SU/BOS/Science/   № 0 0 3 2 3 Date: 1 9 SEP 2022

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

Subject :- Regarding syllabi of M.Sc., MCA & BCA (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 **M.Sc., MCA & BCA** under the Faculty of Science and Technology **as per National Education Policy, 2020 .**

Sr. No.	Faculty of Science and Technology	Programme/ Course
1	Computer Science Engineering and Technology	M. Sc. Part- I Computer Science
		MCA. Part- I Computer Science
		BCA. Part- I Bachelor of Computer Application

  This syllabi and nature of question paper shall be implemented from the Academic Year 2022-2023 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,

Yours faithfully,

Dy Registrar

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

Choice Based Credit System with 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 2022-23)

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 48 minutes each.

b) One Practical Batch should be of 30 students.

c) Practical evaluation should be conducted before 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 final total assessment of the candidate is made in terms of an external assessment for each course.

a) For each theory paper, 20% marks will be based on internal assessment and 80% marks for semester examination (external assessment), unless otherwise stated.

2. The project will be evaluated by the university appointed examiners both internal as well as external.

3. 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. The pattern of final Practical Examination will be as follows;

1	Coding and Execution of Program	60 Marks
2	Viva-voce	20 Marks
3	Journal	20 Marks
4	Total	100 Marks

The practical examination will be conducted semester wise in order to maintain the relevance of the respective theory course with laboratory course.

4. The internal marks will be communicated to the University at the end of each semester, but before the semester end examinations. These marks will be considered for the declaration of the results.

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

6. 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 1mark
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 question out of which 4 Question needs to be solved. Each carries 5 Marks.

❖ **Practical Examination:**
1. Duration of Practical Examination: 3 Hrs
2. Nature of Question paper: There will be three questions out of which any two questions to be attempted and each question carries 30 Marks.

8. Standard of Passing:

Internal as well as external examination will be held at the end of semester. The candidate must score 40% marks in each head of internal as well as external Examination

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. The Workshop on syllabi should be organized at the beginning of every semester

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:

Grades	CGPA Credit Points
O	8.60 To 10
A+	7.00 To 8.59
A	6.00 To 6.99
B+	5.50 To 5.99
B	4.50 To 5.49
C	4.00 To 4.49
D	0.00 To 3.99

Overall Final Grades	Class		Grade
8.60 To 10	Higher Distinction Level	Extraordinary	O
7.00 To 8.59	Distinction Level	Excellent	A+
6.00 To 6.99	First Class	Very Good	A
5.50 To 5.99	Higher Second Class	Good	B+
4.50 To 5.49	Second Class	Satisfactory	B

4.00 To 4.49	Pass	Fair	C
0.00 To 3.99	Fail	Unsatisfactory	D

BCA Part I Semester I & II

Choice Based Credit System with Multiple Entry and Multiple Exit Option

(NEP-2020)

Syllabus to be implemented from Academic Year 2022-23

1. TITLE: BCA
2. YEAR OF IMPLEMENTATION: Syllabus will be implemented from June 2022 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:

Semester I

Sr. No.	Course Code	Name of Paper	Marks
1.	DSC A1	Fundamentals of Computer I	50 (Theory)
2.	DSC A2	Fundamentals of Computer II	50 (Theory)
3.	DSC A3	Programming with C I	50 (Theory)
4.	DSC A4	Programming with C II	50 (Theory)
5.	DSC A5	Basics of Mathematics I	50 (Theory)
6.	DSC A6	Basics of Mathematics II	50 (Theory)
7.	DSC A7	Office Automation I	50 (Theory)
8.	DSC A8	Office Automation II	50 (Theory)
9.	AECC–A	Business Communication-I	50 (Theory)

Semester II

Sr. No.	Course Code	Name of Paper	Marks
10.	DSC B1	Operating System I	50 (Theory)
11.	DSC B2	Operating System II	50 (Theory)
12.	DSC B3	Data Structures using C I	50 (Theory)
13.	DSC B4	Data Structures using C II	50 (Theory)

14.	DSC B5	Basics of Electronics I	50 (Theory)
15.	DSC B6	Basics of Electronics II	50 (Theory)
16.	DSC B7	Relational Database Management Systems I	50 (Theory)
17.	DSC B8	Relational Database Management Systems II	50 (Theory)
18.	AECC–B	Business Communication-II	50 (Theory)

Practical (Annual)

BCA Part-I: Sem-I & II : List of Courses

Discipline Specific Core (DSC) Courses

Course code	Name of the Course	Course code	Name of the Course
BCA Part-I: Sem-I DSC : A1 to A8		**BCA Part-I: Sem-II DSC : B1 to B8**	
DSC A1	Fundamentals of Computer I	DSC B1	Operating System I
DSC A2	Fundamentals of Computer II	DSC B2	Operating System II
DSC A3	Programming with C I	DSC B3	Data Structures using C I
DSC A4	Programming with C II	DSC B4	Data Structures using C II
DSC A5	Basics of Mathematics I	DSC B5	Basics of Electronics I
DSC A6	Basics of Mathematics II	DSC B6	Basics of Electronics II
DSC A7	Office Automation I	DSC B7	Relational Database Management Systems I
DSC A8	Office Automation II	DSC B8	Relational Database Management Systems II
AECC–A	Business Communication-I	AEC-C B	Business Communication II

DSC: Discipline Specific Core Course

AECC – Ability Enhancement Compulsory Course

Choice Based Credit System with Multiple Entry and Multiple Exit Option
(NEP-2020)
BCA PART I SEM I

Course code: DSC–A1

Title of course: Fundamentals of Computer I

Theory: 32 Hrs (40 lecturers of 48 minutes)

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   **(16 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   **(16 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

Choice Based Credit System with Multiple Entry and Multiple Exit Option
(NEP-2020)
BCA PART I SEM I

Course code: DSC–A2

Title of course: Fundamentals of Computer II

Theory: 32 Hrs (40 lecturers of 48 minutes)

Marks: 50 (Credit: 02)

Course Outcomes:

The course will enable students to;

1. Understand concept of Hardware & Software
2. Understand fundamental concept of UNIX/Linux

UNIT I   (16 HOURS)

Number Systems: Binary, Octal and Hexadecimal, Conversion from one base to another, Introduction to software, Definition of Software, Types of Software-System software, Application software and Utility software. Computer Languages, Types: Low Level (Machine, Assembly), High level Language, their features, advantages and disadvantages, Generation of Programming language: First (Machine), Second (Assembly), Third (High level-Procedure and object oriented like C, C++, java), Fourth generation (database programming and scripting perl, php), Features of Language, Language Translator: Types (Assembler, Compiler, Interpreter) and their functions

UNIT II   (16 HOURS)

Introduction to Operating System, Meaning and Definition, Logical Architecture of a Computer System, Functions of Operating System, Booting of OS & it's types, Types of Operating System, Introduction to Linux, History and development of Linux, Features and Advantages of Linux, Concept of shell and its types, kernel, Kernel-shell relationship, Concept of file, types, file system tree, Different GPU (cal, date, echo, printf, bc, script, passwd, who, man)

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

Choice Based Credit System with Multiple Entry and Multiple Exit Option (NEP-2020)

BCA PART I SEM I

Course code: DSC–A3

Title of course: Programming with C I

Theory: 32 Hrs (40 lecturers of 48 minutes)

Marks: 50 (Credit: 02)

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   (16 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 Associatively, Expression Evaluation, Type conversions

UNIT II   (16 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

Choice Based Credit System with Multiple Entry and Multiple Exit Option (NEP-2020)
BCA PART I SEM I

Course code: DSC–A4

Title of course: Programming with C II

Theory: 32 Hrs (40 lecturers of 48 minutes)

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   **(16 HOURS)**

Functions: Introduction to Structured Programming, Functions- basics, user defined functions, inter function communication (call by value, call by reference), Standard functions. Storage classes-auto, register, static, extern, scope rules, arrays to functions, recursive functions, example C programs.

UNIT II   **(16 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

Choice Based Credit System with Multiple Entry and Multiple Exit Option (NEP-2020)

BCA PART I SEM I

Course code: DSC–A5

Title of course: Basics of Mathematics I

Theory: 32 Hrs (40 lecturers of 48 minutes)

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 (16 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 II (16 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
4. Matrices by Shantinarayan

Choice Based Credit System with Multiple Entry and Multiple Exit Option

(NEP-2020)

BCA PART I SEM I

Course code: DSC–A5

Title of course: Basics of Mathematics II

Theory: 32 Hrs (40 lecturers of 48 minutes)

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   **(16 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   **(16 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, R

Choice Based Credit System with Multiple Entry and Multiple Exit Option
(NEP-2020)
BCA PART I SEM I

Course code: DSC–A7

Title of course: Office Automation I

Theory: 32 Hrs (40 lecturers of 48 minutes)

Marks: 50 (Credit: 02)

Course Outcomes:

After completion of this course students will be able to;

1. Understand the basics of MS Word
2. Understand the functionalities of MS Excel

UNIT I   (16 HOURS)

MS Word: Working with Documents -Opening & Saving files, Editing text documents, Inserting, Deleting, Cut, Copy, Paste, Undo, Redo, Find, Search, Replace, Formatting page & setting Margins, Converting files to different formats, Importing & Exporting documents, 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

UNIT II   (16 HOURS)

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, Converting files to different formats (importing, exporting, sending files to others), 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 (Addition, Subtraction, Multiplication, Division, Exponentiation), Using other Formulae. Formatting Spreadsheets

Reference Books:

1. Microsoft Word 2010: Level 2, by Judy Mardar and Pamela R. Toliver
2. Excel 2016 Bible 1st Edition by John Walkenbach

Choice Based Credit System with Multiple Entry and Multiple Exit Option
(NEP-2020)
BCA PART I SEM I

Course code: DSC–A8

Title of course: Office Automation II

Theory: 32 Hrs (40 lecturers of 48 minutes)

Marks: 50 (Credit: 02)

Course Outcomes:

After completion of this course students will be able to;

1. Understand the working of PowerPoint
2. Understand the uses of internet and email

UNIT I   (16 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.

UNIT II   (16 HOURS)

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, downloading and uploading the website; 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. PowerPoint For Dummies, Office 2021 Edition 1st Edition by Doug Lowe
2. Introduction to Information Technology - Alexis Leon, Mathews Leon, and Leena Leon, Vijay Nicole Imprints Pvt. Ltd., 2013.
3. Computer & Internet Basics Step-by-Step - Etc-end the Clutter - Infinity Publishing

Choice Based Credit System with Multiple Entry and Multiple Exit Option
(NEP-2020)
BCA PART I SEM I

Course code: AECC–A

Title of course: Business Communication-I

Theory: 32 Hrs (40 lecturers of 48 minutes)

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   **(16 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   **(16 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, grapewine, 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

Choice Based Credit System with Multiple Entry and Multiple Exit Option
(NEP-2020)
BCA PART I SEM II

Course code: DSC B1

Title of course: Operating System I

Theory: 32 Hrs (40 lecturers of 48 minutes)

Marks: 50 (Credit: 02)

Course Outcomes:

After completion of this course students will be able to;

1. Understand fundamental operating system
2. Define different OS design techniques
3. Distinguish main memory and virtual memory

UNIT I   **(16 HOURS)**

Evolution of Operating Systems: Types of operating systems - Different views of the operating systems – Principles of Design and Implementation. The process concept – system programmer's view of processes – operating system's views of processes – operating system services for process management. Process scheduling – Schedulers – Scheduling Algorithms,

UNIT II   **(16 HOURS)**

Introduction to Processes, Process Model, Process creation, Process termination, Process hierarchy, Process states. Introduction to memory management, Requirements (Relocation, Protection, Sharing, Logical organization, Physical organization). Memory partitioning- Fixed partitioning, Dynamic partitioning Paging, Segmentation, Concept of Virtual memory.

Reference Books:

1. Operating Systems by Flynn, McHoes, Cengage Learning
2. Modern Operating Systems by Andrew S Tanenbaum
3. Operating Systems by Pabitra Pal Choudhury,
4. Operating System Concepts by Abraham Silberschatz, Peter Baer Galvin, Greg Gagne

Choice Based Credit System with Multiple Entry and Multiple Exit Option
(NEP-2020)
BCA PART I SEM II

Course code: DSC B2
Title of course: Operating System II
Theory: 32 Hrs (40 lecturers of 48 minutes)
Marks: 50 (Credit: 02)

Course Outcomes:

After completion of this course students will be able to;

1. Understand the concept of concurrency control
2. Understand various Memory Management techniques

UNIT I   (16 HOURS)

Files & File system, The File structure, File types, File access, File attributes, Basic file operations. Directories- Single-level & Hierarchical directory systems Path names & Directory operations, Differentiate between Windows and Linux OS, Processes and Threads, Concept of Multithreading, Types of Threads, Scheduling, Types of Scheduling, Scheduling Algorithms, and Thread Scheduling.

UNIT II   (16 HOURS)

Process/thread Synchronization and Mutual Exclusion: Principles of Concurrency, Requirements for Mutual Exclusion, Mutual Exclusion: Hardware Support, Operating System Support (Semaphores and Mutex), Programming Language Support (Monitors). Classical synchronization problems: Readers/Writers Problem, Producer and Consumer problem, Inter process communication. Deadlock: Principles of Deadlock, Deadlock Modeling, Strategies to deal with deadlock: The Ostrich Algorithm, Deadlock Prevention, Deadlock Avoidance, Deadlock detection and recovery, An Integrated Deadlock Strategy, Example: Dining Philosophers Problem.

Reference Books:

1. Operating Systems by Flynn, McHoes, Cengage Learning
2. Modern Operating Systems by Andrew S Tanenbaum
3. Operating Systems by Pabitra Pal Choudhury,
4. Operating System Concepts by Abraham Silberschatz, Peter Baer Galvin, Greg Gagne

Choice Based Credit System with Multiple Entry and Multiple Exit Option (NEP-2020)

BCA PART I SEM II

Course code: DSC B3

Title of course: Data Structures using C I

Theory: 32 Hrs (40 lecturers of 48 minutes)

Marks: 50 (Credit: 02)

Course Outcomes:

After completion of this course students will be able to;

1. Implementation of Linked Lists.

2. Implementing various data structures using Stacks, Queues

UNIT I   (16 HOURS)

Data, Data Types, abstract Data type, Data Structure, Arrays as abstract data types (1D, 2D, Multidimensional) Linked lists: Concepts, Operations: Insert, Delete, Traversal, Static implementation using arrays, Dynamic implementation, doubly linked lists, Circular lists, Linked lists applications, Polynomial representation

UNIT II   (16 HOURS)

Stack: Concepts push and pop operations, Stack implementation using C, Stacks as linked lists, Stack Applications, conversion of infix expression to postfix and prefix expressions, Expression evaluation, Recursion. Queues: Concept, insert, And delete operations, Queue implementation using C, queues as linked lists, deque, priority queues , Applications of queue

Reference Books:

1. Data structure Through C In Depth by S. K. Srivastav

2. Classic data Structures by Samantha

3. Data Structures Using C by Yashwant Kanitkar

4. Introduction to Data Structures using C by Ashok Kamthane

5. Data Structures using C by Bandopadhyay and Dey

Choice Based Credit System with Multiple Entry and Multiple Exit Option
(NEP-2020)
BCA PART I SEM II

Course code: DSC B4
Title of course: Data Structures using C II
Theory: 32 Hrs (40 lecturers of 48 minutes)
Marks: 50 (Credit: 02)

Course Outcomes:

After completion of this course students will be able to;

1. Implementation of trees
2. Implementing various sorting techniques and graphs

UNIT I **(16 HOURS)**

Trees: Terminology and concepts, Binary trees representation, Static implementation using arrays Linked representation, binary search tree, Operation inserts and Delete, Tree Traversal- (Preorder, Inorder, Postorder), Representing trees as binary Trees, Height balanced trees (AVL tree), B Trees.

UNIT II **(16 HOURS)**

Sorting: Concepts and needs, Bubbles, Quick, Selection, Insertion, Tree (Heap), Merge, Radix sort.

Graphs: Graph terminology, Representation of graphs, path matrix, BFS, DFS

Reference Books:

1. Data structure Through C In Depth by S. K. Srivastav
2. Classic data Structures by Samantha
3. Data Structures Using C by Yashwant Kanitkar
4. Introduction to Data Structures using C by Ashok Kamthane

   Data Structures using C by Bandopadhyay and Dey

Choice Based Credit System with Multiple Entry and Multiple Exit Option
(NEP-2020)
BCA PART I SEM II

Course code: DSC B5

Title of course: Basics of Electronics I

Theory: 32 Hrs (40 lecturers of 48 minutes)

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   (16 HOURS)

Number Systems & Binary Codes : Introduction to Decimal, Binary, Hexadecimal Number system ,Interconversion from one system to Another (examples),code, Gray code, Exess-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   (16 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 Inter conversion 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 Fundamaentals by FLOYD & JAIN, Pearsons Pub

4. Fundamentals of Logic Design by Charles H. Roth Thomson

Choice Based Credit System with Multiple Entry and Multiple Exit Option (NEP-2020)

BCA PART I SEM II

Course code: DSC B6

Title of course: Basics of Electronics II

Theory: 32 Hrs (40 lecturers of 48 minutes)

Marks: 50 (Credit: 02)

Course Outcomes:

After completion of this course students will be able to;

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

UNIT I   **(16 HOURS)**

Combinational Circuits: Introduction, Half adder, Full adder, Half & Full Subtractor, Parallel adder, Universal Adder & Subtractor , Encoder (decimal-BCD), priority encoder, Decoder (BCD-Decimal), 3x4 matrix keyboard encoder , Multiplexer and De-multiplexer, Study of IC 74153, 74151,7447,74138 ,74139,74148 etc.

UNIT II   **(16 HOURS)**

Sequential Circuits: Concept of sequential circuits ,Flip-flops : RS, Clocked RS, Latch, D (edge triggered), JK, Master-Slave JK in detail (including advantages, drawbacks & applications) PRESET & CLEAR in Flip-flop, Counter-synchronous, asynchronous (up to 4-bit) ,up-down counter (3-bit), Modulus-N counter, applications of counter ,Construction of mod-5, mod-10 counter, Shift Register: SISO,SIPO, PISO, PIPO, Ring counter, Johnson counter (4-bits) Study of IC 7495,7490

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

Choice Based Credit System with Multiple Entry and Multiple Exit Option
(NEP-2020)
BCA PART I SEM II

Course code: DSC B7

Title of course: Relational Database Management Systems I

Theory: 32 Hrs (40 lecturers of 48 minutes)

Marks: 50 (Credit: 02)

Course Outcomes:

After completion of this course students will be able to;

1. Explain basic database concepts, applications, data models, schemas and instances
2. Describe the fundamental elements of relational database management systems

UNIT I **(16 HOURS)**

Introduction: Introduction and applications of DBMS, Purpose of data base, Data, Independence, Database System architecture- Levels, Mappings, Database, users and DBA Database Design: Database Design Process, ER Diagrams - Entities, Attributes, Relationships, Constraints, keys, extended ER features, Generalization, Specialization, Aggregation, Conceptual design with the E-R model, Advantages and disadvantages of the DBMS, DBMS users, Database administrator, Role of DBA

UNIT II **(16 HOURS)**

Basics of SQL, DDL, DML, DCL, structure – creation, alteration, defining constraints – Primary key, foreign key, unique, not null, check, In operator, Functions - aggregate functions, Built-in functions – numeric, date, string functions, set operations, sub-queries, correlated sub-queries, Use of group by, having, order by, join and its types, Exist, Any, All , view and its types.

Reference Books:

1. SQL The Complete Reference by James Groff , Paul Weinberg , Andy Oppel
2. Database Management Systems by Rajiv Chopra
3. Database System Concepts by Abraham Silberschatz, Henry F. Korth, S. Sudarshan
4. An introduction to Database Systems by Bipin C. Desai

Choice Based Credit System with Multiple Entry and Multiple Exit Option (NEP-2020)

BCA PART I SEM II

Course code: DSC B8

Title of course: Relational Database Management Systems II

Theory: 32 Hrs (40 lecturers of 48 minutes)

Marks: 50 (Credit: 02)

Course Outcomes:

After completion of this course students will be able to;

1. Explain the basic concepts of relational data model, entity-relationship model, relational database design, relational algebra and SQL.
2. Improve the database design by normalization.

UNIT I   **(16 HOURS)**

Introduction to schema refinement, functional dependencies, reasoning about FDs. Normal forms: 1NF, 2NF, 3NF, BCNF, properties of decompositions, normalization, schema refinement in database design, Relational Algebric Operations: Select, Project, Union, Difference, Intersection, Cartesian Product, Natural Join.

UNIT II   **(16 HOURS)**

Introduction to Transaction Processing; Transaction and System Concepts; Desirable Properties of Transactions; Characterizing Schedules Based on Recoverability; Characterizing Schedules Based on Serializability. Stored procedures - introduction, creating, modifying, executing and dropping procedures - Stored functions – introduction, creating, modifying, executing and dropping functions - Database triggers – introduction, creating, modifying and dropping triggers, types of triggers.

Reference Books:

1. SQL The Complete Reference by James Groff , Paul Weinberg , Andy Oppel
2. Database Management Systems by Rajiv Chopra
3. Database System Concepts by Abraham Silberschatz, Henry F. Korth, S. Sudarshan
4. An introduction to Database Systems by Bipin C. Desai

Choice Based Credit System with Multiple Entry and Multiple Exit Option (NEP-2020)

BCA PART I SEM II

Course code: AECC B

Title of course: Business Communication II

Theory: 32 Hrs (40 lecturers of 48 minutes)

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   (16 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   (16 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