	Programming in C	Prof. S. N. Sivanandam	NPTTEL/SW AYAM	https://onlinecourses.nptel.ac.in
2	Problem Solving Through Programming in C	Prof. Anupam Basu	NPTTEL/SW AYAM	https://swayam.gov.in
3	Introduction to Programming in C	Faculty of Indian Institute of Technology Kharagpur	NPTTEL/SW AYAM	https://onlinecourses.nptel.ac.in
4	Programming for Everybody (Getting Started with C Concepts)	Charles Severance	Coursera	https://www.coursera.org

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Class	B.C.A. Sem. –I
Course Code and Course Title	0UBCPC102, Computer Architecture
Prerequisite/s	-
Teaching Scheme: Lecture/Tutorial/Practical	48/00/00
Credits	04
Evaluation Scheme: ISE / MSE / ESE	20/20/60

Course Outcomes (COs):		Bloom's Level
Upon successful completion of this course, the student will be able to:		
0UBCPC102_1	To Understand the basics of Digital Electronics and Binary Number System	L2
0UBCPC102_2	To Learn the implementation of Combinational Circuit..	L3
0UBCPC102_3	To Learn the implementation of Sequential Circuit.	L3
0UBCPC102_4	To Understand the Organization of basic computers and concept of memory organization	L2

Course Contents:		
Unit 1	Digital Principles: Definition for Digital signals, Digital logic, Boolean Laws and Theorems, K-Map: Truth Tables to K-Map, 2, 3 and 4 variable K Map, K-Map Simplifications, Don't Care Conditions, SOP and POS.	12 Hours
Unit 2	Number Systems and Codes Decimal, Binary, Octal and Hexadecimal Number Systems. Number System Conversions. Binary Arithmetic. BCD Arithmetic. Octal Arithmetic. Hexadecimal Arithmetic. Decimal Codes. Error Detecting and Error Correcting Codes. Excess-3 Code. Gray Code. Representation of Data: Representation of Integers: Signed Magnitude Form, 1's Complement And 2's Complement. Representation of Real Numbers: IEEE 754 Floating Point Representation. Representation of Characters: ASCII, UNICODE.	12 Hours
Unit 3	Combinational Circuits: Half Adder and Full Adder, Subtractor, Decoders, Encoder, Multiplexer, Demultiplexer. Sequential Circuits: Flip-Flops- SR Flip- Flop, D Flip-Flop, J-K Flip-Flop, T FlipFlop. Register: 4 bit register with parallel load, Shift Registers- Bidirectional shift register with parallel load. Binary Counters-4 bit synchronous and Asynchronous binary counter	12 Hours
Unit 4	Basic computer functions and interconnections- Computer components, computer function, instruction fetch and execute, interrupts, I/O functions. Interconnection structures – Bus interconnections, point to point interconnect. , Computer Registers- Types of registers: Program Counter (PC), Accumulator (AC), Instruction Register (IR). Memory Organization: Memory Hierarchy, Main Memory, Auxiliary memory, Associate Memory, Cache Memory, Virtual Memory, Memory Management Hardware	12 Hours



Text Books

Sr. No	Title	Author	Publisher	Edition	Year of Edition
1	"Digital Principles & Applications"	Donald P Leach, Albert Paul Malvino, Goutam Saha	Tata McGraw Hill Education Private Limited	Eighth	2011
2	"Computer System Architecture"	M. Morris Mano	Pearson/Phi	Third	2007
3	Modern Digital Electronics	R. P. Jain	Tata McGraw Hill Education Private Limited	Fourth	2010
4	Foundations of Computer Architecture	Dr.Samiksha V .Nikam	-	Latest	2025

Reference Books

Sr. No.	Title	Author	Publisher	Edition	Year of Edition
1	Computer Organization and Architecture	William Stallings	Pearson/PHI	Sixth	2003
2	Structured Computer Organization	Andrew S. Tanenbaum	PHI /Pearson	Fourth	1999
3	Switching Theory and Logic Design	M. V. Subramanyam	Laxmi Publications (P) Ltd.	Second	2005
4	Computer Organization Architecture	Ikvinderpal Singh	Khanna Book Publishing	First	2021

E- Learning Resources

Sr. No	Title	Course Instructor	Platform	Web link
1	Introduction to Electronic Circuits	Prof. S. C. Dutta Roy (IIT Delhi)	NPTEL/SWAYAM	https://nptel.ac.in/courses/108102097?utm_source=chatgpt.com
2	Digital Electronic Circuits	Prof. Goutam Saha (IIT Kharagpur)	NPTEL/SWAYAM	https://onlinecourses.nptel.ac.in/noc25_e20/preview
3	Computer Organization and Architecture	Prof. Smruti R. Sarangi (IIT Delhi)	NPTEL/SWAYAM	https://onlinecourses.nptel.ac.in/noc21_cs41/preview
4	Computer Architecture and Organization	Prof. Indranil Sengupta & Prof. Kamalika Datta (IIT Kharagpur)	NPTEL/SWAYAM	https://nptel.ac.in/courses/106105163

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Class	B.C.A. Sem. -I
Course Code and Course-Title	0UBCOE103:Mathematics Foundation to Computer Science-I
Prerequisite/s	-
Teaching Scheme: Lecture/Tutorial/Practical	48/00/00
Credits	04
Evaluation Scheme: ISE / MSE / ESE	20/20/60

Course Outcomes (COs): Upon successful completion of this course, the student will be able to:		Bloom's Level
0UBCOE104 _1	Compute basic fundamental of mathematical concepts such as set theory and solve the problems involving types of relation and composition of function and inverse of function	L3
0UBCOE104 _2	Apply counting techniques, recurrence relations, and number theory principles to solve discrete mathematical problems.	L3
0UBCOE104 _3	Apply the principles of matrix algebra, including types, operations, and rank, to evaluate determinants and inverses for solving systems of linear equations.	L3
0UBCOE104 _4	Demonstrate the problems isomorphism of graph complement of graph	L3

Course Contents:		
Unit 1	Set, Relation and Function Definition of Set, Methods of describing Set: Tabular form, Set-builder form, Types of Sets, Cardinality of Set Operations on Sets: Union, Intersection, Difference of Sets, De Morgan's Law, Venn Diagram, Cartesian product of two sets, Idempotent laws, Identity laws, Commutative laws, Associative laws, Distributive laws, Inverse laws (Examples based on above mentioned laws), Power Set, Definition of Relation, Domain, Co-domain, Range of Relation, Types of Relations, Equivalence Relation and partition of a set, Closure of Relations. Definition of Function, Types of Function, Representation of function, Properties of functions, Composition of functions, Surjective(onto), injective(one to one) and Bijective functions, Inverse of functions, Exponential and Logarithmic functions	12 Hours
Unit 2	Counting and Recurrence Relation: Basics of counting, Pigeonhole principle, permutation, combination, Binomial coefficients, Binomial theorem and its application polynomial expansion, Recurrence relations, modeling recurrence relations with examples, like Fibonacci numbers. Properties of Integer and Mathematical Induction: Prime numbers, Fundamental theorem of arithmetic, Definition of GCD, LCM, Theorems on Euclidean algorithm and problems Mathematical Induction: Principles and Problems	12 Hours
Unit 3	Matrix Algebra Definition and Order of Matrix, Types of Matrices, Algebra of Matrices-Addition, Subtraction, Multiplication, Scalar Multiplication of matrices, Rank of Matrix Determinant of Matrix of order(2x2 and 3x3) and Examples Inverse of Matrix, System of linear equation	12 Hours
Unit 4	Elementary Graph Theory Basic terminologies of graphs, Handshaking Lemma, Isomorphism of graphs,	12



connected and disconnected graphs, subgraphs, Complement of graph, paths and cycles, complete graphs, digraphs, weighted graphs	Hours
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Text Books

Sr. No	Title	Author	Publisher	Edition	Year of Edition
1	Engineering Mathematics	Garg, Reena	Khanna Book Publishing Company(AICTE Recommended Textbook)	-	2024
2	Discrete Mathematical Structures	Kolman B., Busby R. and Ross S.,	Pearson Education	6th Edition	2015
3	Advanced Engineering Mathematics	Garg, Reena	Khanna Book Publishing Company	-	2023
4	Graph Theory with Application to Engineering and Computer Science	Deo Narsingh	Prentice Hall, India	-	1979

Reference Books

Sr. No.	Title	Author	Publisher	Edition	Year of Edition
1	Discrete and Combinatorial Mathematics: An Applied Introduction	Grimaldi Ralph P. and Ramana B.V	Pearson Education	5 th	2007
2	Discrete mathematical structure with application to computer science	Trembley and Manohar	McGraw Hill	-	1987
3	Discrete Mathematics and its Applications	Rosen Kenneth H. and Krithivasan Kamala,	McGraw Hill, India	-	2015
4.	Introduction to Graph Theory	West Douglas B.	Pearson Education,	2 nd	2015

E- Learning Resources

Sr. No.	Title	Course Instructor	Platform	Web link
1	Discrete Mathematics,	Prof.Sajit Gopalan, Prof.Benny,George K IIT Guwahati	NPTEL	https://nptel.ac.in/courses/106103205
2	Basic Linear Algebra	Prof. I.K.Rana IIT Bombay	NPTEL	https://nptel.ac.in/courses/111101115

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Class	B.C.A. Sem. –I
Course Code and Course Title	0UBCIK104, Indian Vision
Prerequisite/s	-
Teaching Scheme: Lecture/Tutorial/Practical	24/00/00
Credits	02
Evaluation Scheme: ISE / MSE / ESE	10/10 /30

Course Outcomes (COs):		Bloom's Level
Upon successful completion of this course, the student will be able to:		
0UBCMD104_1	Explain the concept of “Vasudhaiva Kutumbkam” and its realization process as an base for the development of vision for a human society.	L2
0UBCMD104_2	Identify the universality in humans and its coexistence in existence.	L2
0UBCMD104_3	Demonstrate the sense of responsibility, duties, and participation of individual for establishment of fearless society.	L3
0UBCMD104_4	Explain the apparently rational, verifiable and universal solution from ancient Indian knowledge system for the holistic development of physical, mental and spiritual wellbeing of one and all, at the level of individual, society, nation and ultimately the whole world.	L2

Course Contents:		
Unit 1	The world view & Vision of Human Society The concept of non-duality of Prakriti (Jad) and Purush (Chetana), human as coexistence of Jad & Chetan, Pancha-mahabhutas, the root of sorrow and suffering, freedom from sorrow, salvation, eternal peace truth (vyaharika satya), ultimate truth. The acceptance of various systems of philosophy for realization of truth and complementariness in society in ancient Indian system.	06 Hours
Unit 2	Aspiration and Purpose of Individual and Human Society Aims of Human life; at individual level and societal level. At societal level; Four purusarthas Dharma, Artha, Kama, Moksha. Individual level; Abhyudaya (progress), Nihisreyasa (perfection) Pravrtti, Nivrtti. Dharma; Dharma sutras (Gautama, Apastamba, Baudhayana, Vasistha). Dharma-Shastra; (Manusmriti, Naradamrti, Visnusmrti, Yajnavalkya Smriti) sociology, different stages of life like studenthood, householdership, retirement and renunciation, rites and duties, judicial matters, and personal laws (Aachara, Vyavahara, Prayaschitta). Artha; Kautliya Arthashastra, Kamandakiya Nitisara, Brihaspati Sutra, Sukra Niti, Moksha: Human liberation (Ignorance to Knowledge)	06 Hours
Unit 3	Program for Ensuring Human Purpose at Individual and Societal Level –I	06 Hours



	Fundamental concept of Nitishastra: Satyanishtha Aur Abhiruchi (Ethics, Integrity & aptitude). The true nature of self; Shiksha Valli, Bhriugu Valli (concept of Atman-Brahman (self, soul). The true constitution of Human: Ananda Valli (Annamaya Kosha, Pranamaya Kosha, Manomaya Kosha, Vijnanamaya Kosha, Anandamaya Kosha). The four states of consciousness (Waking state, Dreaming state, Deep Sleep State, Turiya the fourth state), Consciousness (seven limbs and nineteen mouths), Prajna, Awareness. The Life Force Prana (Praana-Apaana-Vyaana-Udaana-Samaana)	
Unit 4	Program for Ensuring Human Purpose: at Individual and Societal Level – II Differentiating Vidya and Avidya, human bondages, Higher and Lower Knowledge (Para Vidhya & Apra Vidhya). Concept of Sattva, Rajas, Tamas and need of balancing the same, Patanjali yog sutra; Yama, Niyama, Asanas, pranayams, pratyahara, dharna, dhyana, Samadhi, Sixteen category of padartha, pramans (pratyaksh, anumana, upaman, shabda). Saadhana chatushtayam (viveka, vairagya, mumukshatavam, shadsampathi (sama, dama, uparama, titiksha, shraddha, samadhana), Understanding Nitya karma, Naimittika Karma, Kamya karma, prayaschitta karma, Nishidha Karma. Meditation and Progressive meditation (Narada's education), Ativadin to self knowledge, Jyan yog, Karma yog, sanyas yog in aspect to harmonious practice in society.	06 Hours

Text Books

Sr. No	Title	Author	Publisher	Edition	Year of Edition
1	Communication Skills in English (with Lab Manual)	Anjana Tiwari	Khanna Book Publishing Co., New Delhi	First	2020
2	Effective Communication Skills	Iqbal Husain	Kul Bhushan Kumar	First	2018
3	Practical English Usage	Michael Swan	Oxford University Press	Fourth	2016
4	Communication Skills	Sanjay Kumar & Pushp Lata	Oxford University Press	Second	2018

Reference Books

Sr. No.	Title	Author	Publisher	Editi on	Year of Editio n
1	Ancient Indian Society	Swami Chidatman Jee Maharaj	Anmol Publications Pvt. Ltd.	First	2009
2	Society in Ancient India: Evolution Since the Vedic Times Based on Sanskrit, Pali, Prakrit and Other Classical Sources	S. C. Banerji (often spelled Banerjee)	D.K. Printworld, New Delhi	First	2001
3	The Four Values in Indian Philosophy and Culture	N. Rao	University of Mysore, Mysore	First	1970



4.	The Structure of Scientific Revolutions	Thomas S. Kuhn	University of Chicago Press	Second	1970
5.	Indian Knowledge Systems, Vol. 1	Kapil Kapoor & A. K. Singh (Editors)	Indian Institute of Advanced Study, Shimla	First	2005

E- Learning Resources

Sr. No	Title	Course Instructor	Platform	Web link
1	English Language for Competitive Exams	Prof. Aysha Iqbal Viswamohan	NPTTEL / SWAYAM	https://nptel.ac.in/courses/109106116?utm_source=chatgpt.com
2	Technical English for Engineers	Prof. Aysha Iqbal Viswamohan	NPTTEL / SWAYAM	Technical English for Engineers


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Class	B.C.A. Sem. –I
Course Code and Course Title	0UBCVS105 GENERAL ENGLISH- I
Prerequisite/s	-
Teaching Scheme: Lecture/Tutorial/Practical	24/00/00
Credits	02
Evaluation Scheme: ISE / MSE / ESE	10 /10 /30

Course Outcomes (COs):		Bloom's Level
Upon successful completion of this course, the student will be able to:		
0UBCVS105_1	Explain the concepts of vocabulary building, word formation, sentence structure, phrases, and clauses in the English language.	L2
0UBCVS105_2	Apply appropriate vocabulary, sentence structures, punctuation, and grammatical rules in written communication.	L3
0UBCVS105_3	Identify and correct common errors in English writing, including errors related to subject-verb agreement, articles, prepositions, modifiers, and redundancies.	L3
0UBCVS105_4	Demonstrate effective oral and written communication skills through listening, pronunciation, group communication, presentations, comprehension, precise writing, and essay writing.	L3

Text Books

Sr. No	Title	Author	Publisher	Edition	Year of Edition
1	Technical Communication: Principles and Practice	Meenakshi Raman & Sangeeta Sharma	Oxford University Press	3rd Edition	2017
2	Communication Skills	Sanjay Kumar & Pushp Lata	Oxford University Press	2nd Edition	2018
3	Effective Technical Communication	M. Ashraf Rizvi	McGraw Hill Education	2nd Edition	2017
4	Business Communication Today	Bovee, Thill & Chatterjee	Pearson	14th Edition	2020

Reference Books

Sr. No.	Title	Author	Publisher	Edition	Year of Edition
1	Communication Skills	Sanjay Kumar & Pushp Lata	Oxford University Press	2nd Edition	2018
2	Technical Communication: Principles and Practice	Meenakshi Raman & Sangeeta Sharma	Oxford University Press	3rd Edition	2017
3	Effective Technical Communication	M. Ashraf Rizvi	McGraw Hill Education	2nd Edition	2017



Course Contents:		
Unit: I	A)Vocabulary Building The concept of Word Formation, Root words from foreign languages and their use in English, Acquaintance with prefixes and suffixes from foreign languages in English to form derivatives, Synonyms, antonyms, and standard abbreviations. B)Basic Writing Skills Sentence Structures, Use of phrases and clauses in sentences, Importance of proper punctuation, Creating coherence, Organizing principles of paragraphs in documents, Techniques for writing precisely.	6 Hours
Unit: II	Identifying Common Errors in Writing Subject-verb agreement, Noun-pronoun agreement, Misplaced modifiers, Articles, Prepositions, Redundancies B. Nature and Style of sensible Writing Describing, Defining, Classifying, providing examples or evidence, writing introduction and conclusion, Module V: Writing Practices, Comprehension, Precise Writing, Essay Writing	6 Hours
Unit: III	Oral Communication-I Listening Comprehension, Pronunciation, Intonation, Stress and Rhythm, Common Everyday Situations: Conversations and Dialogues, Communication at Workplace, Interviews, Formal Presentations	6 Hours
Unit: IV	Oral Communication -II Listening Comprehension, Pronunciation, Intonation, Stress and Rhythm, Common Everyday Situations: Conversations and Dialogues, Communication at Workplace, Interviews, Formal Presentations	6 Hours
Note: Unit-III and IV should be interactive practice sessions preferably in Language Lab		
Suggested Field Work or Practical Work		
1. Exercises on Word Formation by the Addition of Prefixes and suffixes.		
2. Word formation by conversion, compounding. Exercises on synonyms, antonyms.		
3. Exercises on sentence structure; Phases and clauses.		
Exercises on identifying common errors : Choosing the correct verb; Exercises on noun –pronoun exercise.		
338386568. Exercises on modifiers ; articles , prepositions ,redundancies ; word stress , intonation		
338386624. Exercises on writing short paragraph on given topic ; Exercise on comprehension writing.		
338386736. Exercises on short precise writing on given topic ; short essay writing on given topic or topic of student's choice.		
338387072. Exercise on listening and rewriting short comprehension; Exercises- group communication on given topics		

4	Business Communication Today	Courtland L. Bovee, John V. Thill & Roshan Lal Raina	Pearson	14th Edition	2020
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E- Learning Resources

Sr. No.	Title	Course Instructor	Platform	Web link
1	English for Career Development	Dr. Brian McManus et al.	Coursera (University of Pennsylvania)	https://www.coursera.org/learn/careerdevelopment
2	Technical English for Engineers	NPTEL Faculty	NPTEL / SWAYAM	https://onlinecourses.nptel.ac.in
3	English Communication Skills	IIT Faculty	NPTEL / SWAYAM	https://nptel.ac.in/courses
4	Speaking Effectively	Faculty, Georgia Institute of Technology	Coursera	https://www.coursera.org


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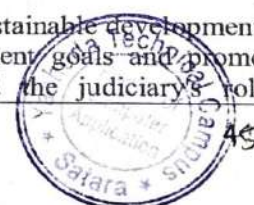


Class	B.C.A. Sem. –I
Course Code and Course Title	0UBCVE106, Environmental Science and sustainability
Prerequisite/s	-
Teaching Scheme: Lecture/Tutorial/Practical	24/00/00
Credits	02
Evaluation Scheme: ISE / MSE / ESE	10 /10 /30

Course Outcomes (COs):		Bloom's Level
Upon successful completion of this course, the student will be able to:		
0UBCVE106_1	Explain basic environmental concepts, natural resources, sustainability, and their relevance to society and business.	L2
0UBCVE106_2	Analyze the interdependence between environmental processes and socioeconomic development.	L4
0UBCVE106_3	Apply sustainable resource management and pollution control measures to address environmental issues.	L3
0UBCVE106_4	Evaluate possible solutions and sustainable practices for addressing environmental problems caused by human and managerial activities.	L5

Course Contents:

Unit 1	Understanding Environment, Natural Resources, and Sustainability Fundamental environmental concepts and their relevance to business operations; Components and segments of the environment, the man-environment relationship, and historical environmental movements. Concept of sustainability; Classification of natural resources, issues related to their overutilization, and strategies for their conservation. Sustainable practices in managing resources, including deforestation, water conservation, energy security, and food security issues. The conservation and equitable use of resources, considering both intergenerational and intergenerational equity, and the importance of public awareness and education.	6 Hours
Unit 2	Ecosystems, Biodiversity, and Sustainable Practices Various natural ecosystems, learning about their structure, functions, and ecological characteristics. The importance of biodiversity, the threats it faces, and the methods used for its conservation. Ecosystem resilience, homeostasis, and carrying capacity, emphasizing the need for sustainable ecosystem management. Strategies for in situ and ex situ conservation, nature reserves, and the significance of India as a mega diverse nation.	6 Hours
Unit 3	Environmental Pollution, Waste Management, and Sustainable Development Various types of environmental pollution, including air, water, noise, soil, and marine pollution, and their impacts on businesses and communities. Causes of pollution, such as global climate change, ozone layer depletion, the greenhouse effect, and acid rain, with a particular focus on pollution episodes in India. Importance of adopting cleaner technologies; Solid waste management; Natural and man-made disasters, their management, and the role of businesses in mitigating disaster impacts.	6 Hours
Unit 4	Social Issues, Legislation, and Practical Applications Dynamic interactions between society and the environment, with a focus on sustainable development and environmental ethics. Role of businesses in achieving sustainable development goals and promoting responsible consumption. Overview of key environmental legislation and the judiciary's role in	6 Hours



environmental protection, including the Water (Prevention and Control of Pollution) Act of 1974, the Environment (Protection) Act of 1986, and the Air (Prevention and Control of Pollution) Act of 1981. Environmental justice, environmental refugees, and the resettlement and rehabilitation of affected populations; Ecological economics, human population growth, and demographic changes in India..

Text Books

Sr. No	Title	Author	Publisher	Edition	Year of Edition
1	Environmental Studies	M. P. Poonia	Khanna Book Publishing Co.	Latest Edition	Latest
2	Textbook of Environmental Studies	Erach Bharucha	Orient Blackswan Pvt. Ltd.	3rd Edition	2020
3	Environmental Studies: From Crisis to Cure	R. Rajagopalan	Oxford University Press	3rd Edition	2018
4	Sustainable Development: Environment, Energy and Water Resources	M. G. Roy	Ane Books Pvt. Ltd.	First	2011

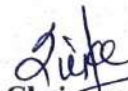
Reference Books

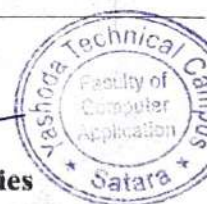
Sr. No.	Title	Author	Publisher	Edition	Year of Edition
1	Living in the Environment	G. Tyler Miller & Scott Spoolman	Cengage Learning	19th Edition	2018
2	Fundamentals of Environmental Studies	M. Basu & S. Xavier Savarimuthu	Cambridge University Press	1st Edition	2017
3	Environmental Science	Daniel D. Chiras	Jones & Bartlett Learning	Tenth	2018
4	Environmental Science: Toward a Sustainable Future	Richard T. Wright & Dorothy F. Boorse	Pearson	Thirteenth	2015

E- Learning Resources

Sr. No.	Title	Course Instructor	Platform	Web link
1	Environmental Science	Prof. Sudha Goel, Prof. Shamik Chowdhury	NPTEL / SWAYAM (IIT Kharagpur)	https://onlinecourses.nptel.ac.in/no_c24_hs160/preview
2	Introduction to Sustainability	University of Illinois	Coursera	https://www.coursera.org/learn/sustainability
3	Ecology and Environment	Prof. Susy Varughese and Team (IIT Madras)	NPTEL/SWAYAM	https://onlinecourses-archive.nptel.ac.in/noc18_ge16/preview
4	Basic Environmental Engineering and Pollution Abatement	Prof. P. Mondal (IIT Roorkee)	NPTEL/SWAYAM	https://onlinecourses.nptel.ac.in/no_c23_ch72/preview


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Class	B.C.A. Sem. –I
Course Code and Course Title	0UBCAE107, German
Prerequisite/s	-
Teaching Scheme: Lecture/Tutorial/Practical	24/00/00
Credits	02
Evaluation Scheme: ISE / MSE / ESE	10/10/30

Course Outcomes (COs):		Bloom's Level
Upon successful completion of this course, the student will be able to:		
0UBCAE107_1	Explain the basic concepts of the German language, including greetings, introductions, alphabets, numbers, personal pronouns, and regular verb conjugation.	L2
0UBCAE107_2	Apply basic German vocabulary and grammatical rules to communicate about hobbies, professions, daily activities, appointments, and personal information.	L3
0UBCAE107_3	Demonstrate basic German communication skills by describing places, buildings, transportation, directions, food items, and shopping situations.	L3
0UBCAE107_4	Use appropriate German vocabulary, sentence structures, articles, verb forms, and the Akkusativ case in simple everyday conversations.	L3

Course Contents:		
Unit 1	A.Introduction to German Language- Level-I Introduction of the language, Greetings, to Introduce oneself, speaking about yourself and others, Alphabets and numbers, Listening of Alphabets and numbers, Reading Information about other people and understanding simple information about them, country names and languages ,Numbers 1 to 100 and listening of numbers Personal pronouns and verb conjugation of regular verbs.	06 Hours
Unit 2	Introduction to German Language-Level-II Speaking about Hobbies. Conjugation of strong verbs and revision of regular verbs. Learning articles and genders of nouns, Singular / Plural noun forms, Learning weekdays, months and Seasons. Speaking about informal appointments Grammar: yes/no questions, Verb position in normal statements and in questions Learning Professions, reading small texts and understanding information about working days, hours, and profession	06 Hours
Unit 3	Demonstrative German Language-Level-I Learning to name the famous places, buildings in a city, name the modes of transportation. Learning definite/ indefinite and negative articles in German to learn to describe the way, Imperative for Pronoun "Sie"	06 Hours



Unit 4	Demonstrative German Language-Level-II Words to speak about food, understanding food items, where one can buy what, Quantities and packing of the grocery items. Subject and object of the sentence and introduction of akkusativ case in German Conversation between shopkeeper and customer, Understanding of Grammar.	06 Hours
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Text Books

Sr. No	Title	Author	Publisher	Edition	Year of Edition
1	Schritte International Neu 1 (A1.1)	Sylvette Penning-Hiemstra et al.	Hueber Verlag	Latest	2016
2	Menschen A1.1 Kursbuch	Monika Overath, Sandr	Hueber Verlag	Latest	2013
3	Studio d A1	Hermann Funk, Christina Kuhn	Cornelsen Verlag	Latest	2005

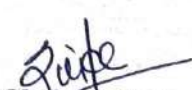
Reference Books

Sr. No.	Title	Author	Publisher	Edition	Year of Edition
1	Netzwerk neu A1 (Deutsch als Fremdsprache) – Kursbuch	Stefanie Dengler, Paul Rusch, Helen Schmitz, Tanja Sieber	Goyal Publishers and Distributors Pvt. Ltd.	A1	2019
2	Netzwerk neu A1 (Deutsch als Fremdsprache) – Arbeitsbuch	Stefanie Dengler, Paul Rusch, Helen Schmitz, Tanja Sieber	Goyal Publishers and Distributors Pvt. Ltd.	A1	2019
3	Netzwerk neu A1 (Deutsch als Fremdsprache) – Testheft	Stefanie Dengler, Paul Rusch, Helen Schmitz, Tanja Sieber	Goyal Publishers and Distributors Pvt. Ltd.	A1	2019

E- Learning Resources

Sr. No.	Title	Course Instructor	Platform	Web link
1	German – I	Prof. Milind Brahme	NPTEL / SWAYAM(IIT Madras)	https://nptel.ac.in/courses/109106190?utm
2	German – II	Prof. Milind Brahme	NPTEL / SWAYAM (IIT Madras)	https://onlinecourses.nptel.ac.in/e-learning/preview/noc19_hs50


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Class	B.C.A. Sem. -I
Course Code and Course Title	0UBCAE107, (Marathi) मराठी
Prerequisite/s	-
Teaching Scheme: Lecture/Tutorial/Practical	24/00/00
Credits	02
Evaluation Scheme: ISE / MSE / ESE	10/10/30

Course Outcomes (COs): Upon successful completion of this course, the student will be able to:		Bloom's Level
0UEEPE316_1	मराठी भाषा व साहित्य अभ्यासाची अभिरुची निर्माण होईल.	L2
0UEEPE316_2	मराठी साहित्याचे आकलन, विश्लेषण व समीक्षण करता येईल.	L4
0UEEPE316_3	मराठी कवितेचे आस्वादन व मूल्यनिर्णय करता येईल.	L5
0UEEPE316_4	वैचारिक व ललित स्वरूपाचे लेखन करता येईल. पत्रव्यवहाराचे कौशल्य अवगत होईल.	L3,L6

Course Contents:		
Unit 1	गद्य - १ - आपला धंदा कोणता व कसा करावा? - दादोबा पांडुरंग तर्खडकर - हिंदी उद्योगधंद्यांच्या गरजा व शिक्षण प्रगतीची दिशा - महाराजा सयाजीराव गायकवाड - मराठी माणूस उद्योगधंद्यात मागे का? - बी. जी. शिर्के - ये है मुंबई मेरी जान - यशवंत राणे	12 Hours
Unit 2	गद्य - २ - चांदणधिकल्या - सलीम सरदार मुल्ला - उद्याच्या सुंदर दिवसासाठी - नागनाथ कोतापल्ले - हाऊसकीपर ते यशस्वी उद्योजक : हणमंतराव गायकवाड - अंजली ठाकूर - लक्ष्मी - राही सरनोबत	12 Hours

Suggested Practical Work / Field Work

मराठी विषयासाठी संबंधित विषयशिक्षकांनी अभ्यासक्रमावर आधारित पुढीलपैकी कोणतेही पाच प्रात्यक्षिक उपक्रम विद्यार्थ्यांकडून करून घ्यावेत. विद्यार्थ्यांनी केलेल्या प्रत्येक प्रात्यक्षिकाची माहिती अहवाल (Report) स्वरूपात सादर करावी.

साधन ग्रंथ

- अरुण काळे : नंतर आलेले लोक, लोकवाङ्मय गृह, मुंबई, २०१०.
- नागनाथ कोतापल्ले : उद्याच्या सुंदर दिवसासाठी, सायन पब्लिकेशन, पुणे, २०१५.
- राजन गवस, अरुण शिंदे, गोमेश पाध्ये : भाषिक सर्जन आणि उपयोजन, दयार्द्र प्रकाशन, पुणे, २०१२.
- वसंत जोशी (संपा.) : एकनाथांची निवडक भारुडे, मेहता पब्लिशिंग हाऊस, पुणे, १९९४.
- अंजली ठाकूर : असाही एक किमयागार, राजहंस प्रकाशन, पुणे.
- यशवंत थोरात : काही वादळ काही वळणं, अनुबंध प्रकाशन, पुणे, २०२३.
- भगवंत देशमुख (संपा.) : एकनाथ वाङ्मयदर्शन, साहित्य अकादमी, नवी दिल्ली, २००३.
- सलीम मुल्ला : ऋतूफेरा, दयार्द्र प्रकाशन, कोल्हापूर.



९. नागनाथ मंजुळे : **उन्हाच्या धगीविरुद्ध**, दीपावली प्रकाशन, पुणे, २०१०.
 १०. राही सरनोबत : **लक्षवेधी मैफल**, दैनिक लोकसत्ता, दिनांक २२ जानेवारी २०१६.
 ११. राहीकर, गो. शं. व गोसावी, र. रा. (संपा.) : **श्री सकल संत गाथा**, प्रकाशक गो. शं. राहीकर, पुणे, १९५५.
 १२. रमेश वरखेडे (संपा.) : **महाराजा सयाजीराव गायकवाड भाषणसंग्रह - भाग १**, महाराजा सयाजीराव गायकवाड चरित्र साधने प्रकाशन समिती, छत्रपती संभाजीनगर, २०१७.
 १३. सरदार, गं. बा. : **एकनाथ दर्शन**, मॉडर्न बुक डेपो प्रकाशन, पुणे, १९७८.
 १४. बी. जी. शिर्के : **उद्योगपर्व**, राजहंस प्रकाशन, पुणे, २०२३.
 १५. बी. जी. शिर्के : **झेप**, राजहंस प्रकाशन, पुणे.

संदर्भ ग्रंथ

१. विलास खोले (संपा.) : **संत जनाबाई आणि अन्य मध्ययुगीन संत कवयित्री यांची कविता**, साहित्य अकादमी, नवी दिल्ली, २०१७.
 २. धनंजय गायकवाड : **राही - ऑलिम्पिक गोलची**, झी मराठी दिशा.
 ३. सयाजीराव गायकवाड : **सयाजीराव गायकवाड यांची भाषणे**, खंड १ ते ५, साकेत प्रकाशन, छत्रपती संभाजीनगर.
 ४. मोनाली गोहे : **दैनिक लोकमत**, दिनांक ३० ऑगस्ट २०१५.
 ५. वि. शं. चौधुले : **मुक्तगद्य**, मॅजेस्टिक प्रकाशन, मुंबई.
 ६. रजनीश जोशी : **दादोबा पांडुरंग तर्खडकर : व्यक्तित्व आणि कर्तृत्व**, इंडस सोर्स बुक्स, मुंबई.
 ७. नसीराबादकर, ल. रा. : **व्यावहारिक मराठी**, भाषाविकास संशोधन संस्था, कोल्हापूर, २०२३.
 ८. पगार, एकनाथ : **महाराजा सयाजीराव गायकवाड**, महाराष्ट्र राज्य साहित्य आणि संस्कृती मंडळ, मुंबई, २०२१.
 ९. पाध्ये, विद्याधर : **मराठी संत कवयित्रींचा इतिहास**, साहित्य अकादमी, नवी दिल्ली, २०१५.
 १०. महेंद्र भवरे : **मराठी कवितेच्या दिशा**, लोकवाङ्मय गृह, मुंबई.
 ११. तारा भवाळकर : **स्त्रीमुक्तीचा आत्मस्वर**, लोकवाङ्मय गृह, मुंबई.
 १२. भांड, बाबा : **युगद्रष्टा महाराजा सयाजीराव गायकवाड**, साकेत प्रकाशन, छत्रपती संभाजीनगर.
 १३. भा. ल. भोळे (संपा.) : **एकोणिसाव्या शतकातील मराठी गद्य**, खंड १, साहित्य अकादमी, नवी दिल्ली, २००६.
 १४. राही सरनोबत : **रिओच्या पूर्णविरामाचा स्वल्पविराम करता आला** (मुलाखत), दैनिक महाराष्ट्र टाइम्स, दिनांक २ जून २०१९.
 १५. **राही सरनोबतचा सुवर्णवेध**, दैनिक महाराष्ट्र टाइम्स, दिनांक २३ ऑगस्ट २०१८.
 १६. रिसोडकर, धनंजय : **सदा सुवर्णवेधी**, दैनिक लोकसत्ता, दिनांक २३ ऑगस्ट २०१८.
 १७. **नवाक्षर दर्शन** (संपा. प्रवीण बांदेकर) : **अरुण काळे विशेषांक**, सावंतवाडी.
 १८. हणमंतराव गायकवाड (मुलाखत) : **माझा कट्टा**, एबीपी माझा.

Text Books

Sr. No	Title	Author	Publisher	Edition	Year of Edition
1	उद्यम झेप - १ (मराठी AEC/SEC अभ्यासक्रमासाठी निर्धारित पाठ्यपुस्तक)	Board of Studies in Marathi, Shivaji University	Shivaji University / Prescribed Publisher	Latest	Latest
2	मराठी (NEP 2.0) - उद्यम झेप-१ (Prescribed Anthology containing the lessons in the syllabus)	Board of Studies	Prescribed Publisher	Latest	Latest



Reference Books

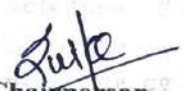
Sr. No.	Title	Author	Publisher	Edition	Year of Edition
1	नंतर आलेले लोक	अरुण काळे	लोकवाङ्मय गृह	1st	2010
2	उद्याच्या सुंदर दिवसासाठी	नागनाथ कोत्तापल्ले	सायन पब्लिकेशन	1st	2015
3	भाषिक सर्जन आणि उपयोजन	राजन गवस, अरुण शिंदे, गोमेश पाध्ये	दयार्द्र प्रकाशन	-	2019
4	भाषिक सर्जन आणि उपयोजन	वसंत जोशी (संपा.)	मेहता पब्लिशिंग हाऊस	-	1994

E- Learning Resources

Sr. No.	Title	Course Instructor	Platform	Web link
1	An Introduction to Indian Literary Theory	Prof. Sreenath V. S.	NPTEL / SWAYAM (IIT Madras)	https://nptel.ac.in/courses/109106195
2	Literary Theory and Literary Criticism	Prof. Aysha Iqbal Viswamohan	NPTEL / SWAYAM (IIT Madras)	https://nptel.ac.in/courses/109106084?utm_source=chatgpt.com


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Class	B.C.A. Sem. –I
Course Code and Course Title	0UBCAE107, हिंदी
Prerequisite/s	-
Teaching Scheme: Lecture/Tutorial/Practical	24/00/00
Credits	02
Evaluation Scheme: ISE/ MSE / ESE	10/10/30

Course Outcomes (COs): Upon successful completion of this course, the student will be able to:		Bloom's Level
0UBCAE107_1	प्रयोजनमूलक हिंदी के प्रति छात्रों में रुचि बढ़ाना।	L2
0UBCAE107_2	प्रयोजनमूलक हिंदी एवं उसकी उपयोगिता से छात्रों को परिचित कराना।	L2
0UBCAE107_3	काव्य एवं कहानी विधा का आस्वाद, विवेचन एवं महत्व समझाना।, साहित्य के माध्यम से नैतिक मूल्य, राष्ट्रीय मूल्य एवं उत्तरदायित्व के प्रति आस्था निर्माण करना।	L3
0UBCAE107_4	हिंदी कवि एवं कहानीकारों तथा उनकी रचनाओं से परिचित कराना।, हिंदी भाषा के श्रवण, पठन, विचार, कल्पना एवं लेखन क्षमता का छात्र में विकास करना।	L2,L3

Course Contents:		
इकाई-I	1. विज्ञापन का स्वरूप एवं महत्त्व। 2. विज्ञापन के अंग। 3. विज्ञापन के उद्देश्य। 4. विज्ञापन के क्षेत्र में रोजगार के अवसर।	12 Hours
इकाई-II	कविताएँ 1. आ: धरती कितना देती है — सुमित्रानंदन पंत 2. जीवन का झरना — आरसी प्रसाद सिंह 3. पहचान — डॉ. देवेंद्र दीपक 4. यहाँ भी वह नदी — मंगलेश डबराल	12 Hours

Text Books

Sr. No	Title	Author	Publisher	Edition	Year of Edition
1	प्रयोजनमूलक हिंदी	डॉ. नरेश मिश्र	राजपाल एंड संस, नई दिल्ली	Latest	2022
2	आधुनिक हिंदी कविता	डॉ. नगेंद्र	राजकमल प्रकाशन, नई दिल्ली	Latest	2022
3	प्रयोजनमूलक हिंदी	डॉ. पूरनचंद टंडन	वाणी प्रकाशन, नई दिल्ली	Latest	2021
4	हिंदी साहित्य का इतिहास	आचार्य रामचंद्र शुक्ल	लोकभारती प्रकाशन, प्रयागराज	Latest	2021



Reference Books

Sr. No.	Title	Author	Publisher	Edition	Year of Edition
1	प्रयोजनमूलक हिंदी और कार्यालयी हिंदी	डॉ. हरिमोहन	तक्षशिला प्रकाशन, नई दिल्ली	Latest	2022
2	विज्ञापन और जनसंचार	डॉ. कृष्ण कुमार गोस्वामी	राधाकृष्ण प्रकाशन, नई दिल्ली	Latest	2021
3	हिंदी कविता : आधुनिक परिप्रेक्ष्य	डॉ. बच्चन सिंह	वाणी प्रकाशन, नई दिल्ली	Latest	2022
4	समकालीन हिंदी कविता	डॉ. नामवर सिंह	राजकमल प्रकाशन, नई दिल्ली	Latest	2021

E- Learning Resources

Sr No	Title	Course Instructor	Platform	Web link
1	Integrated Marketing Communication	Prof. Vinay Sharma	SWAYAM (NPTEL)	https://onlinecourses.nptel.ac.in/noc26_mg71/preview?utm_source=chatgpt.com
2	Visual Communication Design for Digital Media	Prof. Saptarshi Kolay	SWAYAM (NPTEL)	https://www.nptel.ac.in/courses/124107002?utm_source=chatgpt.com
3	e-PG Pathshala – Hindi Language and Literature	UGC Subject Experts	e-PG Pathshala	https://epgp.inflibnet.ac.in/?utm_source=chatgpt.com
4	DIKSHA – Hindi Language Learning Resources	NCERT / Education Experts	DIKSHA	https://diksha.gov.in/?utm_source=chatgpt.com

Suggested Field Work or Practical Work:

संबंधित अध्यापक हिंदी विषय के लिए छात्रों को अलग-अलग पाँच कार्यक्रमों के माध्यम से प्रायोगिक (Practical) कार्य पूर्ण कराएँ।

Sr.no	संदर्भ ग्रंथ सूची
1	प्रयोजनमूलक हिंदी — डॉ. लक्ष्मीकांत पांडेय
2	प्रयोजनमूलक हिंदी की प्रासंगिकता एवं परिदृश्य — डॉ. सु. नागलक्ष्मी
3	प्रयोजनमूलक हिंदी — डॉ. माधव सोनटक्के
4	प्रयोजनमूलक व्यावहारिक हिंदी — ओमप्रकाश मिश्र
5	विज्ञापन कला: कल, आज और कल — यशोदा भागवत (अनुवाद: डॉ. गोविंद गुंठे)
6	सूचना विज्ञान के बहुआयामी प्रभाव — डॉ. गोविंद गुंठे


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Class	B.C.A. Sem. –I
Lab Code and Lab Title	0UBCPC108 -C-Programming Lab
Prerequisite/s	-
Teaching Scheme: Lecture/Tutorial/Practical	0/0/4
Credits	02
Evaluation Scheme: ISE / ESE	20/30

Course Outcomes (COs)		Bloom's Level
Upon successful completion of this Lab, the student will be able to:		
0UBCPC109_1	Develop C programs using variables, data types, operators, input/output statements, and control structures to solve computational problems.	L3,L6
0UBCPC109_2	Implement solutions using decision-making statements, loops, functions, arrays, pointers, and strings for mathematical and logical problems.	L3,L6
0UBCPC109_3	Develop C programs using structures and file handling to organize, store, and retrieve data effectively.	L3,L6
0UBCPC109_4	Analyze, debug, test, and document C programs using modular programming practices and appropriate programming techniques.	L4,L6

List of Experiments:

Expt. No.	Title of Experiment
Students should prepare Algorithms and Flowcharts before implementing these programs in C.	
1.	Convert degrees Celsius to Fahrenheit and vice versa.
2.	Display three input numbers in sorted (non-decreasing) order.
3.	Given a positive integer value n (≥ 0) display number, square and cube of numbers from 1 to n in a tabular format?
4.	Given an input positive integer number, display odd numbers from in the range [1,n]?
5.	Display first mathematical tables, each table up to 10 rows? Generalize this to display first n (> 0) mathematical tables up to m ($m > 0$) rows?
6.	Display pattern programs.

Text Books

Sr. No	Title	Author	Publisher	Edition	Year of Edition
1	<i>Programming in ANSI C</i>	E. Balagurusamy	McGraw Hill Education	Eighth	2019
2	<i>The C Programming Language</i>	Brian W. Kernighan, Dennis M. Ritchie	Pearson Education	Second	1988
3	<i>Let Us C</i>	Yashavant P. Kanetkar	BPB Publications	Eighteenth	2020
4	<i>Programming with C</i>	Byron S. Gottfried	McGraw Hill Education	Third	2018



	Hollow square pattern: <pre>##### # # # # # # #####</pre>	Triangle Patterns with numbers: <pre> 1 121 12321 1234321 123454321</pre>	Square with diagonals: <pre> * * * * * * * * * * * * * * * * * * * * * * * </pre>	Diamond Pattern <pre> * *** ***** *** *</pre>
	<pre>\$ SS SS\$ SS\$\$ SS\$\$\$</pre>	<pre> \$ \$\$ \$\$\$ \$\$\$\$ \$\$\$\$\$</pre>	<pre>12345 1234 123 12 1</pre>	<pre>12345 1234 123 12 1</pre>
7.	Display the first n terms of Fibonacci and Tribonacci sequences.			
8.	Extract digits of an integer number (left to right and right to left).			
9.	Display a number in text form (e.g., 5432 → FIVE FOUR THREE TWO).			
10.	Check whether a given positive integer is a palindrome.			
11.	Compute character grade from the marks ($0 \leq \text{marks} \leq 100$) of a subject. Grading Scheme: 80-100 : A, 60 - 79: B, 50 - 59: C, 40-49: D, 0-39: F? Solve this using both else-if ladder and switch case?			
12.	Compute the sum of numbers using sentinel-controlled repetition.			
13.	Check whether a given positive integer is a prime number.			
14.	Compute the prime factors of a positive integer.			
15.	Check whether two positive integers are amicable numbers.			
16.	Check whether a given positive integer is a perfect number.			
17.	Check whether a given positive integer is an Armstrong number.			
18.	Read an array and compute mean (average), range, and mode.			
19.	Perform matrix addition, subtraction, and transpose.			
20.	Write a recursive program to count the number of digits of a positive integer number?			
21.	Write a recursive program to print numbers entered using sentinel-controlled repetition in reverse order.			
22.	Implement your own string length function and string reversal function.			
23.	Display Value and Address Using Pointer and Swap Two Numbers Using Pointers			
24.	Store and Display Student Information Using Structure			
25.	Demonstrate Different File Modes (r, w, a, r+, w+, a+)			



Reference Books:

Sr. No	Title	Author	Publisher	Edition	Year of Edition
1	<i>Problem Solving and Program Design in C</i>	Jeri R. Hanly, Elliot B. Koffman	Pearson	Eighth	2016
2	<i>C: How to Program</i>	Paul Deitel, Harvey Deitel	Pearson	Eighth	2016
3	<i>Programming in C</i>	Stephen G. Kochan	Pearson	Fourth	2015
4	<i>Schaum's Outline of Programming with C</i>	Byron S. Gottfried	McGraw Hill	Second	1996

E- Learning Resources

Sr. No	Title	Author	Publisher	Edition	Year of Edition
1	Programming in C	Prof. S. N. Sivanandam	NPTEL Videos	--	--
2	Introduction to Programming in C	Prof. Raghunath Tewari	NPTEL Videos	--	--
3	Problem Solving Through Programming in C	Prof. Anupam Basu	NPTEL Videos	--	--
4	Introduction to C Programming	SWAYAM Faculty	SWAYAM	--	--


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SEMESTER-II

Class	B.C.A. Sem. –II
Course Code and Course Title	0UBCPC201, Data Structures using C
Prerequisite/s	-
Teaching Scheme: Lecture/Tutorial/Practical	48/00/00
Credits	04
Evaluation Scheme: ISE / MSE / ESE	20/20/60

Course Outcomes (COs): Upon successful completion of this course, the student will be able to:		Bloom's Level
0UBCPC201_1	Explain fundamental concepts, classifications, operations, and complexity of various data structures.	L2
0UBCPC201_2	Apply appropriate data structures and algorithms for searching, sorting, recursion, and problem-solving.	L3
0UBCPC201_3	Implement stacks, queues, linked lists, hashing, trees, and graphs using C programming.	L3
0UBCPC201_4	Analyze and develop efficient solutions using appropriate data structures and algorithms considering time and space complexity.	L4,L6

Course Contents:		
Unit 1	Introduction and Overview: Definition, Classification and Operations of Data Structures. Algorithms: Complexity, Time-Space Trade-off. Arrays: Definition and Classification of Arrays, Representation of Linear Arrays in Memory, Operations (String Manipulation) on Linear Arrays: Traversing, Inserting, Deleting, Searching, Sorting and Merging. Two-Dimensional Arrays, Representation of Two- Dimensional Arrays in Memory, Matrices and Sparse Matrices, Multi-Dimensional Arrays. Searching: Linear Search and Binary Search Sorting: Bubble Sort, Selection Sort, Insertion Sort, Merge Sort	12 Hours
Unit 2	Stacks: Definition, Representation of Stacks using Arrays and Linked List, Operations on Stacks using Arrays and Linked List, Application of Stacks-Arithmetic Expressions, Polish Notation, Conversion of Infix Expression to Postfix Expression, Evaluation of Postfix Expression. Recursion: Definition, Recursive Notation, Runtime Stack, Applications of Recursion-Factorial of Number, GCD, Fibonacci Series and Towers of Hanoi. Queues: Definition, Representation of Queues using Array and Linked List, Types of Queue: Simple Queue, Circular Queue, Double-Ended queue, Priority Queue, Operations on Simple Queues and Circular Queues using Array and Linked List Applications of Queues	12 Hours



Unit 3	Linked Lists: Definition, Comparison with Arrays, Representation, Types of Linked lists, Traversing, Inserting, Deleting and Searching in Singly Linked List, Doubly Linked List and Circular Linked List. Applications of Linked Lists: Addition of Polynomials. Hashing and Collision: Hashing, Hash Tables, Types of Hash Functions, Collision, Collision Resolution with Open Addressing and Chaining.	12 Hours
Unit 4	Graphs: Definition, Terminology, Representation, Traversal. Trees: Definition, Terminology, Binary Trees, Traversal of Binary Tree, Binary Search Tree, Inserting, Deleting and Searching in Binary Search Tree, Height Balanced Trees - AVL Trees, Insertion and Deletion in AVL Tree.	12 Hours

Text Books

Sr. No	Title	Author	Publisher	Edition	Year of Edition
1	Expert Data Structures with C	R.B. Patel	Khanna Book Publishing Company	-	2023
2	Data Structures with C	Seymour Lipschutz	Tata McGraw-Hill Education Pvt. Ltd	1st	2011
3	Data Structures Through C	Yashavant P. Kanetkar	BPB Publications	4th	2022

Reference Books

Sr. No	Title	Author	Publisher	Edition	Year of Edition
1	Data Structures Using C	Reema Thareja	Oxford University Press	2nd	2014
2	Fundamentals of Data Structures in C	Ellis Horowitz, Sartaj Sahni, and Susan Anderson-Freed	Universities Press	2nd	2007

E- Learning Resources

Sr. No	Title	Course Instructor	Platform	Web link
1	Data Structures in C	Charles Russell Severance	Coursera	https://sllnk.com/eu38bme
2	Mastering Data Structures & Algorithms using C and C++	Abdul Bari	Udemy	https://llnq.com/278pc4c
3	Data Structures in C	Mr. Bharani Akella	Great Learning	https://sllnk.com/c4andwe

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Class	B.C.A. Sem. –II
Course Code and Course Title	0UBCPC202, Operating Systems
Prerequisite/s	-
Teaching Scheme: Lecture/Tutorial/Practical	24/00/00
Credits	02
Evaluation Scheme: ISE/ MSE / ESE	10/10/30

Course Outcomes (COs): Upon successful completion of this course, the student will be able to:		Bloom's Level
0UBCPC202_1	Explain the fundamentals of the operating system.	L2
0UBCPC202_2	Comprehend multithreaded programming, CPU scheduling, process management, process synchronization, memory, deadlocks, and storage management.	L2
0UBCPC202_3	Compare the performance of CPU scheduling algorithms	L4
0UBCPC202_4	Identify the features of I/O and File handling methods.	L1

Course Contents:		
Unit 1	Operating Systems Overview: Definition, Evaluation of O.S, Components & Services of OS, Structure, Architecture, types of Operating Systems, Batch Systems, Concepts of Multiprogramming and Time Sharing, Parallel, Distributed and real time Systems. Operating Systems Structures: Operating system services and systems calls, system programs, operating system structure, operating systems generations	06 Hours
Unit 2	Process Management: Process Definition, Process states, Process State transitions, Process Scheduling, Process Control Block, Threads, Concept of multithreads, Benefits of threads, Types of threads. Process Scheduling: Definition, Scheduling objectives, Scheduling algorithms, CPU scheduling Preemptive and Non-preemptive Scheduling algorithms (FCFS, SJF and RR), Performance evaluation of the scheduling Algorithms	06 Hours
Unit 3	Process Synchronization: Introduction, Inter-process Communication, Race Conditions, Critical Section Problem, Mutual Exclusion, Semaphores, Monitors. Deadlocks: System model, deadlock characterization, deadlock prevention, avoidance, Banker's algorithm, Deadlock detection, and recovery from deadlocks	06 Hours
Unit 4	Memory Management: Logical and Physical address map, Swapping, Memory allocation, MFT, MVT, Internal and External fragmentation and Compaction, Paging, Segmentation. Virtual Memory: Demand paging, Page Replacement algorithms, Allocation of frames, thrashing. I/O Management: Principles of I/O Hardware: Disk structure, Disk scheduling algorithms.	06 Hours



Text Books

Sr. No	Title	Author	Publisher	Edition	Year of Edition
1	Operating Systems Concepts	Ekta Walia	Khanna Publishing House	1st	2022
2	Operating System Concepts	Abraham Silberschatz, Peter Baer Galvin, Greg Gagne	Wiley India Pvt. Ltd.	10th	2018
3	Operating Systems: Internals and Design Principles	William Stallings	Pearson Education	9th	2018
4	Operating System	Harvey M. Deitel, Paul J. Deitel, David R. Choffnes	Pearson Education	3rd	2003

Reference Books

Sr. No.	Title	Author	Publisher	Edition	Year of Edition
1	Modern Operating Systems	Andrew S. Tanenbaum, Herbert Bos	Pearson Education.	4 th	2015
2	UNIX Concepts and Applications	Sumitabha Das	McGraw Hill Education	4 th	2006
3	Operating Systems: A Concept-Based Approach	D. M. Dhamdhare	McGraw Hill Education	3rd	2013
4	Operating System Principles	Naresh Chauhan	Oxford University Press	1 st	2014

E- Learning Resources

Sr. No.	Title	Course Instructor	Platform	Web link
1	Introduction to Operating Systems	Prof. Chester Rebeiro (IIT Madras)	NPTEL (SWAYAM)	https://nptel.ac.in/courses/106106144?
2	Operating System Fundamentals	Prof. Santanu Chattopadhyay (IIT Kharagpur)	NPTEL / SWAYAM (IIT Madras)	https://nptel.ac.in/courses/106105214?
3	Operating System Tutorial	GeeksforGeeks Editorial Team	GeeksforGeeks	https://www.geeksforgeeks.org/operating-systems/
4	Operating Systems	TutorialsPoint Editorial Team	TutorialsPoint	https://www.tutorialspoint.com/operating_system/index.htm

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Class	B.C.A. Sem. –II
Course Code and Course Title	0UBCPC203 Object Oriented Programming Using JAVA
Prerequisite/s	Knowledge of Problem Solving Techniques using C programming language
Teaching Scheme: Lecture/Tutorial/Practical	48/00/00
Credits	04
Evaluation Scheme: ISE / MSE / ESE	20/20/60

Course Outcomes (COs): Upon successful completion of this course, the student will be able to:		Bloom's Level
0UBCPC203_1	Explain the fundamental concepts of Object-Oriented Programming, Java evolution, Java features, Java environment, JVM, Java program structure, Java tokens, statements, command-line arguments, constants, variables, and data types.	L2
0UBCPC203_2	Apply Java operators, expressions, type conversion, classes, objects, constructors, methods, arrays, strings, vectors, wrapper classes, and enumerated types to develop Java programs using method overloading and method overriding.	L3
0UBCPC203_3	Analyze inheritance, interfaces, polymorphism, abstract classes, the super and final keywords, and runtime polymorphism to design reusable and maintainable object-oriented Java applications.	L4
0UBCPC203_4	Implement Java applications using multithreading, packages, and exception handling by implementing threads, creating user-defined packages, and handling exceptions effectively.	L3

Course Contents: Unit I: Introduction to Programming and C Fundamentals (7 Hours).		
Unit 1	Fundamentals of Object Oriented Programming: Basic Concepts of Object Oriented Programming (OOP), Benefits and Applications of OOP. Java Evolution: Java Features, Difference between Java, C and C++, Java and Internet, Java Environment. Overview of Java Language: Introduction to Simple Java Program, Use of Comments and Math function, Application of two classes, Java Program Structure, Java Tokens and statements, Implementing Java program And JVM, Command Line Arguments. Constants, Variables and Data Types: Constants, Variables, Data Types, Declaration of Variables, Giving values to Variables, Symbolic Constants, Typecasting.	12 Hours
Unit 2	Operators & Expressions: Arithmetic operators, Relational operators, Logical operators, Assignment operators, Increment & Decrement operators, conditional operators, Bitwise operators, Arithmetic Expressions, Evaluation of Expressions, Type Conversions in Expressions, Operator Precedence & Associativity. Classes, Objects and Methods: Defining Class, Methods Declaration, Constructors, Methods Overloading, Overriding Methods. Arrays, Strings and Vectors: 1D arrays, Creating an Array, 2D arrays, Strings, Vectors, Wrapper Classes, Enumerated Types	12 Hours
Unit 3	Inheritance: Inheritance Basics (extends keyword) and Types of Inheritance, Superclass, Subclass and use of super keyword, Use of final keyword related to variable, Use of Abstract Class and Abstract Methods.	12 Hours



	Interface: Defining and Implementing Interfaces, Runtime Polymorphism using Interface. Polymorphism: Polymorphism, Method Overloading (Compile-time Polymorphism), Method Overriding (Runtime Polymorphism), Runtime Polymorphism using Inheritance, Runtime Polymorphism using Interfaces.	
Unit 4	Multithreading: Introduction to Multithreading, Creating Threads using the Thread Class, Creating Threads by Implementing the Runnable Interface, Thread Life Cycle, Thread Priorities, Thread Methods (start(), run(), sleep(), join(), yield()), Multithreading Applications. Packages: Basics of packages, System packages, Creating and accessing packages, Creating user defined packages, Adding class to a package. Exception Handling: Using the main keywords of exception handling: try, catch, throw, throws and finally; Nested try, Multiple catch statements, Creating user defined exceptions	12 Hours

Text Books

Sr. No	Title	Author	Publisher	Edition	Year of Edition
1	Programming with JAVA: A Primer	E. Balaguruswamy	McGraw Hill Education	7th Edition	2023
2	Java: The Complete Reference	Herbert Schildt	McGraw Hill Education	12th Edition	2022

Reference Books

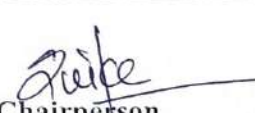
Sr. No.	Title	Author	Publisher	Edition	Year of Edition
1	The Essentials of JAVA	Arunesh Goyal	Khanna Book Publishing Company Private Limited	1st Edition	2012
2	Core JAVA	Tanweer Alam	Khanna Book Publishing Company Private Limited	1st Edition	2015
3	Introduction to Java Programming	Y. Daniel Liang	Pearson	7th Edition	2008
4	Programming in Java	S. Malhotra and S. Choudhary	Oxford University Press	2nd Edition	2014

E- Learning Resources

Sr. No.	Title	Course Instructor	Platform	Web link
1	Java Tutorial	W3Schools Team	W3Schools	https://www.w3schools.com/java/
2	Java Tutorials and Examples	Java2s Team	Java2s	http://www.java2s.com/
3	Programming in Java	NPTEL Faculty	NPTEL/SW AYAM	https://onlinecourses.nptel.ac.in/noc22_cs47/preview


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Class	B.C.A. Sem. –II
Course Code and Course Title	0UBCOE204 Mathematics Foundation to Computer Science-II
Prerequisite/s	Differentiation and Integration
Teaching Scheme: Lecture/Tutorial/Practical	24/00/00
Credits	02
Evaluation Scheme: ISE / MSE / ESE	10 /10 /30

Course Outcomes (COs): Upon successful completion of this course, the student will be able to:		Bloom's Level
0UBCOE1204_1	Analyze logical propositions, construct truth tables, and apply normal forms, equivalence laws, and formal inference rules to validate mathematical proofs	L4
0UBCOE1204_2	Examine algebraic sets to verify their properties as semigroups, monoids, groups, subgroups, or cyclic groups.	L4
0UBCOE1204_3	Apply numerical methods, error analysis, interpolation formulas, and numerical integration rules to solve linear, non-linear, and data-based mathematical problems.	L3
0UBCOE1204_4	Solve linear programming and transportation problems using graphical and optimization methods to find optimal solutions.	L3

Course Contents:		
Unit 1	Mathematical Logic Propositions, logical operations (basic connectives), compound statements, construction of truth table, quantifiers, conditional statements, tautology, contradiction, contingency, logical equivalence. Conjunctive Normal Forms (CNF) and Disjunctive Normal Forms (DNF). Methods of proofs: Rules of inference for propositional logic, syllogism, proof by contradiction.	06 Hours
Unit 2	Group Theory Definition of group, Semi-group, Monoid, Subgroup, Cyclic group and its examples	06 Hours
Unit 3	Numerical Methods Bisection Method, Regula-falsi Method, Newton-Raphson Method, Matrix Inversion Method, Gauss Elimination Method (Algorithm and problem solving of above mentioned methods) Floating Point Representation, Types and Sources of Errors, Newton-Gregory Forward and Backward Interpolation Formula, Lagrange's Interpolation formula for unequal Intervals, Trapezoidal rule, Simpson's $\frac{11}{33}$ rd rule, Simpson's $\frac{33}{88}$ th rule and examples	06 Hours
Unit 4	Optimization Techniques Linear programming: Introduction, LP formulation, Graphical method for solving LPs with two variables Transportation problem: Definition, Linear form, North-west corner method, Least-cost method, Vogel's approximation method for finding feasible solution, MODI method for finding optimum solution.	06 Hours



Text Books

Sr. No	Title	Author	Publisher	Edition	Year of Edition
1	Introductory Methods of Numerical Analysis	Shastry S. S	PHL	5 th	2022
2	Operations Research: An Introduction	Taha Hamdy A	Pearson Prentice Hall	8 th	2003
3	Discrete Structures	S.B. Singh	Khanna Book Publishing(AICTE Recommended book)	-	2023

Reference Books

Sr. No.	Title	Author	Publisher	Edition	Year of Edition
1	Discrete Mathematics and its Applications	Rosen Kenneth H. and Krithivasan Kamala	McGraw Hill, India	-	2019
2	Linear Programming and Game Theory	Chakravorty J. G. and Ghosh P. R.	Moulik Library	-	2017
3	Operations Research: Theory and Applications	Sharma J. K	Macmillan Publishers	4 th	2007
4.	Numerical Methods	E.Balaguruswamy.	Tata McGraw Hill Publication	-	-

E- Learning Resources

Sr. No.	Title	Course Instructor	Platform	Web link
1	Higher Engineering Mathematics	Prof. P.N.Agrwal IIT Roorkee	NPTEL	https://nptel.ac.in/courses/111107127
2	Introduction to Numerical Analysis	S.Baskar and S.Sivaji Ganesh IIT Bombay	Lecture Notes	https://www.math.iitb.ac.in/~siva/si50716/S1507lecturenotes.pdf


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Class	B.C.A. Sem.-II
Course Code and Course Title	0UBCVS205, WEB TECHNOLOGIES
Prerequisite/s	1) Proficiency in at least one programming language, such as Python, Java, or C. Understanding of programming concepts such as loops, conditionals, functions, and data structures like arrays, lists. 2) Familiarity with object-oriented programming (OOP) principles, including classes, objects, inheritance, and polymorphism.
Teaching Scheme: Lecture/Tutorial/Practical	24/00/00
Credits	02
Evaluation Scheme: ISE / MSE / ESE	10/10/30

Course Outcomes (COs): Upon successful completion of this course, the student will be able to:		Bloom's Level
0UBCVS205_1	Explain the fundamental concepts of Internet, World Wide Web, web architecture, HTML, and Cascading Style Sheets (CSS).	L2
0UBCVS205_2	Apply HTML and CSS concepts to design structured, responsive, and user-friendly web pages and forms.	L3
0UBCVS205_3	Implement JavaScript concepts such as functions, events, DOM manipulation, and form validation to develop interactive web pages.	L3
0UBCVS205_4	Develop interactive web applications using HTML, CSS, JavaScript, XML, XSLT, and AJAX technologies.	L6

Course Contents:		
Unit I	Fundamentals of Web Architecture and HTML: Introduction to Internet and WWW, Web Protocols, Web Development Tools, Web Browsers, DNS, Web Servers, Client-Server Architecture, Web Hosting and Types of Web Hosting. Introduction to HTML, History and Objectives of HTML, Basic Structure of HTML, Head and Body Tags, Heading, Paragraph, Anchor and List Tags.	6 Hours
Unit II	HTML Forms and CSS: HTML Forms, Tables, Form and Input Controls, Textarea, Select, Image, IFrame, Fieldset, DIV Tag, Navigation Bar Design. Introduction to CSS, Inline, Internal and External CSS, CSS Selectors, Responsive Web Page Design.	6 Hours
Unit III	JavaScript Programming: Introduction to JavaScript, Variables, Arrays, Output Methods, Functions, Events, Document Object Model (DOM), Date and String Handling, Manipulating CSS using JavaScript, Form Validation using Required Field, Length and Regular Expression-based Pattern Validation. Integration of HTML, CSS and JavaScript.	6 Hours
Unit IV	XML and AJAX: Introduction to XML, Uses and Key Concepts, DTD, XML Schemas, XSL, XSLT and XSL Elements, XML Transformation using XSLT. Introduction to AJAX, Purpose, Advantages and Disadvantages, AJAX-based Web Applications and Real-world Applications.	6 Hours



Text Books:

Sr. No	Title	Author	Publisher	Edition	Year of Edition
1	Mastering HTML, CSS & JavaScript Web Publishing	Laura Lemay	BPB Publications	1st Edition	2016
2	HTML & CSS: The Complete Reference	Thomas A. Powell	McGraw-Hill Education	5th Edition	2017
3	Murach's JavaScript and jQuery	Mary Delamater & Joel Murach	Mike Murach & Associates	4th Edition	2023
4	Modern Full-Stack Development	Frank W. Zammetti	Apress	2nd Edition	2024

Reference Books:

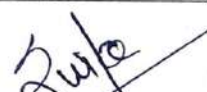
Sr. No	Title	Author	Publisher	Edition	Year of Edition
1	Web Technologies	Tanweer Alam	Khanna Book Publishing	1st Edition	2011
2	HTML 5 Black Book: Covers CSS3, JavaScript, XML, XHTML, AJAX, PHP and jQuery	DT Editorial Services	DreamTech Press	2nd Edition	2016
3	Web Programming: Building Internet Applications	Chris Bates	Wiley India	3rd Edition	2022
4	Learning Web Design: A Beginner's Guide to HTML, CSS, JavaScript, and Web Graphics	Jennifer Robbins	O'Reilly Media	6th Edition	2024
5	Web Technologies: HTML, CSS, JavaScript, PHP, Java, JSP, XML and AJAX	Uttam K. Roy	Oxford University Press	2nd Edition	2022

E- Learning Resources:

Sr. No.	Title	Course Instructor	Platform	Web link
1	Web Technologies Tutorial	Self-Paced (No Specific Instructor)	Javatpoint	https://www.javatpoint.com?utm_source=chatgpt.com
2	HTML, CSS, JavaScript and Web Development Tutorials	Self-Paced (No Specific Instructor)	W3Schools	https://www.geeksforgeeks.org/web-technology/?utm_source=chatgpt.com
3	Web Technology Tutorials	GeeksforGeeks Team	GeeksforGeeks	https://www.geeksforgeeks.org/web-technology/?utm_source=chatgpt.com


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Class	B.C.A. Sem. –II
Course Code and Course Title	0UBCHM206, Indian Constitution
Prerequisite/s	-
Teaching Scheme: Lecture/Tutorial/Practical	24/00/00
Credits	02
Evaluation Scheme: ISE / MSE / ESE	10/10/30

Course Outcomes (COs): Upon successful completion of this course, the student will be able to:		Bloom's Level
0UBCHM206_1	Explain the constitutional framework of India and its relevance to economic governance, business, and social justice.	L2
0UBCHM206_2	Analyze the impact of Fundamental Rights, Fundamental Duties, and constitutional provisions on business and economic activities.	L4
0UBCHM206_3	Analyze the principles of fiscal federalism, trade, commerce, and financial relations between the Centre and States in India.	L4
0UBCHM206_4	Evaluate constitutional issues and judicial decisions affecting contemporary economic and business matters through relevant case studies.	L5

Course Contents:		
Unit 1	An Economic History of the Constitution of India Historical understanding of the constitution as an economic document. Understanding the Preamble, starting from the land reform cases in the 1950s to the validity of the bitcoin ban imposed by the RBI, this module signpost all of the important economic moments in the constitutional history of post-colonial India; Constitutional design, Legal Regulation and economic justice	06 Hours
Unit 2	Fundamental Rights and Business in India Article 19(1)(g) grants every citizen the right, to practise any profession, or to carry on any profession, occupation, trade, or business. Like other fundamental rights, this right is subject to reasonable restrictions impose by the state. This particular provision of the Constitution has been one of the most severely litigated freedoms. Fundamental Duties.	06 Hours
Unit 3	Fiscal Federalism Article articles 301 to 307 of the Constitution pertains to Trade, Commerce and Intercourse within the Territory of India; Challenges associated with fiscal federalism in India including the vertical fiscal imbalance; Article 280 of the Constitution.	06 Hours
Unit 4	Constitutional battles that shaped the economy This module will be taught through key case studies that demonstrate the complex and fascinating overlap between the constitution and business and shall use Saurabh Kirpal's book Fifteen Judgments: Cases that Shaped India's Financial Unit: IV Landscape as our guide through this landscape. The case studies include the banning of diesel engine cars, Telecom regulation and ownership of broadcast media, Demonetisation, Aadhaar, the lifting of restrictions on dealing in cryptocurrencies.	06 Hours

Text Books

Sr. No	Title	Author	Publisher	Edition	Year of Edition
1	The Oxford Handbook of the Indian Constitution	Suprit Choudhary Madhav Khosla and Ankur K. Chaudhary	Oxford University Press	1st Edition	2016



		Pratap Bhanu Mehta			
2	Fifteen Judgments: Cases that Shaped India's Financial Landscape	Saurabh Kirpal	Penguin Random House India	1st Edition	2018
3	Introduction to the Constitution of India	Durga Das Basu	LexisNexis Butterworths Wadhwa	23rd Edition	2021
4	Constitutional Law of India	Dr. J. N. Pandey	Central Law Agency	61st Edition	2024
5	Indian Economy	Ramesh Singh	McGraw Hill Education	17th Edition	2025

Reference Books

Sr. No.	Title	Author	Publisher	Edition	Year of Edition
1	The Oxford Handbook of the Indian Constitution	Sujit Choudhry, Madhav Khosla & Pratap Bhanu Mehta (Editors)	Oxford University Press	1st Edition	2016
2	Fifteen Judgments: Cases that Shaped India's Financial Landscape	Saurabh Kirpa	Penguin Random House India	1st Edition	2018
3	Introduction to the Constitution of India	Durga Das Basu	LexisNexis Butterworths Wadhwa	23rd Edition	2021
4	Constitutional Law of India	Dr. J. N. Pandey	Central Law Agency	61st Edition	2024

E- Learning Resources

Sr. No.	Title	Course Instructor	Platform	Web link
1	Constitutional Studies	Prof. Faizan Mustafa	SWAYAM	https://onlinecourses.swayam2.ac.in
2	Constitutional Law	Prof. Faizan Mustafa	NPTEL	https://nptel.ac.in
3	Indian Constitution	Faculty of Law	e-PG Pathshala	https://epgp.inflibnet.ac.in
4	Indian Economy	Prof. D. N. Dwivedi	NPTEL	https://nptel.ac.in


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Class	B.C.A. Sem. –II
Course Code and Course Title	0UBCPC207, Data Structures Lab
Prerequisite/s	–
Teaching Scheme: Lecture/Tutorial/Practical	00/00/04
Credits	02
Evaluation Scheme: ISE / MSE / ESE	20/30

Course Outcomes (COs): Upon successful completion of this course, the student will be able to:		Bloom's Level
0UBCPC201_1	Explain fundamental concepts, classifications, operations, and complexity of various data structures.	L2
0UBCPC201_2	Apply appropriate data structures and algorithms for searching, sorting, recursion, and problem-solving.	L3
0UBCPC201_3	Implement stacks, queues, linked lists, hashing, trees, and graphs using C programming.	L3
0UBCPC201_4	Analyze and develop efficient solutions using appropriate data structures and algorithms considering time and space complexity.	L4,L6

List of Experiments:

Expt. No.	Title of Experiment
1	Write a program for string manipulation operations in an array.
2	Write a program to search for an element in an array using Linear and Binary Search.
3	Write a program to sort an array using Bubble Sort, Selection Sort, Insertion Sort, merge sort.
4	Write a program to add, subtract and multiply two matrices.
5	Write a program to perform different operations on a Singly Linked List.
6	Write a program to perform different operations on Doubly Linked List.
7	Write a program to perform different operations on Circular Linked List.
8	Write a program to implement stack operations using an array & linked list.
9	Write a program to evaluate an expression in another form using a stack.
10	Write a program to perform the following using recursion: a) Find the factorial of a number. b) Find the GCD of two numbers. c) Solve the Towers of Hanoi problem.
11	Write a program to implement simple queue operations using an array & linked list.



12	Write a program to implement circular queue operations using an array & linked list.
13	Write a program to add two polynomials using a linked list.
14	Write a program to perform the following operations on a binary search tree. (a) Preorder Traversal (b) Inorder Traversal (c) Postorder Traversal
15	Write a program to perform insertion operations in a binary search tree.

Text Books

Sr. No	Title	Author	Publisher	Edition	Year of Edition
1	Expert Data Structures with C	R.B. Patel	Khanna Book Publishing Company		2023
2	Data Structures with C	Seymour Lipschutz	Tata McGraw-Hill Education Pvt. Ltd	1st	2011
3	Data Structures Through C	Yashavant P. Kanetkar	BPB Publications	4th	2022

Reference Books

Sr. No.	Title	Author	Publisher	Edition	Year of Edition
1	Data Structures Using C	Reema Thareja	Oxford University Press	2nd	2014
2	Fundamentals of Data Structures in C	Ellis Horowitz, Sartaj Sahni, and Susan Anderson-Freed	Universities Press	2nd	2007

E- Learning Resources

Sr. No	Title	Course Instructor	Platform	Web link
1	Data Structures in C	Charles Russell Severance	Coursera	https://sllnk.com/eu38bme
2	Mastering Data Structures & Algorithms using C and C++	Abdul Bari	Udemy	https://l1nq.com/278pc4c
3	Data Structures in C	Mr. Bharani Akella	Great Learning	https://sllnk.com/c4andwe


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Class	B.C.A. Sem. –II
Lab Code and Lab Title	0UBCPC208 -Core JAVA Lab
Prerequisite/s	-
Teaching Scheme: Lecture/Tutorial/Practical	00/00/04
Credits	02
Evaluation Scheme: ISE / ESE	20/30

Course Outcomes (COs)		Bloom's Level
Upon successful completion of this Lab, the student will be able to:		
0UBCPC1208_1	Apply Java programming concepts such as variables, data types, operators, input/output, command-line arguments, and control structures to solve computational problems.	L3
0UBCPC1208_2	Implement solutions using decision-making, loops, methods, recursion, arrays, strings, and matrices for mathematical and logical problems.	L3, L6
0UBCPC1208_3	Develop Java applications using object-oriented concepts such as classes, objects, inheritance, method overriding, interfaces, and polymorphism.	L6
0UBCPC1208_4	Analyze, debug, test, and develop modular Java programs using appropriate programming practices and object-oriented design principles.	L4, L6

List of Experiments:

Expt. No.	Title of Experiment
Students should prepare Algorithms and Flowcharts before implementing these programs in C.	
1.	Write a program to read two numbers from user and print their product.
2.	Write a program to print the square of a number passed through command line arguments.
3.	Write a program to send the name and surname of a student through command line arguments and print a welcome message for the student.
4.	Write a Java program to find the largest number out of n natural numbers.
5.	Write a Java program to find the Fibonacci series & Factorial of a number using recursive and non-recursive functions.
6.	Write a Java program to multiply two given matrices.
7.	Write a Java program for sorting a given list of names in ascending order.
8.	Write a Java program that checks whether a given string is a palindrome or not. Ex: MADAM is a palindrome.
9.	Write a Java program to read n number of values in an array and display it in reverse order.
10.	Write a Java program to perform mathematical operations. Create a class called AddSub with methods to add and subtract. Create another class called MulDiv that extends AddSub class to use the member data of the super class. MulDiv should have methods to multiply and divide. A



	main function should access the methods and perform the mathematical operations.
11.	Create a JAVA class called Student with the following details as variables within it: USN, NAME, BRANCH, PHONE, PERCENTAGE. Write a JAVA program to create n Student objects and print the USN, Name, Branch, Phone, and Percentage of these objects with suitable headings.
12.	Write a Java program that displays the number of characters, lines and words in a text.
13.	Write a Java program to create a class called Shape with methods called getPerimeter() and getArea(). Create a subclass called Circle that overrides the getPerimeter() and getArea() methods to calculate the area and perimeter of a circle.
14.	Write a Java program to create a class Employee with a method called calculateSalary(). Create two subclasses Manager and Programmer. In each subclass, override the calculateSalary() method to calculate and return the salary based on their specific roles.
15.	Write a Java program using an interface called Bank having function rate_of_interest(). Implement this interface to create two separate bank classes SBI and PNB to print different rates of interest. Include additional member variables and constructors also in classes SBI and PNB.

Text Books

Sr. No	Title	Author	Publisher	Edition	Year of Edition
1	Java: The Complete Reference	Herbert Schildt	McGraw Hill Education	Twelfth	2021
2	Core Java, Volume I – Fundamentals	Cay S. Horstmann	Pearson Education	Twelfth	2022
3	Head First Java	Kathy Sierra, Bert Bates, Trisha Gee	O'Reilly Media	Third	2022
4	Introduction to Java Programming and Data Structures	Y. Daniel Liang	Pearson Education	Twelfth	2019

Reference Books:

Sr. No	Title	Author	Publisher	Edition	Year of Edition
1	Core Java, Volume I – Fundamentals	Cay S. Horstmann	Pearson	Twelfth	2022
2	Java: The Complete Reference	Herbert Schildt	McGraw Hill	Twelfth	2021



3	Java How to Program	Paul Deitel, Harvey Deitel	Pearson	Eleventh	2018
4	Beginning Programming with Java For Dummies	Barry Burd	Wiley	Seventh	2020

E- Learning Resources

Sr. No	Title	Author	Publisher	Edition	Year of Edition
1	Programming in Java	Prof. Debasis Samanta	NPTEL Videos	--	--
2	Introduction to Java Programming	Prof. S. N. Sivanandam	NPTEL Videos	--	--
3	Programming in Java	Prof. Kannan Moudgalya	NPTEL Videos	--	--
4	Programming in Java	SWAYAM Faculty	SWAYAM	--	--


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Class	B.C.A. Sem. –II
Lab Code and Lab Title	0UBCVS209, Web Technologies Lab
Prerequisite/s	1) Proficiency in at least one programming language, such as Python, Java, or C. Understanding of programming concepts such as loops, conditionals, functions, and data structures like arrays, lists. 2) Familiarity with object-oriented programming (OOP) principles, including classes, objects, inheritance, and polymorphism.
Teaching Scheme: Lecture/Tutorial/Practical	00/00/04
Credits	02
Evaluation Scheme: ISE / ESE	20/30

Course Outcomes (COs) Upon successful completion of this Lab, the student will be able to:		Bloom's Level
0UBCVS209_1	To understand the concepts and architecture of the World Wide Web, Markup languages along with Cascading Style Sheets.	L2
0UBCVS209_2	To understand the concepts of event handling and data validation mechanisms.	L2
0UBCVS209_3	To understand the concepts of embedded dynamic scripting on client side programming.	L2
0UBCVS209_4	To develop modern interactive web applications	L3

List of Experiments:

Expt. No.	Title of Experiment
1	Create a Personal Resume using HTML headings, paragraphs, lists, images, and hyperlinks.
2	Design a Class Time Table using HTML Table with Rowspan and Colspan.
3	Develop a College Webpage containing About College, Departments, Courses, Faculty, Library, and Contact Information using HTML and Navigation Links.
4	Create a Student Admission Form using HTML Form Controls such as Textbox, Password, Radio Button, Checkbox, Select, Textarea, and Submit Button.
5	Design a Responsive College Homepage using Inline, Internal, and External CSS.
6	Create a Navigation Bar (Navbar) using HTML and CSS with Hover Effects.
7	Create a Photo Gallery Webpage using CSS, DIV, and Images.
8	Develop a JavaScript program to perform Arithmetic Operations using Switch Case.
9	Create a Webpage demonstrating five JavaScript Events (onclick, ondblclick, onmouseover, onmouseout, onchange).
10	Develop a Simple Calculator using JavaScript Functions for Addition, Subtraction, Multiplication, and Division.
11	Create a Student Information Form with JavaScript Validation for Required Fields, Mobile Number, Email, Password Length, and Date of Birth.
12	Design a Login Page using HTML, CSS, and JavaScript with Username and Password Validation using Regular Expressions.
13	Create an XML Document for Student Information and validate it using DTD and XML Schema (XSD).
14	Create an XSLT Stylesheet to Transform Student XML Data into an XHTML Table.
15	Develop an AJAX Program to Read Student Details or Current Date from a Text/XML File without Reloading the Webpage.



Text Books:

Sr. No	Title	Author	Publisher	Edition	Year of Edition
1	Mastering HTML, CSS & JavaScript Web Publishing	Laura Lemay	BPB Publications	1st Edition	2016
2	HTML & CSS: The Complete Reference	Thomas A. Powell	McGraw-Hill Education	5th Edition	2017
3	Murach's JavaScript and jQuery	Mary Delamater & Joel Murach	Mike Murach & Associates	4th Edition	2023
4	Modern Full-Stack Development	Frank W. Zammetti	Apress	2nd Edition	2024

Reference Books:

Sr. No	Title	Author	Publisher	Edition	Year of Edition
1	Web Technologies	Tanweer Alam	Khanna Book Publishing	1st Edition	2011
2	HTML 5 Black Book: Covers CSS3, JavaScript, XML, XHTML, AJAX, PHP and jQuery	DT Editorial Services	DreamTech Press	2nd Edition	2016
3	Web Programming: Building Internet Applications	Chris Bates	Wiley India	3rd Edition	2022
4	Learning Web Design: A Beginner's Guide to HTML, CSS, JavaScript, and Web Graphics	Jennifer Robbins	O'Reilly Media	6th Edition	2024
5	Web Technologies: HTML, CSS, JavaScript, PHP, Java, JSP, XML and AJAX	Uttam K. Roy	Oxford University Press	2nd Edition	2022

E- Learning Resources:

Sr. No	Title	Course Instructor	Platform	Web link
1	Web Technologies Tutorial	Self-Paced (No Specific Instructor)	Javatpoint	https://www.javatpoint.com?utm_source=chatgpt.com
2	HTML, CSS, JavaScript and Web Development Tutorials	Self-Paced (No Specific Instructor)	W3Schools	https://www.geeksforgeeks.org/web-technology/?utm_source=chatgpt.com
3	Web Technology Tutorials	GeeksforGeeks Team	GeeksforGeeks	https://www.geeksforgeeks.org/web-technology/?utm_source=chatgpt.com

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Course Code	Course Title	L	T	P	Credit	Theory			Practical	
VAC201.1	Yoga and Physical fitness	0	0	2	1	ISE	ESE	Total	Int	Uni
						20	30	50	--	--
Course Outcomes (COs):	CO1: Gain a comprehensive understanding of yoga and its modern applications for holistic well-being. CO2: Demonstrate proficiency in yogic anatomy and physiology, enhancing yoga practice and promoting physical and energetic balance. CO3: Master the Eight Limbs of Yoga and comprehend their psychological impact, fostering personal growth and self-realization. CO4: Integrate yoga principles into sports and physical fitness activities to enhance performance and prevent injuries. CO5: Develop skills in wellness management and nutrition.									
Note	All the theoretical contents shall be delivered through the practical workshop mode only. No class room teaching is encouraged in this course.									Hours
UNIT I	• Yoga: Meaning and definition • Importance of yoga in 21st century • Introduction to Yogic Anatomy and Physiology • Yoga & sports, Yoga for healthy lifestyle • Types of Yoga: - Hatha yoga, laya yoga, mantra yoga, bhakti yoga, karma yoga, jnana yoga, raj yoga • Study of Chakras, Koshas, Pranas, Nadis, Gunas, Vayus and its application in Yogic practices. • Ashtang Yoga: - Yama, niyama, asana, pranayama, Pratyahar, dharna, dhyana, Samadhi: Benefits, Utilities & their psychological impact on body and mind. According to yoga concept of normality in modern psychology, concept of personality & its development, yogic management of psycho-somatic ailments: frustration, anxiety, depression									
UNIT II	• Sports for Physical Fitness: Meaning and definition • Physical Activity – Concept, Benefits of Participation in Physical Activities • Components and Significance of Physical Fitness -Health, Skill and Cosmetic Fitness • Types of Physical Activities – Walking, Jogging, Running, Calisthenics, Rope Skipping, Cycling, Swimming, Circuit Training, Weight training, Adventure Sports • Principles of Physical Fitness, Warming Up, Conditioning, Cooling Down, Methods to Develop and Measure Health and Skill related components of Physical Fitness • Measurement of Health Related Physical Fitness (HRPF)									
UNIT III	• Physical Wellness: Concept, Components • Types of wellness: psychological, social, emotional, and spiritual. • Significance with reference to Positive Lifestyle 2.2 • Concepts of Quality of Life and Body Image • Factors affecting Wellness • Wellness Programmes									
UNIT IV	• Concept of Nutrients, Nutrition, Balanced Diet, Dietary Aids and Gimmicks • Energy and Activity- Calorie Intake, Energy Balance Equation									
	• Obesity - Concept, Causes, Obesity Related Health Problems • Weight Management through Behavioural Modifications									



TextBooks/ Reference Books	• Anand O P. Yog Dawra Kaya Kalp. Sewasth Sahitya Perkashan. Kanpur. • Brown, J.E. Nutrition Now Thomson-Wadsworth. • Corbin et.al.Fitness & Wellness-Concepts. McGraw Hill. Publishers. New York.U.S.A • Corbin, C. B., G. J. Welk, W. R Corbin, K. A. Welk, Concepts of Physical Fitness: Active Lifestyle for Wellness. McGraw Hill, New York, USA. • Hoeger, W W K and S.A. Hoeger. Principles and Labs for Fitness and Wellness, Thomson Wadsworth, California, USA. • Hoeger, W.W. & S. Hoeger Fitness and Wellness. 7th Ed. Thomson Wadsworth, Boston, USA. • Kamlesh, M. L. & Singh, M. K.) Physical Education (Naveen Publications). • Kansal, D.K. Text book of Applied Measurement, Evaluation & Sports Selection. Sports & Spiritual Science Publications, New Delhi. • Kumari, Sheela, S., Rana, Amita, and Kaushik, Seema,, Fitness, Aerobics and Gym Operations, Khel Sahitya, New Delhi • Lumpkin, A. Introduction to Physical Education, Exercise Science and Sports Studies, McGraw Hill, New York, U.S.A. • Sarin N) Yoga Dawara Rogon Ka Upchhar.Khel Sahitya Kendra • Savard, M. and C. Svec The Body Shape Solution to Weight Loss and Wellness: The Apples & Pears Approach to Losing Weight, Living Longer, and Feeling Healthier. Atria Books, Sydney, Australia. • Siedentop, D. Introduction to Physical Education, Fitness and Sport, McGraw Hill Companies Inc., New York, USA. • Sri Swami Ramas. Breathing. Sadhana Mandir Trust.Rishikesh. • Swami Ram Yoga & Married Life Sadhana Mandir Trust. Rishikesh
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Course Code	Course Title	L	T	P	Credit	Theory			Practical	
						Int	Uni	Total	Int	Uni
VAC201.2	Sports	0	0	2	1	20	30	50	--	--
Course Outcomes (COs):	CO1: Understand the fundamental principles and concepts of sports management, including its scope, organizational structure, and ethical considerations. CO2: Analyse the role of marketing and sponsorship in the sports industry, with a focus on branding, target audience segmentation, and event management. CO3: Develop proficiency in financial management techniques specific to the sports industry, including revenue generation, cost management, and investment strategies. CO4: Explore the application of analytics and technology in sports, including performance evaluation, strategic decision-making, and fan engagement. CO5: Apply theoretical knowledge to practical scenarios through case studies and projects, fostering critical thinking and problem-solving skills in sports management contexts.									
Note	All the theoretical contents shall be delivered through the practical workshop mode only. No class room teaching is encouraged in this course.									Hours
UNIT I	Introduction to Sports Management • Definition and scope of sports management • Significance of sports management in society and its evolution over time • Organizational structure of sports: amateur, professional, and non-profit entities • Roles and responsibilities of key personnel: managers, coaches, and agents • Governance bodies in sports: FIFA, IOC, and NCAA • Legal issues: contracts, negotiations, intellectual property rights • Ethical considerations: fair play and doping									
UNIT II	Sports Marketing and Sponsorship • Unique aspects of sports marketing • Fan engagement strategies • Target audience identification and segmentation • Branding strategies for sports teams and athletes • Sponsorship and endorsement deals • Negotiating and managing partnerships • Event management: planning, organizing, and promoting sports events									
UNIT III	Financial Management in Sports • Revenue generation in sports: ticket sales, broadcasting rights, merchandise sales • Financial models: budgeting and forecasting • Cost management: player salaries, facility expenses, operational costs • Investment opportunities in sports • Risk management techniques specific to sports organizations									
UNIT IV	Sports Analytics and Technology • Introduction to sports analytics • Evaluating player performance • Devising game strategies • Fan engagement through technology • Analytical techniques: statistical analysis, data visualization, predictive modeling									



	• Key performance indicators (KPIs) in sports • Applications of analytics: talent scouting, injury prevention, performance optimization.	
extBooks/ Reference Books	1. Pedersen, P. M., Thibault, L., & Pedersen, P. M. (2019). Contemporary Sport Management. Human Kinetics. 2. Hoye, R., Smith, A. C. T., Nicholson, M., et al. (2021). Sports Management: Principles and Applications. Routledge. 3. Chelladurai, P., & Kerwin, S. (2017). Introduction to Sport Management: Theory and Practice. Human Kinetics. 4. Hoye, R., Cuskelly, G., & Nicholson, M. (2019). Sports Governance: A Guide for Sport Organizations. Routledge. 5. Conrad, M. (2018). The Business of Sports: A Primer for Journalists. Routledge. 6. Shank, M. D. (2019). Sports Marketing: A Strategic Perspective. Pearson. 7. Collett, P., & Fenton, W. (2019). The Sponsorship Handbook: Essential Tools, Tips and Techniques for Sponsors and Sponsorship Seekers. Kogan Page. 8. Fullerton, S. Jr., & Funk, D. C. (2019). Sports Marketing: A Practical Approach. Routledge. 9. Conrad, M. (2019). Winning in Sports Business: Essential Marketing, Finance, and Management Strategies. Routledge. 10. McCarty, L. A., & McPherson, G. (2019). Sports Event Management: The Caribbean Experience. Routledge. 11. Brown, M. T., Rascher, D., & Leeds, M. A. (2017). Financial Management in the Sport Industry. Routledge. 12. Winfree, J. A., & Rosentraub, M. S. (2017). Sports Finance and Management: Real Estate, Entertainment, and the Remaking of the Business. Taylor & Francis. 13. Foster, G., O'Reilly, N., & Cuskelly, G. (2018). Sports Business Management: Decision Making Around the Globe. Routledge. 14. Brown, M. T., & Shick, D. M. (2019). Financial Management in the Sport Industry. Routledge. 15. Conrad, M. (2018). The Business of Sports: A Primer for Journalists. Routledge. 16. Alamar, B. C. (2013). Sports Analytics: A Guide for Coaches, Managers, and Other Decision Makers. Columbia University Press. 17. Miller, T. W. (2019). Sports Analytics and Data Science: Winning the Game with Methods and Models. FT Press. 18. Marchi, M., Albert, J., & Baumer, B. (2014). Analyzing Baseball Data with R. Chapman and Hall/CRC. 19. Schumaker, R. P., Hwang, R. S. Y., & Chen, H. (2016). Sports Data Mining. Routledge. 20. Alamar, B. C. (2013). Sports Analytics: A Guide for Coaches, Managers, and Other Decision Makers. Columbia University Press.	


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Course Code	Course Title	L	T	P	Credit	Theory			Practical
VAC201.4	NSS	0	0	2	1	Int	Uni	Total	Int
						20	30	50	--
Course Outcomes (COs):	CO1: To provide students with an understanding of the history, philosophy, and basic concepts of the National Service Scheme (NSS). CO2: To familiarize students with the aims, objectives, and organizational structure of NSS. CO3: To equip students with knowledge about NSS programmes, activities, and their relevance. CO4: To develop an understanding of community mobilization techniques and their importance in NSS activities. CO5: To cultivate an appreciation for volunteerism, shramdan (voluntary labor), and their role in community development initiatives.								
Note	All the theoretical contents shall be delivered through the practical workshop mode only. No class room teaching is encouraged in this course.								
UNIT I	Introduction and Basic Concepts of NSS National Service Scheme (NSS) - history, philosophy, and fundamental concepts, aims and objectives, providing clarity on the organization's overarching goals. Symbols of NSS - Emblem, flag, motto, song, and badge; Organizational structure of NSS								
UNIT II	NSS Programmes and Activities Diverse programmes and activities conducted under the aegis of the National Service Scheme (NSS); Significance of commemorating important days recognized by the United Nations, Centre, State Government, and University; Examination of the methodology for adopting villages/slums and conducting surveys; Financial patterns of the NSS scheme								
UNIT III	Community Mobilization Dynamics of community mobilization within the framework of the National Service Scheme (NSS); Functioning of community stakeholders; The conceptual lens of community development.								
UNIT IV	Volunteerism and Shramdan in the Indian Context: Roles and Motivations within the NSS Framework Ethos of volunteerism and shramdan (voluntary labor) within the cultural context of India and the framework of the National Service Scheme (NSS); Motivations and constraints shaping volunteer engagement; Role of NSS volunteers in initiatives such as the Swachh Bharat Abhiyan and Digital India								



TextBooks/ Reference Books	1. Ministry of Youth Affairs and Sports, Government of India. (2022). National Service Scheme (NSS) Manual. 2. Agarwalla, S. (2021). NSS and Youth Development. Mahaveer Publications 3. Bhattacharya, P. (2024). Stories Of NSS (English Version). Sahityasree. 4. Borah, R. and Borkakoty, B. (2022). NSS in Socioeconomic Development. Unika Prakashan. 5. Wondimu, H., & Admas, G. (2024). The motivation and engagement of student volunteers in volunteerism at the University of Gondar. <i>Discover Global Society</i>, 2(1), 1-16. 6. Saha, A. K. (2002). Extension Education–The Third Dimension Needs and Aspirations of Indian Youth. <i>Journal of Social Sciences</i>, 6(3), 209-214. 7. Mills, S. (2013). “An instruction in good citizenship”: scouting and the historical geographies of citizenship education. <i>Transactions of the Institute of British Geographers</i>, 38(1), 120–134. http://www.jstor.org/stable/24582445 8. Mishra, S. K., Sachdev, S., Marwaha, N., & Avasthi, A. (2016). Study of knowledge and attitude among college-going students toward voluntary blood donation from north India. <i>Journal of blood medicine</i>, 19-26. 9. Mukherji, B. (2007). Community Development in India. Orient Longmans. 10. History Background of NSS and its Philosophy, Aims and Objectives 11. https://www.osmania.ac.in/NSS%20URL/9.%20%20Historical%20Background%20of%20NSS%20and%20its%20Philosophy,%20Aim.pdf 12. In Defence of Nationalism https://www.mkgandhi.org/indiadreams/chap03.htm 13. Unlocking Youth Potential for Nation Building: Strengthening NYKS and NSS https://www.undp.org/india/projects/strengthening-nyks-and-nss
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