

 <p>SHIVAJI UNIVERSITY, KOLHAPUR - 416004, MAHARASHTRA PHONE : EPABX – 2609000, www.unishivaji.ac.in, <u>bos@unishivaji.ac.in</u> शिवाजी विद्यापीठ, कोल्हापूर - ४१६००४, महाराष्ट्र दूरध्वनी - ईपीएबीएक्स - २६०९०००, अभ्यासमंडळे विभाग दूरध्वनी विभाग २३१-२६०९०९३/९४</p>	<p>SHIVAJI UNIVERSITY, KOLHAPUR - 416004, MAHARASHTRA PHONE : EPABX – 2609000, www.unishivaji.ac.in, <u>bos@unishivaji.ac.in</u> शिवाजी विद्यापीठ, कोल्हापूर - ४१६००४, महाराष्ट्र दूरध्वनी - ईपीएबीएक्स - २६०९०००, अभ्यासमंडळे विभाग दूरध्वनी विभाग २३१-२६०९०९३/९४</p>	
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SU/BOS/Science/589

Date: 08 / 08/ 2023

To,
The Principal,
All Affiliated Concerned Science Colleges/Institutions
Shivaji University, Kolhapur.

Subject :- Regarding Syllabi of BCA Part- I (NEP-2020) degree programme under the Faculty of Science and Technology as per National Education Policy 2020

Sir/Madam,

With reference to the subject mentioned above, I am directed to inform you that the university authorities have accepted and granted approval to the syllabi and Nature of question paper of **BCA. Part- I** under the Faculty of Science and Technology as per **National Education Policy 2020**.


Sr. No.		Programme/Course
1	Computer Science Engineering & Technology	BCA Part- I

This syllabi and nature of question paper shall be implemented from the Academic Year **2023-2024** onwards. A soft copy containing the syllabus is attached herewith and it is also available on university website www.unishivaji.ac.in (students Online Syllabus)

You are, therefore, requested to bring this to the notice of all students and teachers concerned.

Thanking you,

Dy Registrar


(Dr. S. M. Kubal)

Copy to:

1	The Dean, Faculty of Science & Technology	7	Appointment Section
2	Director, Board of Examinations and Evaluation	8	P.G.Seminar Section
3	The Chairman, Respective Board of Studies	9	Computer Centre (I.T.)
4	B.Sc. Exam	10	Affiliation Section (U.G.)
5	Eligibility Section	11	Affiliation Section (P.G.)
6	O.E. I Section	12	P.G.Admission Section

SHIVAJI UNIVERSITY,KOLHAPUR



NAAC "A++" Grade with CGPA 3.52

Multiple Entry and Multiple Exit Option(NEP-2020)

Syllabus for
Bachelor of Computer Application
(Under Faculty of Science and Technology)

PART- I SEMESTER- I & II

(Syllabus to be implemented from Academic year 2023-24)

Shivaji University, Kolhapur

Bachelor of Computer Application (BCA)

(Under Faculty of Science and Technology)

Program Outcomes

Upon successful completion of the BCA, the student should have met the following Outcomes:

1. Appreciate and apply mathematical organization, computing, and domain information for the conceptualization of computing models from clear harms.
2. Facility to apply and give expert principles and cyber systems in a universal monetary situation
3. Ability to function as an effective communicator and team member through essential skills in multidisciplinary projects.
4. Understand, analyze and develop computer programs in the areas related to algorithms, web design, and networking for efficient design of the computer-based system.
5. Classify opportunities, private enterprise dreams, and use of original thoughts to build worth and means for the betterment of the human being and the world
6. Work in the IT sector as a system engineer, software tester, junior programmer, web developer, system administrator, software developer, etc.
7. To develop an interdisciplinary approach among the students

Program Specific Outcome (PSO)

1. An ability to enhance the application of knowledge of theory subjects in diverse fields.
2. Encouraging students to convert their start-up idea to reality by implementing
3. Focuses on preparing the student for roles in computer applications and the IT industry
4. Develop programming skills, networking skills, learn applications, packages, programming languages, and modern techniques of IT
5. Information about various computer applications and the latest development in IT and communication systems is also provided
6. Ability to identify, formulates, analyze and solve problems of programming using different languages.
7. Take up self-employment in the Indian & global software market.
8. To pursue a career in the corporate sector can opt for M.Sc, MCA.
9. The student will be able to know various issues, and the latest trends in technology development and thereby innovate new ideas and solutions to existing problems

1. Introduction

- a) The name of the program shall be Bachelor of Computer Application (BCA).
- b) After completion students will be able to apply standard software engineering practices and strategies in software project development using an open-source programming environment to deliver a quality product for business success.
- c) Job Opportunities: The program addresses the job requirements in many domains such as web development, mobile development, Testing and one involving an assortment of hardware and software.
- d) Many graduates begin their careers as junior programmers and, after some experience, are promoted as system analysts. Others seek an entrepreneurial role in the Information Technology world as independent business owners, software authors, consultants, or suppliers of systems and equipment.
- e) Career opportunities exist in such areas as management software and hardware sales, technical writing, training others on a computer, consulting, software development, and technical support. Application areas in the Information Technology world as independent business owners, software authors, consultants, or suppliers of systems and equipment.
- f) Career opportunities exist in such areas as management software and hardware sales, technical writing, training others on the computer, consulting, software development and technical support. Application areas include transaction processing, accounting functions, sales analysis, games, forecasting and simulation, database management, decision support and data communications.
- g) The present curricula focus on the learning aspect from three dimensions viz. Conceptual Learning, Skills Learning and Practical / Hands-on.

2. Medium of Instruction:

The medium of instruction will be English only

3. Admission Procedure

To be eligible for admission to the Bachelor of Computer Application a candidate must have passed

- a) HSC (10+2) from any stream

OR

- b) Three Year Diploma Course (after SSC i.e. 10th Standard), of Board of Technical Education conducted by Government of Maharashtra or its equivalent

4. Course Structure:

Lectures and Practical should be conducted as per the scheme of lectures and practicals indicated in the course structure.

5. Teaching and Practical Scheme

- a) Each contact session for teaching 60 minutes each.
- b) One Practical Batch should be of 30 students.
- c) Practical evaluation should be conducted after the commencement of University examination

6. Project Work:

- a) Project work may be done individually or in groups in case of bigger projects. However if project is done in groups, each student must be given a responsibility for a distinct module and care should be taken to see the progress of individual modules is independent of others.
- b) Students should take guidance from assigned guide and prepare a Project Report on "Project Work" in two copies to be submitted to the Head of the Department.
- c) The project report should contain an Introduction to Project, which should clearly explain the project scope in detail. Also DFDs, ERDs, UML diagrams, database designs and a list of output reports should be included.
- d) The project Work should be of such a nature that it could prove useful or should be relevant from the commercial/Societal angle.
- e) The project report will be duly accessed by the assigned guide and internal marks will be communicated by the Director of the Institute/Head of the Department.
- f) The project report should be prepared in a format prescribed by the University, which also specifies the contents and methods of presentation. IEEE Computer Society templates are recommended in this regard.
- g) The external viva shall be conducted by a panel of minimum two examiners out of which one will be external and other will be internal examiner.

OR

The student shall be allowed to formulate a proposal for startup and the same shall be rated equivalent to project. A detailed problem statement showing innovation along with marketability, business plan and cash flow shall be part of the evaluation criteria.

7. Assessment

- 1. The project will be evaluated by the university appointed examiners both internal as well as external.
- 2. The final practical examination will be conducted by the university appointed examiners both internal as well as external at the end of semester for each lab course and marks will be submitted to the university by the panel.
- 3. The practical examination will be conducted semester wise in order to maintain the relevance of the respective theory course with laboratory course.

4. The final examinations shall be conducted at the end of the semester.

5. Nature of question paper:

Nature of question paper is as follows for University end semester examination

❖ **Theory Examination:**

1. Each paper will carries 50 Marks.
2. Question No.1 is compulsory and is of multiple choice questions. There will be 10 multiple choice question each carries 1 mark
3. Question No.2 will be having 3 question out of which 2 Question needs to be solved. Each carries 10 Marks.
4. Question No.3 will be having 6 questions out of which 4 question needs to be solved. Each carries 5 Marks.

❖ **Practical Examination:**

1. Each paper carries 50 Marks
2. Duration of Practical Examination: 2 Hrs
3. Nature of Question paper: There will be three questions out of which any two questions to be attempted and each question carries 20 Marks.
4. Journal carries 10 Marks

8. Standard of Passing:

1. Minimum 40 marks in each subject. There shall be separate passing for theory and practical.
2. Admission to BCA Part II is allowed even if the student has full ATKT (i.e. All subjects of First year of BCA)
3. Admission to BCA part III is allowed only if the students clear all the subjects of BCA Part I. No student is allowed to take admission to third year of BCA unless they clears all the papers of first year
4. Admission to BCA Part III is allowed even if student has full ATKT (i.e. All subjects of Second year of BCA)

9. Board of Paper Setters /Examiners:

For each Semester end examination there will be a board of Paper setters and examiners for every course. While appointing paper setter /examiners, care should be taken to see that there is at least one person specialized in each unit of the course.

10.Credit system implementation:

As per the University norms

11.Clarification of Syllabus:

The syllabus committee should meet at least once in a year to study and clarify any difficulties from the Institutes.

12.Eligibility of Faculty:

MCA (from any faculty) or M.Sc. (Computer Science) or M.Tech. (CS) with at least B+ or equivalent

13. Revision of Syllabus:

As the computer technology experience rapid rate of obsolescence of knowledge, revision of the syllabus should be considered every two/three years.

14.Fees Structure: 18000/- (Tuition Fees) + other fees as approved by the Shivaji University fee fixation committee

15. Intake Capacity: 60

16.Award of Class:

There will be numerical marking on each question. At the time of declaration of the result the marks obtained by the candidate is converted into grade point as shown below;

Grade Point Table

Range of Marks obtained out of 100 or any fractions	Grade Points
0	0 To 5
1	6 To 10
1.5	11 To 15
2	16 To 20
2.5	21 To 25
3	26 To 30
3.5	31 To 35
4	36 To 40
4.5	41 To 45
5	46 To 50
5.5	51 To 55
6	56 To 60
6.5	61 To 65
7	66 To 70

7.5	71 To 75
8	76 To 80
8.5	81 To 85
9	86 To 90
9.5	91 To 95
10	96 To 100

Grading: Shivaji University has introduced a Seven-point grading system as follows:

BCA Part I Semester I & II

Multiple Entry and Multiple Exit Option (NEP-2020)

Syllabus to be implemented from Academic Year 2023-24

Sr. No.	Marks Range out of 100	Grade Point	Letter grade
1.	80-100	10	O: Outstanding
2.	70-79	9	A+:Excellent
3.	60-69	8	A:Very Good
4.	55-59	7	B+:Good
5.	50-54	6	B: Above Average
6.	45-49	5	C:Average
7.	40-44	4	P:Pass
8.	0-39	0	F:Fail
9.	Absent	0	Ab: Absent

1. Title: BCA
2. Year of implementation: Syllabus will be implemented from June 2023 onwards
3. Duration: BCA Part- I. The duration of course shall be one year (Two semesters).
4. Pattern: Pattern of examination will be semester
5. Structure Of Course:

Multiple Entry and Multiple Exit Option (NEP-2020)
BCA Program Structure
BCA Part - I (Level-4.5)

SEMESTER-I (Duration- Six Month)										
Sr. No.	Course Code	Teaching Scheme			Examination Scheme					
		Theory and Practical			University Assessment (UA)			Internal Assessment (IA)		
		Lectures (Per week)	Hours (Per week)	Credit	Maximum Marks	Minimum Marks	Exam. Hours	Maximum Marks	Minimum Marks	Exam. Hours
1	CC-101: Basics of C	2	2	2	40	16		10	04	
2	CC -102: Fundamentals of Operating System	2	2	2	40	16		10	04	
3	CCPR -103: Programming with C Lab	-	-	2	40	16		10	04	
4	Open Elective (OE): Basics of Electronics	2	2	2	40	16		10	04	
5	Open Elective (OE): Basics of RDBMS	2	2	2	40	16		10	04	
6	VSC: Fundamentals of Computers	2	2	2	40	16		10	04	
7	SEC: Office Automation	2	2	2	40	16		10	04	
8	AEC: Basics of Communication	2	2	2	40	16		10	04	
9	VEC: Fundamentals of Environmental Science	2	2	2	40	16		10	04	
10	IKS: Critical Thinking, Human Values, and Ethics	2	2	2	40	16		10	04	
11	CC: Fundamentals of Mathematics	2	2	2	40	16		10	04	
	Total (A)			22	440			110		

SEMESTER-II (Duration- Six Month)										
Sr. No.	Course Code	Teaching Scheme			Examination Scheme					
		Theory and Practical			University Assessment (UA)			Internal Assessment (IA)		
		Lectures (Per week)	Hours (Per week)	Credit	Maximum Marks	Minimum Marks	Exam. Hours	Maximum Marks	Minimum Marks	Exam. Hours
1	CC-201: Advanced C			2	40	16		10	04	
2	CC -202: Advanced Operating System			2	40	16		10	04	
3	CCPR - 203: Advanced C Lab			2	40	16		10	04	
4	Open Elective (OE): Advanced Electronics			2	40	16		10	04	
5	Open Elective (OE): Advanced RDBMS			2	40	16		10	04	
6	VSC:			2	40	16		10	04	
7	SEC: Web Designing			2	40	16		10	04	
8	AEC: Business Communications			2	40	16		10	04	
9	VEC: Environmental Pollution			2	40	16		10	04	
10	IKS:			2	40	16		10	04	
11	CC: Matrices and Graph Theory			2	40	16		10	04	
	Total (B)			22	440			110		
	Total (A+B)			(22+22) 44	880			220		

<ul style="list-style-type: none"> • Student contact hours per week : 24 Hours (Min.) 	Total Marks for BCA-I: 1100
<ul style="list-style-type: none"> • Theory and Practical Lectures : 60 Minutes Each 	<ul style="list-style-type: none"> • Total Credits for B.C.A-I (Semester I & II) : 44
<ul style="list-style-type: none"> • CC-Core Course • CCPR-Core Course Practical • RM: Research Methodology • OJT: On job training Internship: Student must complete on job training/ Internship during summer break. 	<ul style="list-style-type: none"> • Practical Examination is Semester wise before theory Examination. • Examination for CCPR -103 shall be based on Semester-I Practical • Examination for CCPR -203 shall be based on Semester-II Practical. • *Duration of Practical Examination as per respective BOS guidelines • Separate passing is mandatory for Theory, Internal and Practical Examination
<ul style="list-style-type: none"> • Requirement for Entry at Level 4.5: Completed all requirements of the 10+2 	
<ul style="list-style-type: none"> • Exit Option at Level 4.5: Students can exit after Level 4.5 with under certificate course in Computer Programming if he/she completes the course equivalent to minimum of 44 credits and an additional 4 credits core NSQF course/Internship. 	

Bachelor of Computer Application
Multiple Entry and Multiple Exit Option
(NEP-2020)
BCA PART I SEM I

Course code: CC-101

Title of course: Basics of C

Theory: 30

Marks: 50

Credit: 02

Course Outcomes:

The course will enable students to;

1. Understand Fundamental concepts of Computer
2. Basic knowledge of peripheral devices

Course Outcomes:

The course will enable students to;

1. To make the student learn a programming language
2. To develop logics which will help them to create programs, applications in C
3. Switch over to any other language in future

UNIT I

(15 HOURS)

Introduction to the C Language – Algorithm, Pseudo code, Flow chart, Background, C Programs, Identifiers, Data Types, Variables, Constants, Input / Output, Operators(Arithmetic, relational, logical, bitwise etc.), Expressions, Precedence and Associativity, Expression Evaluation, Type conversions, Program execution phases, format specifiers.

UNIT II

(15 HOURS)

Statements: Selection Statements (making decisions) – if and switch statements, Repetition statements (loops)-while, for, do-while statements, Loop examples, other statements related to looping – break, continue, go to, ternary operators

Arrays: Basic concepts, one-dimensional arrays, two – dimensional arrays, multidimensional arrays, C programming examples Pointers – Introduction (Basic Concepts), pointers to pointers, compatibility, Pointer Applications, Arrays and Pointers

Reference Books:

1. Let Us C by Yashavant Kanetkar
2. C: The Complete Reference by Herbert Schildt
3. C Programming Language by Darrel L. Graham
4. The C Programming Language By Pearson
5. 'C' Programming in an Open Source Paradigm: A Hands on Approach by K.S.Oza, S.R.Patil and R.K.Kamat

Bachelor of Computer Application
Multiple Entry and Multiple Exit Option
(NEP-2020)
BCA PART I SEM I

Course code: CC-102

Title of course: Fundamentals of Operating System

Theory: 30

Marks: 50

Credit: 02

Course Outcomes:

After completion of this course students will be able to;

1. Understand fundamental operating system
2. Learn types of operating systems, Scheduling
3. Learn Process Synchronization, Deadlock Prevention, and Avoidance

UNIT I

(15 HOURS)

Evolution of Operating Systems: Introduction, Types of operating systems, Computer System Organization, Architecture, Structure, Operations, Process Management, Memory Management, Storage Management, Kernel Data Structures, Computing Environments. Operating System Structures: Services, System Calls, Types, Operating System Structure, System Boot. Processes: Process Concept, Scheduling, Operations, Interprocess Communication. Multithreaded Programming: Multicore Programming, Multithreading Models.

UNIT II

(15 HOURS)

Process Synchronization: The Critical-Section Problem, Peterson's Solution, Synchronisation Hardware, Mutex Locks, Semaphores, Classic Problems of Synchronization, Monitors, Synchronization Examples. Process Scheduling: Criteria, Scheduling Algorithms, Multi-Processor Scheduling, Real-time CPU Scheduling. Deadlocks: System model, Characterization, Methods for handling deadlocks, Deadlock Prevention, Avoidance, Detection and Recovery from deadlock.

Reference Books:

1. William Stallings, "Operating Systems-Internals and Design Principles", Pearson, IX Edition, 2018
2. D M Dhamdhare: Operating Systems – A Concept Based Approach, III Edition, Tata McGraw – Hill, 2015.
3. Harvey M Deitel, Paul J Deitel, Dr Choffnes, Operating Systems, Pearson Education Limited (Publisher), 3rd Edition, 2013.
4. J. Archer Harris, John Cordani, Operating Systems, Schaum's Outline, Indian Edition, McGraw Hill Education (India), First Edition

Bachelor of Computer Application
Multiple Entry and Multiple Exit Option
(NEP-2020)
BCA PART I SEM I

Course code: CCPR-103

Title of course: Programming with C Lab

Practical: 30

Marks: 50

Credit: 02

Course Outcomes:

After completion of this course students will be able to;

- 1) To make the student learn a programming language.
- 2) To learn problem solving techniques.
- 3) To teach the student to write programs in C and to solve the problems

Lab work is based on C Programming Language. This laboratory course will consist of 25 to 30.

Programming exercises with focus on covering the hands-on aspects covered in theory course.

Bachelor of Computer Application
Multiple Entry and Multiple Exit Option
(NEP-2020)
BCA PART I SEM I

Course code: Open Elective 1
Title of course: Basics of Electronics
Theory: 30
Marks: 50
Credit: 02

Course Outcomes:

After completion of this course students will be able to;

1. Understand the concept of number system
2. Understand the functionality of logic gates

UNIT I

(15 HOURS)

Number Systems: Introduction to Decimal, Binary, Hexadecimal Number System Interconversion from one system to Another (examples), code, Gray code, Excess-3 code, ASCII code, EBCDIC code, Concept of parity bit, Signed and unsigned numbers representation, 1's & 2's complement of binary numbers, 9's complement and binary arithmetic, Hamming code for error correction & detection

UNIT II

(15 HOURS)

Logic Gates : AND, OR, NOT, NOR, NAND, EX-OR (Symbol, Expression and Truth Table), Application of EX-OR gate, Boolean algebra and identities, De Morgan's theorem and Interconversion of logic Gates (NAND and NOR), Simplifications of logic expressions using : Boolean algebra, K map with examples, Introduction to logic families (TTL, ECL, CMOS), TTL NAND gate & CMOS NOT gate, Input output parameters Logic levels, switching speed, propagation delay, power dissipation, noise margins and fan in-out of TTL and CMOS, Tristate logic (inverter & buffer)

Reference Books:

1. Digital Fundamentals by Morris and Mano, PHI Publication
2. Fundamental of digital circuits by A.Anandkumar, PHI Publication
3. Digital Fundamentals by Floyd & Jain, Pearsons Pub
4. Fundamentals of Logic Design by Charles H. Roth Thomson

Bachelor of Computer Application
Multiple Entry and Multiple Exit Option
(NEP-2020)
BCA PART I SEM I

Course code: Open Elective 2
Title of course: Basics of RDBMS
Theory: 30
Marks: 50
Credit: 02

Course Outcomes:

1. To analyze and design the basic elements of Relational Database Management System.
2. To identify the relevant data models for problems.

UNIT I

(15 HOURS)

Introduction: Database and Database Users, Characteristics of the Database Approach, 3 Tier Architecture, Implications of Database Approach, Advantages of using RDBMS over DBMS. Database System Concepts. Data Models, Schemas, Instances. Data Independence, Database languages and interfaces. Classification of DBMS, DDL- Create, Alter, Drop, Truncate. DML- Insert, Update, Delete. DCL- Grant, Revoke, TCL- Commit, Rollback, Savepoint. DQL- Select. Where, AND, OR, NOT, Aliases, Having, Exists, Operators, Date. Set operations, order by, group by, like, between. Functions: Min, Max, Sort, Count, Average.

UNIT II

(15 HOURS)

Data Modeling Using the Entity-Relationship Model concepts :Entity types, Entity sets, attributes, Different types of Keys, Notation for ER Diagrams, Proper naming of Schema, Relationship, Generalization, Aggregation. Primary File Organization: Secondary Storage Devices. Operations on Files, File of unordered Records(Heap files), Files of Ordered Records (Sorted files), Hashing Techniques. Recovery system- Failure classification, storage structure, log based recovery, Role of DBA

Reference Books:

1. Abrahamsi. Silberschatz, Henry. F. Korth, S. Sudarshan, Database System Concepts, 6th Edition, McGraw Hill, 2012
2. C.J.Date, Introduction to database systems, Eight Edition, Addison Wesley, 2003

Bachelor of Computer Application
Multiple Entry and Multiple Exit Option
(NEP-2020)
BCA PART I SEM I

Course code:

Title of course: Fundamentals of Computers

Theory: 30

Marks: 50

Credit: 02

Course Outcomes:

The course will enable students to;

1. Understand Fundamental concepts of Computer
2. Basic knowledge of peripheral devices

UNIT I

(15 HOURS)

Introduction to computer, Characteristics of Computers, Block diagram of computer, History of computers, Generations of computer, Classification of Computers, Operating principles (based on their construction and working) – Digital, Analog & Hybrid, Applications of computer, Types of computers and features - micro, mini, mainframe and supercomputers, Number of Microprocessors – Sequential & Parallel, Number of users – Single User, Multi User, Network

UNIT II

(15 HOURS)

Components of Computer System, Central Processing Unit (CPU), ALU, Input Devices: Keyboard, Point and draw devices- mouse, joystick, light pen, Data Scanning devices- image scanner, OCR, OMR, MICR, Bar code reader, card reader, Voice Recognition Device. Output Devices- Monitor, Printer-Types of printer's, Projector. Computer Memory- Types of Memory (Primary And Secondary), RAM, ROM, Secondary Storage Devices (FD, CD, HD, Pen drive)

Reference Books:

1. Computer Fundamentals by Pradeep K. Sinha, Priti Sinha
2. Fundamentals of Computers by V. Rajaraman
3. Computer Fundamentals: Architecture and Organization by B. Ram
4. UNIX Concepts And Applications by Sumitabha Das
5. A Practical Guide to Linux Commands, Editors, and Shell Programming by Mark G. Sobell

Bachelor of Computer Application
Multiple Entry and Multiple Exit Option
(NEP-2020)
BCA PART I SEM I

Course code: SEC

Title of course: Office automation

Theory: 30

Marks: 50

Credit: 02

The course will enable students to;

1. Understand the basics of MS Word
2. Understand the functionalities of MS Excel
3. Understand the working of PowerPoint.
4. Understand the uses of internet and email

UNIT I

(15 HOURS)

MS Word: Working with Documents -Opening & Saving files, Editing text documents, Formatting page & setting Margins, Formatting Documents - Setting Font styles, Font selection- style, size, colour etc, Type face - Bold, Italic, Underline, Case settings, Highlighting, Special symbols, Setting Paragraph style, Alignments, Indents, Line Space, Margins, Bullets & Numbering. Setting Page style Creating Tables- Table settings, Borders, Alignments, Insertion, deletion, Merging, Splitting, Sorting, and Formula, Drawing - Inserting ClipArts, Pictures/Files etc. **MS Excel:** Spread Sheet & its Applications, Opening Spreadsheet, Menus - main menu, Formula Editing, Formatting, Toolbars, Using Icons, Spreadsheet types. Working with Spreadsheets opening, Saving files, setting Margins, Spread sheet addressing - Rows, Columns & Cells, Referring Cells & Selecting Cells – Shortcut Keys. Inserting Data, Insert Cells, Column, rows & sheets, Symbols, Data from external files, Frames, Clipart, Pictures, Files etc, Inserting Functions, Manual breaks, Setting Formula - finding total in a column or row, Mathematical operations, other Formulae, Formatting Spreadsheets

UNIT II

(15 HOURS)

MS Power point: Introduction to presentation – Opening new presentation, Different presentation templates, setting backgrounds, selecting presentation layouts. Creating a presentation, Setting Presentation style, Adding text to the Presentation. Formatting a Presentation- Adding style, Colour, gradient fills, Arranging objects, Adding Header & Footer, Slide Background, Slide layout. Adding Graphics to the Presentation- Inserting pictures, movies, tables etc into presentation, Adding Effects to the Presentation- Setting Animation & transition effect.

Internet and Web Browsers: Definition & History of Internet , Uses of Internet - Definition of Web Addressing-URL-Different types of Internet Connections; Dial up connection, Broad band (ISDN, DSL, Cable), browsers and its types, internet browsing, searching - Search Engines - Portals - Social Networking sites- Blogs - viewing a webpage, Creating an email-ID, e-mail reading, saving, printing,

forwarding and deleting the mails, checking the mails, viewing and running file attachments, addressing with cc and bcc.

Typing Skills: Typing and Keyboarding for Business Professionals

Reference Books:

1. Microsoft Word 2010: Level 2, by Judy Mardar and Pamela R. Toliver
2. Excel 2016 Bible 1st Edition by John Walkenbach.
3. PowerPoint For Dummies, Office 2021 Edition 1 st Edition by Doug Lowe
4. Introduction to Information Technology - Alexis Leon, Mathews Leon, and Leena Leon, Vijay Nicole Imprints Pvt. Ltd., 2013.
5. Computer & Internet Basics Step-by-Step - Etc-end the Clutter - Infinity Publishing

Bachelor of Computer Application
Multiple Entry and Multiple Exit Option
(NEP-2020)
BCA PART I SEM I

Course code:

Title of course: Basics of Business Communication

Theory: 30

Marks: 50

Credit: 02

Course Outcomes:

After completion of this course students will be able to;

1. To provide an overview of Prerequisites to Business Communication
2. To put in use the basic mechanics of Grammar
3. To underline the nuances of Business communication
4. To impart the correct practices of the strategies of Effective Business writing

UNIT I

15 HOURS

Need and Importance of effective communication skills, Basic ways of communication (Listening, Speaking, Reading, Writing), Forms/methods of Communication (verbal-oral and written; non-verbal- Body language, facial expressions, eye contact, gestures, postures, paralinguistic features, signs, symbols, signals etc.), Communication cycle/process (sender, receiver, message, medium/channel, feedback, encoding and decoding) (Thinking, getting ideas, determining intent, selecting notes, and media, encoding, transmitting messages, decoding, receiving, perceiving, and interpreting, giving feedback, etc.), Barriers to communication (physical, mechanical, psychological, socio-cultural, linguistic, inter-personal, organizational, etc.) and techniques to overcome them.

UNIT II

15 HOURS

Levels of communication: importance and nature (extra-personal, intrapersonal, interpersonal, transpersonal, organizational, mass and media communication, Communication in business context (channel/flow of communication in business context: formal, informal, vertical, horizontal/lateral, crosswise, grapevine, etc), Written Communication, the process of formal written communication – Designing a message, deciding purpose, analyzing audience, organizing, selecting, arranging ideas, and preparing outlines, enveloping a message – writing, evaluating, revising, and editing. Reading and analysis of Business articles, short reports, success stories and caselets.

Reference Books

1. Communication Skills by Meenakshi Raman and Sangeeta Sharma
2. Communication Skills by Kumar and Lata
3. Business Communication by Raman and Sing

4. A Complete Course in Communication Skills by Dr. Ravi S. Sharma, Sheel Sons
5. Essentials of Business Communications by Rajendra Pal J.S. Korlahalli
6. Business Communication by Dr. Prakash M. Herekar, Mehta Publishing House Business Communication
by U.S. Rai, S.M. Rai

Bachelor of Computer Application
Multiple Entry and Multiple Exit Option
(NEP-2020)
BCA PART I SEM I

Course code: VEC

Title of course: Fundamentals of Environmental Science

Theory: 30

Marks: 50

Credit: 02

Course Outcomes:

The course will enable students to;

1. To understand basic concepts of environment.
2. To understand concept of biodiversity and its conservation measures.

UNIT I

15 HOURS

Definition, principles and scope of Environmental Science, Components of Environment: Introduction, Atmosphere, Hydrosphere, Lithosphere and Biosphere, Natural Resources: Concept, types of resources; Renewable and Non-renewable resources, water resource, forest resources, mineral resources, energy resources, food resources, land resources, coal, petroleum, natural gas, nuclear energy, Ecosystem: Concept, Components of ecosystem, Types of Ecosystems, Productivity and energy flow, Food chain and Food webs, Ecological Pyramids, Lake Environment, Material cycle in ecosystem- Carbon cycle, oxygen cycle, nitrogen cycle, phosphorus cycle, sulphur cycle, mineral cycle, Basic concepts of population ecology, population dynamics, characteristics of population: natality, mortality, fecundity, density, age distribution, relationships among organisms, population explosion, Community types and community composition

UNIT II

15 HOURS

Levels of biological diversity: genetic, species and ecosystem diversity, Biogeographic zones of India; Biodiversity patterns and global biodiversity hot spots, India as a mega-biodiversity nation; Endangered and endemic species of India, Threats to biodiversity: Habitat loss, poaching of wildlife, man-wildlife conflicts, biological invasions, Conservation of biodiversity: In-situ and Ex-situ conservation of biodiversity, Sanctuaries, National Parks, Biosphere reserves

Reference:

1. Environmental science by S. C. Santra, New Central Book Agency (P) Ltd.
2. Chemistry of Environment by Thomas G. Spiro and William M. Stigiliani (Prentice Hall of India Private Limited, New Delhi-110001)
3. Environmental Studies by Dr. P. D. Raut Department of Environmental Science, Shivaji University, Kolhapur

Bachelor of Computer Application
Multiple Entry and Multiple Exit Option
(NEP-2020)
BCA PART I SEM I

Course code: IKS

Title of course: Critical Thinking, Human Values, and Ethics

Theory: 30

Marks: 50

Credit: 02

Course Objectives:

1. Understand the principles of thinking and reasoning, and their application in decision-making
2. Familiarize students with the major ethical theories and concepts
3. Develop skills in ethical reasoning and decision-making
4. Explore the role of human values in societal contexts
5. Encourage critical discussion about the complex relationship between thinking, ethics, and values

UNIT I

15 HOURS

Foundations of Thinking and Reasoning: Introduction to Thinking and Reasoning, Cognitive Biases and Heuristics, Logical and Critical Thinking, Reasoning Critically

UNIT II

15 HOURS

Human Ethics and Values: Introduction to Ethics and Moral Philosophy, Application of Ethics, Ethical Reasoning and Decision Making, Human Values and Society

References

1. Baggini, J., Fosl, P. S. (2007). The ethics toolkit: A compendium of ethical concepts and methods. Blackwell Pub.
2. Chaffee, J. (2018). Thinking critically (12th ed.). Cengage Learning.
3. Driver, J. (2013). Ethics: The fundamentals. Wiley.
4. Hughes, W., Lavery, J. (2016). Critical thinking: An introduction to the basic skills (Concise). Broadview Press.
5. Ruggiero, V. R. (2012). Beyond feelings: A guide to critical thinking (9th ed.) McGraw-Hill

Bachelor of Computer Application
Multiple Entry and Multiple Exit Option
(NEP-2020)
BCA PART I SEM I

Course code: CC

Title of course: Fundamentals of Mathematics

Theory: 30

Marks: 50

Credit: 02

Course Outcomes:

The course will enable students to;

1. Basic knowledge of set theory, functions and relations concepts, matrix needed for designing and solving problems.
2. Construct simple mathematical proofs and possess the ability to verify them.

UNIT I

15 HOURS

SETS: Introduction, Methods of describing of a set: Tabular form, Set builder form, Finite set, Infinite set, Empty set, Subset, Universal set, Equal sets, Disjoint sets, Complementary set, Operation on Sets: Union of sets, Intersection of sets, Difference of sets, Examples, De Morgan's Laws (without proof), Venn diagram, Examples, Cartesian product of two sets, Examples, Idempotent laws, Identity laws, Commutative Laws, Associative laws, Distributive laws, Inverse laws, Involution laws, Duality, Computer Representation of sets and its operations, Relations and Functions: Introduction, Operations on Functions, Injective, surjective and bijective functions.

UNIT I

15 HOURS

Logic: Introduction, Definition: Statement (Proposition), Types of Statements: Simple and compound statements, Truth values of a statement, Truth Tables and construction of truth tables, Logical Operations: Negation, Conjunction, Disjunction, Implication, Double Implication, Equivalence of Logical statements, Converse, Inverse and Contra positive, Statement forms: Tautology, Contradiction, and Contingency, Duality, Laws of logic: Idempotent laws, Commutative laws, Associative laws, Identity laws, Involution laws, Distributive laws, Complement laws, De Morgan's laws, Argument: Valid and Invalid arguments, Examples based on above.

Reference Books:

1. Discrete Mathematics & Structures by Satinder Bal Gupta
2. Fundamental Approach to Discrete Mathematics by D. P. Acharjya, Sreekumar
3. Discrete Mathematical Structures by Kolman, Busby, Ross

Bachelor of Computer Application
Multiple Entry and Multiple Exit Option
(NEP-2020)
BCA PART I SEM II

Course code: CC-201
Title of course: Advanced C
Theory: 30
Marks: 50
Credit: 02

Course Outcomes:

The course will enable students to;

1. To impart knowledge in creating and using Arrays of the C data types.
2. Write programs that perform operations using derived data types

UNIT I

15 HOURS

Functions: Introduction to Structured Programming, Functions- basics, user defined functions, inter function communication (call by value, call by reference), Standard functions. Storage classes, arrays to functions, recursive functions, example C programs. Structures, Union, Preprocessor

UNIT II

15 HOURS

Strings: Concepts, C Strings, String Input / Output functions, string manipulation functions, string /data conversion. Input and Output – Concept of a file, streams, text files and binary files, Differences between text and binary files, State of a file, Opening and Closing files, file input / output functions (standard library input / output functions for files), file status functions (error handling), Positioning functions.

Reference Books:

1. Let Us C by Yashavant Kanetkar
2. C: The Complete Reference by Herbert Schildt
3. C Programming Language by Darrel L. Graham
4. The C Programming Language By Pearson
5. 'C' Programming in an Open Source Paradigm: A Hands on Approach by K.S.Oza, S.R.Patil and R.K.Kamat

Bachelor of Computer Application
Multiple Entry and Multiple Exit Option
(NEP-2020)
BCA PART I SEM II

Course code: CC-202

Title of course: Advanced Operating System

Theory: 30

Marks: 50

Credit: 02

Course Outcomes:

After completion of this course students will be able to;

1. Understand the concept of Memory Management
2. Understand File-System and Directory Implementation.

UNIT I

15 HOURS

Memory Management Strategies: Background, Swapping, Contiguous Memory Allocation, Segmentation, Paging, Structure of the Page Table. Virtual Memory Management: Demand Paging; Copy-on-Write, Page Replacement; Allocation of Frames; Thrashing, Memory-Mapped Files, Allocating Kernel Memory. File System: File Concept, Access Methods, Directory and Disk Structure, Protection. File-System Implementation: Structure

UNIT I

15 HOURS

File-System and Directory Implementation, Allocation Methods, Free Space Management, Efficiency and Performance, Recovery. Mass-Storage Structure: Overview, Disk Scheduling, Disk Management. Distributed Systems: Advantages, Types of Network- based OS, Robustness, Design Issues, Distributed File Systems. Case Studies: The Linux System, Windows 10 (Process, Memory, storage management).

Reference Books:

1. William Stallings, “Operating Systems-Internals and Design Principles”, Pearson, IX Edition, 2018
2. D M Dhamdhare: Operating Systems – A Concept Based Approach, III Edition, Tata McGraw – Hill, 2015.
3. Harvey M Deitel, Paul J Deitel, Dr Choffnes, Operating Systems, Pearson Education Limited (Publisher), 3rd Edition, 2013.
4. J. Archer Harris, John Cordani, Operating Systems, Schaum's Outline, Indian Edition, Mc Graw Hill Education (India), First Edition

Bachelor of Computer Application
Multiple Entry and Multiple Exit Option
(NEP-2020)
BCA PART I SEM II

Course code: CC-101

Title of course: Advanced C Lab

Theory: 30

Marks: 50

Credit: 02

Course Outcomes:

After completion of this course students will be able to;

1. Manage I/O operations in your C program
2. Repeat the sequence of instructions and points for a memory location
3. Understand the basics of file handling mechanisms

Lab work is based on Advanced C Programming Language especially focusing on functions and file handling. This laboratory course will consist of 25 to 30. Programming exercises with focus on covering the hands-on aspects covered in theory course.

Bachelor of Computer Application
Multiple Entry and Multiple Exit Option
(NEP-2020)
BCA PART I SEM II

Course code: Open Elective
Title of course: Advanced Electronics
Theory: 30
Marks: 50
Credit: 02

Course Outcomes:

The course will enable students to;

1. Present a problem oriented introductory knowledge of Digital circuits and its applications.
2. Focus on the study of electronic circuits

UNIT I

15 HOURS

Combinational Logic Arithmetic Circuits: Binary Addition. Half Adder, Full Adder. Half Subtractor, Full Subtractor, BCD Adder. Data processing circuits: Multiplexers, Demultiplexer, Representation of signed and unsigned numbers De-multiplexers, Decoders, Encoders, BCD-to-seven segment decoder, priority encoder, Decimal- to-BCD priority encoder.

UNIT II

15 HOURS

Sequential Circuits: NOR gate SR latch, NAND gate SR latch, D, and JK Flip-Flops. Applications of Flip-Flops, Race around conditions in JK Flip-Flop. Master-slave JK Flip-Flop. PRESET & CLEAR in Flip-flop, Shift registers: Buffer register, Serial-in-Serial-out, Serial-in-Parallel-out, Parallel-in-Serial-out and Parallel-in-Parallel-out Shift Registers (only up to 4 bits) Counters (4 bits): Ring Counter. Asynchronous counters, Synchronous Counter. UP/DOWN Counter.

Reference Books:

1. Digital Fundamentals by Morris and Mano, PHI Publication
2. Fundamental of digital circuits by A.Anandkumar, PHI Publication
3. Digital Fundamentals by Floyd & Jain, Pearsons Pub
4. Fundamentals of Logic Design by Charles H. Roth Thomson

Bachelor of Computer Application
Multiple Entry and Multiple Exit Option
(NEP-2020)
BCA PART I SEM II

Course code: Open Elective
Title of course: Advanced RDBMS
Theory: 30
Marks: 50
Credit: 02

Course Outcomes:

1. To Learn to Normalize The Databases Using Normalization Techniques.
2. To Use Transaction Processing Concepts & PL /SQL Commands

UNIT I

15 HOURS

Functional Dependencies and Normalization for Relational Database: Relational schemas, Functional Dependencies, Normal Forms: First, Second, Third Normal Forms. Boyce-Codd Normal Form. Relational Data Model and Relational Algebra: Relational Model Concepts, relational Model Constraints and relational Database Schema, defining Relations, Basic Relational Algebra Operations, Examples of queries in the Relational Algebra, Relational Mapping

UNIT II

15 HOURS

Relational Database Language: Introduction to SQL, features of SQL, data types. Views- create, delete, types. Index- Create, Unique, Drop. Joins, PL /SQL: Introduction, Block structure, Data types, Block functions- % Type, % Row Type. Statements: control, Looping, Sequential. Exception Handling.

Transaction Processing Concepts: Introduction, ACID properties, states, Schedules and Recoverability, Serializability, Locking Techniques for Concurrency Control- Binary, Shared/ Exclusive. Simplistic Lock Protocol, Two Phase Locking , Strict Two phase locking, Rigorous Two phase locking. concurrency control protocols- Lock Based, Time Stamp, Validation Based. Cursors- introduction, Implicit, Explicit with examples . Triggers- Introduction, Types with examples. Procedures: Introduction, Create, passing parameters with examples. Functions- Definition, calling methods, passing parameters with examples.

Reference Books:

1. Abrahamsi. Silberschatz, Henry. F. Korth, S. Sudarshan, "Database System Concepts" 6th Edition, McGraw Hill, 2012.
2. C.J.Date, "Introduction to database systems", Eight Edition, Addison Wesley, 2003.

Bachelor of Computer Application
Multiple Entry and Multiple Exit Option
(NEP-2020)
BCA PART I SEM II

Course code: VSC

Title of course: Web Designing

Theory: 30

Marks: 50

Credit: 02

Course Outcomes:

1. Learn how to design and develop a Web page using HTML and CSS.
2. Learn how to link pages so that they create a Web site.
3. Design and develop a web site using text, images, links, lists, and tables

UNIT I

15 HOURS

Introduction to HTML, History of HTML, Editors, HTML Tags, <head>, <body>, <title>, <href>, , HTML formatting elements, table tags, list tags, <iframes>, Introduction to CSS, Types of CSS, id selector, class selector, universal selector, group selector, CSS border styles, CSS margins, text formatting, CSS fonts, CSS icons, Links, lists, table, counters, CSS grid

UNIT II

15 HOURS

Introduction to JavaScript, setting up the development environment, Writing and executing JavaScript code, Declaring and assigning variables, working with numbers, strings, booleans, and arrays, Type coercion and type conversion, Conditional statements, Switch statements, Loops, Break and continue statements, Element, Access in Java scripts, Event and event handling, dialog boxes, Defining and invoking functions, working with arrays, Introduction to objects and properties, Object-oriented programming concepts

Reference Books:

1. Head First HTML and CSS by Elizabeth Robson and Eric Freeman
2. HTML, CSS, and JavaScript All in One by Meloni and Kyrin's
3. HTML 5 and CSS3 All-in-One For Dummies – by Andy Harris

Bachelor of Computer Application
Multiple Entry and Multiple Exit Option
(NEP-2020)
BCA PART I SEM II

Course code:

Title of course: Business Communications

Theory: 30

Marks: 50

Credit: 02

Course Outcomes:

After completion of this course students will be able to;

1. Communicate effectively in various formats
2. Improve writing skills in different format

UNIT I

15 HOURS

Effective speaking (extempore, prepared speeches, group communication), Business presentation skills (preparing effective power point presentations, presenting in a team), Group discussion and debate

UNIT II

15 HOURS

Critical Thinking & Writing Skills – Empower your writing skills: Mind Mapping, Prerequisites to paragraph writing, Methods of Paragraph Development, Precis writing, drafting notice, agenda and minutes of a business meeting, Business correspondence (Business letter writing): Principles, 7Cs, standard elements, standard formats, types- enquiry, reply to enquiry, order, complain, and complain settlement, Business proposal writing

Reference Books:

1. Communication Skills for Engineers and Scientists by Mishra. B, Sharma. S
2. Essentials of Business Communication by Pal, Rajendra and Korlahalli, J.S.
3. Communication Skills for Engineers by C. Muralikrishna and S. Mishra
4. Communication Skills by Meenakshi Raman and Sangeeta Sharma
5. Communication Skills by Kumar and Lata
6. Business Communication by Raman and Sing

**Bachelor of Computer Application
Multiple Entry and Multiple Exit Option
(NEP-2020)
BCA PART I SEM II**

Course code: VEC

Title of course: Environmental Pollution

Theory: 30

Marks: 50 (Credit: 02)

Course Outcomes:

The course will enable students to;

1. To understand pollution of environmental resources and their control
2. To understand global environmental issues

UNIT I

15 HOURS

Environmental pollution: concepts and types, Air pollution: its effects, types of pollutants, types of air pollution – indoor air pollution, vehicular pollution, industrial pollution; air pollution episodes and disasters, Effects of air pollution on human health, animals, plants, material and climate, Formation of fog and smog, acid rain, Water pollution: Concept of water pollution, sources of pollution, effects, control. Concept of eutrophication, biomagnification. Soil pollution: Concept, causes of soil pollution, major soil pollutants, effects, control measures. Definition, sources of thermal pollution, effects of thermal pollution, Control of thermal pollution. Concept noise and marine pollution- causes, effects and controls, Plastic pollution: causes, sources, effects and control measures. Concept of hazardous waste and human health risks, Solid waste management: Control measures of Municipal, biomedical and e-waste

UNIT II

15 HOURS

Global issues: Global warming, Climate change, Ozone layer depletion, Photochemical smog, Acid rain, Deforestation, Biodiversity loss, Desertification, Acidification of Ocean.

Reference Books:

- 1) Environmental Studies by Dr. P. D. Raut Department of Environmental Science, Shivaji University, Kolhapur.
- 2) Environmental science by S. C. Santra. (New Central Book Agency (P) Ltd.)

Bachelor of Computer Application
Multiple Entry and Multiple Exit Option
(NEP-2020)
BCA PART I SEM II

Course code: CC

Title of course: Matrices and Graph Theory

Theory: 30

Marks: 50

Credit: 02

Course Outcomes:

The course will enable students to;

1. Write an argument using logical notation and determine if the argument is valid or is not valid.
2. Use graph algorithms to solve problems.

UNIT I

15 HOURS

Matrices: Introduction, Types of matrices: Row matrix, Column matrix, Null matrix, Unit matrix, Square Matrix, Diagonal matrix, Scalar matrix, Symmetric matrix, Skew - symmetric matrix, Transpose of a matrix, Definition of Determinants of order 2nd & 3rd and their expansions, Singular and Non-Singular Matrices, Algebra of Matrices: Equality of matrices, Scalar Multiplication of matrix, Addition of matrices, Subtraction of matrices, Multiplication of matrices, Elementary Row & Column Transformations, Inverse of Matrix (Using Elementary Transformations), Examples based on above.

UNIT II

15 HOURS

Graphs: Introduction, Simple graph, Multi graph, Pseudo Graph, Digraph, Weighted Graph. Degree of Vertex, Isolated Vertex, Pendant Vertex, Walk, Path, Cycle, Types of Graph: Complete, Regular, Bi-Partite, Complete Bi-partite, Matrix Representation of Graph: Adjacency and Incidence Matrix, Operation on Graph: Union, Intersection, Complement, Examples based on above.

Reference Books:

1. Discrete Mathematics by Schaum Series
2. Discrete Mathematics by K D Joshi
3. Sets, Logic and Maths for Computing by David Makinson
4. Discrete Mathematics and Its Applications by Kenneth H. Rosen
5. Discrete Mathematical Structures with Applications to Computer Science by Trembley, J.P. and Manohar