Estd. 1962
"A++" Accredited by NAAC(2021) With CGPA 3.52

SHIVAJI UNIVERSITY, KOLHAPUR - 416004, MAHARASHTRA
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शिवाजी विद्यापीठ, कोल्हापूर - ४१६००४,महाराष्ट्र
दूरध्वनी - ईपीएबीएक्स - २६०९०००, अभ्यासमंडळे विभाग दुरध्वनी विभाग २३१–२६०९०९३/९४

SU/BOS/Science/ 72 **Date: 15 / 11 / 2022**

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

Subject :- Regarding syllabi of M. Sc. & B. Sc. 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 **M. Sc. & B. Sc. Part -I** 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. Computer Science (Online Mode दुरशिक्षण केंद्र)
		B. Sc. Part -I Computer Science (Entire)
		B. Sc. Part -I Computer Science (Optional)
		B. Sc. Part - I Information Technology

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.

Accredited By NAAC with 'A++' Grade

Choice Based Credit System with Multiple Entry and Multiple Exit Option

(NEP-2020)

CHOICE BASED CREDIT SYSTEM

Syllabus for

B. Sc. Part – I

INFORMATION TECHNOLOGY ENTIRE

SEMESTER I AND II

(Syllabus to be implemented from Academic Year 2022-23)

Choice Based Credit System with Multiple Entry and Multiple Exit Options

To be implemented from the Academic Year 2022-23

First Year Bachelor of Science IT (Entire) (Level-5) Programme Structure (NEP-2020 PATTERN)

Courses	Sr. No.	Course Code	TEACHING SCHEME						EXAMINATION SCHEME						
			THEORY			PRACTICAL			THEORY				PRACTICAL		
			Credits	No. of lectures	Hours	Credits	No. of lectures	Hours	Hours	Max	Total Marks	Min	Hours	Max	Min
SEMESTER – I (Duration–6 Months)															
CGPA COURSES	1	DSC-101	2	5	4	2	4	3.2	2	50	100	35	PRACTICAL EXAMINATION IS ANNUAL		
	2	DSC-102	2						2	50					
	3	DSC-103	2	5	4	2	4	3.2	2	50	100	35			
	4	DSC-104	2						2	50					
	5	DSC-105	2	5	4	2	4	3.2	2	50	100	35			
	6	DSC-106	2						2	50					
	7	DSC-107	2	5	4	2	4	3.2	2	50	100	35			
	8	DSC-108	2						2	50					
	9	AECC- A1	2	4	3.2	1	2	1.6	2	50	50	18			
		TOTAL(A)	18			9	18				450				
NonCGPA	10	SEC-1	-	-	-	2	4	4							
	11	VBC-1				1	2	2							
SEMESTER– II (Duration–6 Months)															
CGPA COURSES	1	DSC-201	2	5	4	2	4	3.2	2	50	100	35	As per BOS Guide-lines	50	18
	2	DSC-202	2						2	50					
	3	DSC-203	2	5	4	2	4	3.2	2	50	100	35		50	18
	4	DSC-204	2						2	50					
	5	DSC-205	2	5	4	2	4	3.2	2	50	100	35		50	18
	6	DSC-206	2						2	50					
	7	DSC-207	2	5	4	2	4	3.2	2	50	100	35		50	18
	8	DSC-208	2						2	50					
	9	AECC- B1	2	4	3.2	1	4	3.2	2	50	50	18		50	18
		TOTAL (B)	18			9					450			250	
		TOTAL(A+B)	36			18					900				
NonCGPA	10	SEC-2	-	-	-	2	4	4							
	11	VBC-2				1	2	2							

- Student contact hours per week: 32Hrs (Minimum)
- Total Marks for B.Sc.- I : 1150
- Theory and Practical Lecture Duration: 48 min each
- Total Credits for B.Sc.-I(Sem I&II): 60
- Practical Examination will be conducted annually for 50 marks per course.
- **DSC**: Discipline Specific Core Course
- **AECC:** Ability Enhancement Compulsory Course(A&B):English for communication
- **SEC:** Skill Enhancement Course (Vocational Studies): Field Projects/ Internship/ Apprenticeship/ Community Engagement and Service. Any one from pool of courses. For SEC courses there shall be only practical examination of 50 marks. **VBC:** Value Based Course(NSS/NCC/Sports/Cultural, etc.)
- Except English,there shall be combined passing for two theory courses of 50 marks each.i.e.minimum 35 marks are required for passing out of 100.There shall be separate passing for theory and practical.

- ***Exit option after Level 5: Students can exit with Certificate Course in Science (with the completion of courses equal to minimum of 60 credits).***

B. Sc. Part – I: Information Technology (Entire) Sem I and Sem II:

List of Courses

Discipline Specific Core (DSC) Courses

Course code	Name of the Course	Course code	Name of the Course
B.Sc. Part-I: Sem-I and Sem II DSC: Sem I-A1toA8 & Sem-II B1 to B8			
DSC-101	Fundamentals of Computer Part-I	**DSC-201**	Fundamentals of Computer Part-II
DSC-102	Database Management System Part-I	**DSC-202**	Database Management System Part-II
DSC-103	Programming Using 'C'Part-I	**DSC-203**	Programming Using 'C'Part-II
DSC-104	Office Automation Part-I	**DSC-204**	Office Automation Part-II
DSC-105	Electronics Paper-I	**DSC-205**	Electronics Paper-III
DSC-106	Electronics Paper-II	**DSC-206**	Electronics Paper-IV
DSC-107	Mathematics Paper-I	**DSC-207**	Mathematics Paper-III
DSC-108	Mathematics Paper-II	**DSC-208**	Mathematics Paper-IV
AECC–A1	English Paper–I	**AECC–B1**	English Paper–II
Lab-I	Lab course-I Based on DSC-102, 104 and DSC-202, 204		
Lab-II	Lab course-II Based on DSC-103 and DSC-203		
Lab-III	Lab course-III Based on CC-104 and CC-204		
Lab-IV	Lab course-IV Based on CC-105 and CC-205		
Lab-V	Lab course-V Based on AECC-A1 and AECC-B1		

Link forthepool of SEC courses from National Skills Qualification Framework (NSQF)

(You may add or delete any courses as per available facilities)

https://drive.google.com/file/d/176Vwvx4SC2ONrt69XADruzI2qnfBPI_o/view?usp=sharing

B. Sc. Part – I: Information Technology (Entire) Sem (I and II):

Title of the Course	Information Technology
Year of Implementation	Revised Syllabus will be implemented from June 2022-23 0nwards.
Duration	Part- I shall be of one academic year consisting of two semesters.
Pattern	Semester Pattern

STRUCTURE OF THE COURSE

Code	Paper	Name of the Paper	Marks
Semester -I			
Information Technology			
DSC-101	Paper-I	Fundamentals of Computer Part-I	50
DSC-102	Paper-II	Database ManagementSystem Part-I	50
DSC-103	Paper-III	Programming Using 'C'Part-I	50
DSC-104	Paper-IV	Office Automation Part-I	50
Electronics			
DSC-105	Paper-I	Analog Electronics Circuits-I	50
DSC-106	Paper-II	Digital Integrated Circuits I	50
Mathematics			
DSC-107	Paper-I	Foundation of Mathematics	50
DSC-108	Paper-II	Algebra	50
English			
AECC–A1	Paper-I	English for Communication Part-I	50
Semester -II			
Information Technology			
DSC-201	Paper-V	Fundamentals of Computer	50
DSC-202	Paper-VI	Database ManagementSystem Part-II	50
DSC-203	Paper-VII	Programming Using 'C'Part-II	50
DSC-204	Paper-VIII	Office Automation Part-II	50
Electronics			
DSC-205	Paper-III	Analog Electronics Circuits-II	50
DSC-206	Paper-IV	Digital Integrated Circuits II	50
Mathematics			
DSC-207	Paper-III	Foundation of Mathematics Part-II	
DSC-208	Paper-IV	Graph Theory	
English			
AECC–B1	Paper-II	English for Communication Part-II	50
Practical (Annual Pattern)			
Lab-I	Lab course-I Based on DSC-102, 104 and DSC-202, 204		100
Lab-II	Lab course-II Based on DSC-103 and DSC-203		100
Lab-III	Lab course-III Based on CC-104 and CC-204		100
Lab-IV	Lab course-IV Based on CC-105 and CC-205		100
Lab-V	Lab course-IV Based on AECC-A1 and AECC-B1		50

B. Sc. Part- I Information Technology (Entire)(Semester I)

Course Code: DSC 101: Computer Paper-I

Course Title: Fundamentals of Computer Part-I

Total Contact Hours: 36 hrs (45 lectures of 48 min)

Credits: 02 Teaching Scheme: Theory – 03 Lect. / Week Total Marks: 50

Unit-I: Introduction to Computer and Basic Organization:- (18 Hours)

Definition of computer, characteristics, limitations, concepts of h/w and s/w, Evolutions, generations, classification based on size and Purpose, applications of computers in various fields, computer languages
– highlevel, low level, assembly level, compiler, interpreter. Block diagram of computer system, Input-output devices, Primary Memory – RAM, ROM, EPROM, PROM, Cache, EEPROM. Secondary Storage devices: - Magnetic disk, Magnetic tape, Optical disk -CD ROM. Algorithms and flowchart

Unit -II: Introduction to Computer Software:- (18 Hours)

Introduction to Computer Software: Computer Software, Overview of different operating systems, Overview of application software, proprietary software and open source technology. Types and working of Hardware Parts – Motherboard, Ports & SMPS. Types of buses-Address bus, Data bus. Basic Input and Output Settings (BIOS), Network Interface Card (NIC) , Graphic Card. Network protocols-HTTP, FTP, TCP/IP.

Reference Books:

1. Computer Today- S. Basndara
2. Computer Fundamentals- P. K. Sinha
3. Computer Fundamentals- V. Rajaraman
4. Introduction to Computer and Data Processing- Pawar, Lad, Shinde, Patil (Dreamtech)

B. Sc. Part- I Information Technology (Entire)(Semester I)

Course Code: DSC 102: Computer Paper-II

Course Title: Database Management System Part-I

Total Contact Hours: 36 hrs (45 lectures of 48 min)

Credits: 02 Teaching Scheme: Theory – 03 Lect. / Week Total Marks: 50

Unit-I: Database Management System: - (18 Hours)

Introduction, Basic Concept and Definitions, Data and Information, Data Vs. Information, Data Dictionary, Data Item or Field, Record, Definition of DBMS, Applications of DBMS, File processing system Vs. DBMS,Advantages and Disadvantages of DBMS, Users of DBMS

Unit-II: Data Model :- (18 Hours)

Relational Model, Network Model, Hierarchical Model,Relational Model : Relation , Tuple , Attribute , Cordinality, Degree of relationship set,Domain,Relational Algebra Operations : Select, Project, Union, Difference, Intersection, Cartesian Product, SQL (Structured Query Language), History of SQL, Basic Structure, Data Types and Operators : Logical, Relational, Between, Like, DDL Commands and DMLCommands ,Simple Queries

Reference Books:

1. R. Elmasri, S.B. Navathe, Fundamentals of Database Systems 6th Edition, PearsonEducation, 2010.
2. R. Ramakrishanan, J. Gehrke, Database Management Systems 3rd Edition, McGraw-Hill,2002.
3. Silberschatz, H.F. Korth, S. Sudarshan, Database System Concepts 6th Edition,McGraw Hill, 2010.
4. R. Elmasri, S.B. Navathe Database Systems Models, Languages, Design and applicationProgramming, 6th Edition, Pearson Education,2013.

B. Sc. Part- I Information Technology (Entire)(Semester I)

Course Code: DSC 103: Computer Paper-III

Course Title: Programming Using 'C' Part-I

Total Contact Hours: 36 hrs (45 lectures of 48 min)

Credits: 02 Teaching Scheme: Theory – 03 Lect. / Week Total Marks: 50

Unit-I: Basics of Programming and Introduction to 'C':- (18 Hours)

Problem definition, problem analysis, Algorithms, flow chart, History of 'C', Character set and keywords,Constant and its type, Variable and Data types in 'C'.
Operators- Arithmetic, logical, relational, bitwise, increment, decrement, conditional, operator precedenceStructure of 'C' programming, Running and debugging the 'C' program.
Types of errors in C programming Input-Output Statements in C-Character input-output - getch(), getche(), getchar(), putchar(),String input-output
- gets(), puts(),Formatted input-output - printf(), scanf()

Unit-II: Control Statements and Array:- (18 Hours)

Branching Statements -Introduction, if statement, if-else statement, Nested If-else, Switch case statement.
Looping Statements - Definition of Loop.
•Types of looping statement.- for statement, nested for, while, do-while statements, Difference between whileloop and do—while Loop,
•Unconditional control statements- break, continue, goto
•Infinite Loop.
Definition and declaration of array.
Array definition and declaration, initialization and Memory representation of array.Types of Array- One, two and multidimensional arrays.
String handling functions- strcpy(), strcmp(), strcat(), strlen(), strrev()), strupr(), strlwr() etc.

Reference Books:

1. Programming in ANSI C - E. Balagurusamy
2. Programming in C – Schuam outline Series
3. Let Us C – YashwantKanetkar
4. Introduction to Programming Using C- A. J Pawar, R. A. Lad, S. S. Shinde, D. R.Patil (Wiley Dreamtech)
5. The complete reference 'C' – Herbert Schildt
6. Programming in C by D Ravichandran.
7. C Programming by Venugopal.
8. The C Programming Language- By Ritchie and Kernighan

B. Sc. Part- I Information Technology (Entire)(Semester I)

Course Code: DSC 104: Computer Paper-IV

Course Title: Office Automation Part-I

Total Contact Hours: 36 hrs (45 lectures of 48 min)

Credits: 02 Teaching Scheme: Theory – 03 Lect. / Week Total Marks: 50

Unit-I: INTRODUCTION TO MS EXCEL: (18 Hours)

Create a workbook ▪ Import data from a delimited text file ▪ Add a worksheet to an existing workbook ,Copy and move a worksheet, Search for data within a workbook, Navigate to a named cell, range, or workbook element ,Insert and remove hyperlinks Configure Worksheets and Workbooks for Distribution, Inspect a workbook for hidden properties or personal information, Inspect a workbook for accessibility issues ▪ Inspect a workbook for compatibility issues, Summarize Data by using Functions, Perform Conditional Operations by using Functions, Format and Modify Text by using Functions, .Create and Manage PivotTables.

Unit-II: INTRODUCTION TO MS WORD:- (18 Hours)

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, Sending files to others, Using Tool bars, Ruler, Using Icons, using help, 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 -

Formatting Page, Page tab, Margins, Layout settings, Paper tray, Border & Shading, Columns, Header & footer, Setting Footnotes & end notes – Shortcut Keys; Inserting manual page break, Column break and line break, Creating sections & frames, Anchoring & Wrapping, Setting Document styles, Table of Contents, Index, Page Numbering, date & Time, Author etc., Creating Master Documents, Web page.

Creating Tables- Table settings, Borders, Alignments, Insertion, deletion, Merging, Splitting, Sorting, and Formula, Drawing - Inserting ClipArts, Pictures/Files etc., Tools – Word Completion, Spell Checks, Mail merge, Templates, Creating contents for books, Creating Letter/Faxes.

Reference Books:

1) Microsoft Office 2007 Bible - John
2) Walkenbach,HerbTyson,FaitheWempen,caryN.Prague,MichaelR.groh, PeterG.Aitken, and Lisa a.Bucki -Wiley India pvt.ltd.
3) Introduction to Information Technology - Alexis Leon, Mathews Leon,and Leena Leon, Vijay Nicole Imprints Pvt. Ltd., 2013.
4) A Conceptual Guide to OpenOffice
5) Computer & Internet Basics Step-by-Step - Etc-end the Clutter -Infinity Publishing
6) Open Office Basic: An Introduction

B. Sc. Part- I Information Technology (Entire)(Semester I)

Course Code: DSC 105: Electronics Paper-I

Course Title: Analog Electronics Circuits-I

Total Contact Hours: 36 hrs. (45 lectures of 48 min)

Credits: 02 Teaching Scheme: Theory – 03 Lect. / Week Total Marks: 50

Unit- I: Electronics components and Semiconductor Devices

Resistors: Classification, Discussion on carbon composition resistor, color code, specifications of resistors,
Capacitors: Classification, construction of electrolyte capacitor, Inductors: types of inductors, types of transformers
Semiconductor Devices: p-n junction diode-construction and VI characteristics (Forward and Reverse biased), Zener and avalanche breakdown, Zener diode, Photo diode. Light Emitting Diode (LED).

Unit-II: Network Theorems and Circuit Analysis

(A) Networks Theorem: Ohm's Law, Kirchhoff's Current Law (KCL), Kirchhoff's Voltage Law (KVL). Superposition Theorem. Thevenin's Theorem. Norton's Theorem. Maximum Power Transfer Theorem. Two Port Networks: h, y and z parameters and their conversion.
(B) Rectifiers- Half wave rectifier, Full wave rectifiers (center tapped and bridge), circuit diagrams, working and waveforms, ripple factor and efficiency. Filter: Shunt capacitor filter, its role in power supply, Output waveform and working.
(C) Regulation- Line and load regulation, Zener diode as voltage regulator, and explanation for load and line regulation.

Reference Books:

- A Textbook of Applied Electronics: R. S. Sedha, S. Chand Publications
- Electronic Devices and Circuits: Allen Mottershed
- Basic Electronics and linear circuits: Bhargava- Gupta, TMH
- Electric Circuits, S. A. Nasar, Schaum's outline series, Tata McGraw Hill (2004)
- Electronic Devices and Circuits, David A. Bell, 5th Edition 2015, Oxford University Press.
- Electronic Circuits: Discrete and Integrated, D.L. Schilling and C. Belove, TMH Electrical Circuit Analysis, Mahadevan and Chitra, PHI Learning
- Microelectronic circuits, A.S. Sedra, K.C. Smith, A.N. Chandorkar, 2014, 6th Edn., Oxford University Press.

B. Sc. Part- I Information Technology (Entire)(Semester I)

Course Code: DSC 106: Electronics Paper-II

Course Title: Digital Integrated Circuits I

Total Contact Hours: 36 hrs. (45 lectures of 48 min)

Credits: 02 Teaching Scheme: Theory – 03 Lect. / Week Total Marks: 50

Unit 1: Number System and Digital Signals: - (18 hours)

(A) Number System and Codes: Decimal, Binary, Octal and Hexadecimal number systems, base conversions. Representation of signed and unsigned numbers, BCD, ASCII codes. Binary and Hexadecimal arithmetic; Addition, subtraction by 2's complement method.

(B) Logic Gates and Boolean algebra: Truth Tables of OR, AND, NOT, NOR, NAND, XOR, XNOR, Universal Gates, Active high and active low signals, Basic postulates and fundamental theorems of Boolean algebra. De-Morgan's Theorems

Unit 2: Logic Gates and Digital Circuits: (18 hours)

(A) Combinational Logic Analysis and Design: Standard representation of logic functions (SOP and POS), Minimization Techniques (Karnaugh map minimization up to 4 variables for SOP).
(B) Arithmetic Circuits: Binary Addition. Half and Full Adder. Half and Full Subtractor, 4-bit binary Adder/Subtractor ALU.
(C) Data processing circuits: Multiplexers, De-multiplexers, Decoders, Encoders.

Reference Books:

- Digital Principles and Applications, A.P. Malvino, D.P.Leach and Saha, 7th Ed., 2011, Tata McGraw
- Fundamentals of Digital Circuits, Anand Kumar, 2nd Edn, 2009, PHI Learning Pvt. Ltd.
- Digital Circuits and systems, Venugopal, 2011, Tata McGraw Hill.
- Digital Systems: Principles & Applications, R.J.Tocci, N.S.Widmer, 2001, PHI
- Thomas L. Flyod, Digital Fundamentals, Pearson Education Asia (1994)

B. Sc. Part- I Information Technology (Entire)(Semester I)

Course Code: DSC 107: Mathematics Paper-I

Course Title: Foundation of Mathematics

Total Contact Hours: 36 hrs. (45 lectures of 48 min)

Credits: 02 Teaching Scheme: Theory – 03 Lect. / Week Total Marks: 50

Unit- I: Matrices: -

Adjoint of matrix, Inverse of Matrix, Application of matrices to a system of liner homogeneous and Nonhomogeneous equations. Eigen values and Eigen vectors.

Unit- II : Successive Differentiation:-

2.1. n^{th} order derivative of some standard functions : (i) $(ax + b)^n$,
(ii) $\frac{1}{ax + b}$
(iii) Log $(ax = b)$, (iv) e^{ax} , (v) a^{mx} , (vi) $\sin(ax + b)$, (vii) $\cos(ax + b)$,
(viii) $e^{ax} \sin(bx + c)$, (ix) $e^{ax} \cos(bx + c)$.2.2.leibnitz's theorem and it's applications

Unit- III: Mean Value Theorems: -

Introduction, Rolle's theorem, Geometrical Interpretation of Rolle's theorem, Lagrange's mean value theorem.,Geometrical Interpretation of Lagrange's mean value theorem, Cauchy's mean value theorem, Geometrical Interpretation of Cauchy's mean value theorem.

Unit-IV: Partial Differentiation:-

Introduction, Partial derivative of first order, Partial derivative of Higher orders, Homogeneous functions, Euler's on homogeneous functions.

Reference Books:

1. Shanti Narayan : Differential Calculus.
2. S.B. Nimse : Calculus
3. H.T.Dinde, A.D. Lokhande, P.D.Sutar, U.H.Nai: A Text Book Of Calculus AndDifferential Equations, Published by SUMS, 2003. 4.R.B.Kulkarni,J.D.Yadhav,N.I.Dhanshetti:ATextBookOfAlgebraAndGeometry

B. Sc. Part- I Information Technology (Entire)(Semester I)

Course Code: DSC 108: Mathematics Paper-II

Course Title: Algebra

Total Contact Hours: 36 hrs. (45 lectures of 48 min)

Credits: 02 Teaching Scheme: Theory – 03 Lect. / Week Total Marks: 50

Unit I: Relations (18 Hours)

Ordered pairs, Cartesian product ,Relations, Types of relations, Equivalence relation, Partialordering relation ,Examples Digraphs of relations, matrix representation and composition of Relations , Examples Transitive closure, Warshall's algorithm , Examples Equivalence class, Partition of a set

Unit II: Divisibility of integers (18 Hours)

Introduction ,Divisibility : Division algorithm (Statement only)
Greatest Common Divisor (GCD),Least Common Multiple (LCM)
Euclidean algorithm(Statement only)
Prime numbers, Euclides Lemma, Fundamental theorem ofArithmetic (without proof)
Congruence relation and its properties
Fermat's Theorem (Statement only).
Examples.Residue Classes: Definition, Examples, addition modulo n ,multiplication modulo n.

Unit III: Boolean algebra (12 Hours)

Lattice: Definition, principle of duality
Basic properties of algebraic systems defined by Lattices
Distributive and complemented lattices
Boolean lattices and Boolean algebras Boolean expressions and Boolean functions

Reference Books

1. Algebra by S.R.Patil and Others Nirali Prakashan.
2. Algebra by Bhopatkar, Nimbkar, Joglekar, VISION Publication.
3. Algebra by Naik and Patil, PHADAKE Prakashan

B. Sc. Part- I Information Technology (Entire)(Semester I)

Course Code: AECC–A1: English Paper-I

Course Title: English for Communication Part-I

Total Contact Hours: 36 hrs. (45 lectures of 48 min)

Credits: 02 Teaching Scheme: Theory – 03 Lect. / Week Total Marks: 50

Course Objectives:

1. To acquaint students with communication skills.
2. To inculcate human values among the students through poems and prose.
3. To improve the language and business competence of the students.

Module I

A) Developing Vocabulary
B) Technology with a Human Face – E.F. Schumacher
C) How Beautiful - P. K. Padhy

Module II

A) Narration
B) As a Flower I Come - by Sundaram

Module III

A. Description
B. I Have a Dream - Martin Luther King

Module IV

A) The Auspicious Vision- Tagore
B.) The Book - Iftikar Rizvi

B. Sc. Part- I Information Technology (Entire)(Semester II)

Course Code: DSC 201: Computer Paper-V

Course Title: Fundamentals of Computers Part-II

Total Contact Hours: 36 hrs (45 lectures of 48 min)

Credits: 02 Teaching Scheme: Theory – 03 Lect. / Week Total Marks: 50

Unit –I: Internet: - (18 hours)

Concept of Internet, Uses and benefits, Internet Service Providers, DNS Servers, Connection Types, Modems, Origins and Development of the Internet; How Internet Standards are Developed; Moving Data acrossthe Internet: Internet Addresses, Overview of World Wide Web (Web Server and Client) Introduction to Searchengine and Searching the Web Downloading files Introduction to Web Browsers Working with E-mail (creation and use of the same) Internet Security , Virus, Antivirus

Unit -II: Operating System concepts :- (18 hours)

Definition and Functions of O.S. Types of O.S. –Single user, Multi-user. Process Management- Multiprogramming, Multitasking, Multiprocessing, Time sharing. Disk Operating System (DOS), DOS internaland external commands, concept of directory and file. Windows Operating system : Features of Windows O.S.,GUI Modules of Windows – Windows Explorer, Control panel, Printer Manager. Windows accessories – Paintbrush, Notepad.

References:

1. Operating System-Achyut Godbole
2. Lecture Notes On Operating Systems- Mrs. Sk Abeeda

B. Sc. Part- I Information Technology (Entire)(Semester II)

Course Code: DSC 202: Computer Paper-VI

Course Title: Database Management System Part-II

Total Contact Hours: 36 hrs (45 lectures of 48 min)

Credits: 02 **Teaching Scheme: Theory – 03 Lect. / Week** **Total Marks: 50**

Unit-I: SQL Joins,Views,Data Constraints :-(18 hours)

Primary Key, Unique Key, Foreign Key, Not Null , Check and Default,SQL Clauses:Where, Order by, Group by , Having,Nested Queries,Aggregate Functions:SUM, MAX, MIN, COUNT, AVG.Functions – String Functions (concat, instr, left, right, mid, length, lcase/lower,ucase/upper, replace, strcmp, trim, ltrim, rtrim), Math Functions (abs, ceil, floor,mod, pow, sqrt, round, truncate) Date Functions (adddate, datediff, day, month,year, hour, min, sec, now, reverse),Normalization :Normal Form : 1 NF, 2 NF, 3 NF, 4 BCNF

Unit-II: Introduction PL-SQL :-(18 hours)

Structure of PL SQL Block, Control Structure : If Statement , case statement, Loops (Simple Loop, For ,While), Comparison between SQL and PLSQL, Simple Queries on PL-SQLReference

Books:

1. R. Elmasri, S.B. Navathe, Fundamentals of Database Systems 6th Edition, PearsonEducation, 2010.
2. R. Ramakrishanan, J. Gehrke, Database Management Systems 3rd Edition, McGraw-Hill,2002.
3. Silberschatz, H.F. Korth, S. Sudarshan, Database System Concepts 6th Edition,McGraw Hill, 2010.
4. R. Elmasri, S.B. Navathe Database Systems Models, Languages, Design and applicationProgramming, 6thEdition,PearsonEducation,2013.

B. Sc. Part- I Information Technology (Entire)(Semester II)

Course Code: DSC 203: Computer Paper-VII

Course Title: Programming Using 'C' Part-II

Total Contact Hours: 36 hrs (45 lectures of 48 min)

Credits: 02 Teaching Scheme: Theory – 03 Lect. / Week Total Marks: 50

Unit -I: User Defined Functions and Pointer: User Defined Functions :- (18 hours)

Definition, declaration, prototype of function Local and global variable,User defined functionscategory of a functions, functions with array,Recursion, Storage classes- auto, external, Static and register.

Pointer -Pointer Definition, Declaration and Pointer Initialization,Pointer arithmetic, Pointer of Pointer.Arrays of Pointers,Pointers and One and two dimensional Arrays,pointer and functionsFunction Callby value and call by reference Dynamic Memory Allocation

Unit- II: Structure, Union and File Handling:- (18 hours)

Structure Definition and declaration of structure,Nested Structure, Array of structures, structure pointer,Passing structure to function,**Union** Definition and declaration, of union Difference between Structure and Union,**File Handling** Concept of File, Text and binary files, File opening mode, File Opening and closingfiles-fopen() and fclose().File opening mode- read, write, append Reading and writingstring function gets(),puts()),Formatted input- scanf(), sscanf(),fscanf(), fread(), Formatted output,fwrite(). Functions-fseek(), ftell(), rewind().

Reference Books:

1. Programming in ANSI C - E. Balagurusamy
2. Programming in C – Schuam outline Series
3. Let Us C – YashwantKanetkar
4. Introduction to Programming Using C- A. J Pawar, R. A. Lad, S. S. Shinde, D. R.Patil (Wiley Dreamtech)
5. The complete reference 'C' – Herbert Schildt
6. Programming in C by D Ravichandran.
7. C Programming by Venugopal.

B. Sc. Part- I Information Technology (Entire)(Semester II)

Course Code: DSC 204: Computer Paper-VIII

Course Title: Office Automation Part-II

Total Contact Hours: 36 hrs (45 lectures of 48 min)

Credits: 02 Teaching Scheme: Theory – 03 Lect. / Week Total Marks: 50

Unit 1: INTRODUCTION TO OPEN OFFICE – WRITER: (18 Hours)

What is Writer? The Writer interface, Changing document views, Moving quickly through a document, Working with documents, Using built-in language tools, Working with text, Formatting text, Formatting pages, Adding comments to a document, Creating a table of contents, Creating indexes and bibliographies, Working with graphics, Printing, Using mail merge, Tracking changes to a document, Using fields Linking and cross-referencing within a document, Using master documents, Classifying document contents, Creating fill-in forms

Unit 2: INTRODUCTION TO POWER POINT: (18 Hours)

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, Drawing Pictures using Draw. Adding Effects to the Presentation- Setting Animation & transition effect. Printing Handouts, Generating Standalone Presentation viewer. Open Office-Impress - Introduction – Creating Presentation, Saving Presentation Files, Master Templates & Re-usability, Slide Transition, Making Presentation CDs, Printing Handouts – Operating with MS Power Point files / slides

Websites: 1) http://windows.microsoft.com/en-in/windows/msoffice-basics-all- topics

2) https://wiki.openoffice.org/wiki/Documentation 15. https://documentation.libreoffice.org/assets/Uploads/Documentation/en/GS6.0/ GS60-GettingStartedLO.pdf

B. Sc. Part- I Information Technology (Entire)(Semester II)

Course Code: DSC 205: Electronics Paper-III

Course Title: Analog Electronics Circuits-II

Total Contact Hours: 36 hrs. (45 lectures of 48 min)

Credits: 02 Teaching Scheme: Theory – 03 Lect. / Week Total Marks: 50

Unit- I: Transistor and Amplifiers (18 hours)

(A) BJT: Structure and working of bipolar junction transistor: CB, CC, CE configurations, CE mode characteristics, Concept of transistor as an amplifier and transistor as a switch.Regions of operation (active, cut off and saturation), Current gains α andβ. Relations between α and β. dc load line and Q point.

(B) Amplifiers: Transistor biasing and Stabilization circuits- Fixed Bias and Voltage Divider Bias. Thermal runaway, stability and stability factor S. Transistor as Two port network, DC analysis of CE amplifier: Input, output Impedance, Current & voltage gains.

Class A, B and C Amplifiers

(C) Cascaded Amplifiers: Coupling Methods (RC, DC & TC) Two stage RC Coupled Amplifier and its Frequency Response.

Unit- II: Oscillators and Semiconductor Devices (18 hours)

(A) Feedback in Amplifiers: Concept of feedback, negative and positive feedback, advantages of negative feedback (Qualitative only).

(B) Sinusoidal Oscillators: Barkhausen criterion for sustained oscillations. Colpitt's and Phase shift oscillator: Determination of Frequency and Condition of oscillation. Crystal Oscillator.

(C) Unipolar Devices: JFET. Construction, working and I-V characteristics (output and transfer), Pinch-off voltage. UJT: Basic construction, working, equivalent circuit and I-V characteristics.

Reference Books:

- A Textbook of Applied Electronics: R. S. Sedha, S. Chand Publications
- Electronic Devices and Circuits: Allen Mottershed
- Basic Electronics and linear circuits: Bhargava- Gupta, TMH
- Electric Circuits, S. A. Nasar, Schaum's outline series, Tata McGraw Hill (2004)
- Electronic Devices and Circuits, David A. Bell, 5th Edition 2015, Oxford University Press.
- Electronic Circuits: Discrete and Integrated, D.L. Schilling and C. Belove, TMH
- J. Millman and C. C. Halkias, Integrated Electronics, Tata McGraw Hill (2001)

B. Sc. Part- I Information Technology (Entire)(Semester II)

Course Code: DSC 206: Electronics Paper-IV

Course Title: Digital Integrated Circuits II

Total Contact Hours: 36 hrs. (45 lectures of 48 min)

Credits: 02 Teaching Scheme: Theory – 03 Lect. / Week Total Marks: 50

Unit 1: Sequential and Combinational Circuits (18 hours)

(A) Sequential Circuits: SR, D, and JK Flip-Flops. Clocked (Level and Edge Triggered) Flip-Flops. Preset and Clear operations. Racearound conditions in JK Flip-Flop. Master-slave JK Flip-Flop.

(B)Shift registers: Serial-in-Serial-out, Serial-in-Parallel-out, Parallelin-Serial-out and Parallel-in-Parallel-out Shift Registers (only up to 4 bits).

(C) Counters (4 bits): Ring Counter. Asynchronous counters, Decade Counter. Synchronous Counter. UP/DOWN Counter.

(D)Data Conversion: DAC: performance characteristics,4 bit binary weighted and R-2R circuit and working. Accuracy and Resolution.

ADC: performance characteristics, successive approximation ADC, Dual slope ADC (Mention of relevant ICs for all).

Unit 2:Multivibrator, Memory Devices and Memory Organization (18 hours)

(A) Multivibrator: Types of multivibrators, IC 555: block diagram and applications, Astable, Monostable and Bistable multivibrator: circuit diagram and waveforms (calculation of frequency and pulse width)

(B) Memory Devices and memory organization:

Types of memory – volatile and non-volatile, SRAM and DRAM, classification and working principle of memory devices; RAM, ROM, EPROM, EEPROM, UVEPROM, Flash RAM

(C) Concept of Diode Matrix ROM, speed and cost range of memory devices, memory organization – building the required memory size by using available memory chips, memory address map

Reference Books:

- Digital Principles and Applications, A.P. Malvino, D.P.Leach and Saha, 7th Ed., 2011, Tata McGraw
- Fundamentals of Digital Circuits, Anand Kumar, 2nd Edn, 2009, PHI Learning Pvt. Ltd.
- Digital Circuits and systems, Venugopal, 2011, Tata McGraw Hill.
- Digital Systems: Principles & Applications, R.J.Tocci, N.S.Widmer, 2001, PHI
- Thomas L. Flyod, Digital Fundamentals, Pearson Education Asia (1994)
- R. L. Tokheim, Digital Principles, Schaum's Outline Series, Tata McGraw- Hill (1994)

B. Sc. Part- I Information Technology (Entire)(Semester II)

Course Code: DSC 207: Mathematics Paper-III

Course Title: Foundation of Mathematics Part-II

Total Contact Hours: 36 hrs. (45 lectures of 48 min)

Credits: 02 Teaching Scheme: Theory – 03 Lect. / Week Total Marks: 50

Unit-I: Number System and Digital Signals:- (11 Hours)

Introduction, Errors, Absolute Error, Relative Error, Percentage Error, Solution to Algebraic and Transcendental Equations, Bisection Method, Method of False Position, Newton – Raphson Method

Unit-II: Interpolation :- (11 Hours)

Introduction, Forward Difference, Backward Difference, Newton's Forward Difference Interpolation,Newton's Backward Difference Interpolation, Lagrange's Interpolation.
Least – Square Curve Fitting Method, Fitting a straight line, Fitting parabola.

Unit-III: Solution of Simultaneous Algebraic Linear Equations :- (11 Hours)

Cramer's Rule, Gauss Elimination Method, Gauss – Jordan Method, Gauss – Seidel Method.

Unit-IV: Numerical Solution of Ordinary Differential Equations & Numerical Integration:- (12 Hours)

Numerical solution of 1st and 2nd order differential equations, Taylor Series, Euler's Method, Euler's Modified Method, Runge – Kutta Method (2nd, 4th order)

Reference Books:

1. S.S. Sastry: Introduction Methods of Numerical Analysis, PHI.
2. V. Rajaraman: Computer Oriented Numerical Methods.
3. Balguruswami: Numerical Methods, PHI.
4. Mathews: Numerical Methods for Scientist & Engineers, PHI.
5. S.S. Sastry: Introduction Methods of Numerical Analysis, PHI.
6. Steven C: Numerical Methods for Engineers with programming and Software Applications.

B. Sc. Part- I Information Technology (Entire)(Semester II)

Course Code: DSC 208: Mathematics Paper-IV

Course Title: Graph Theory

Total Contact Hours: 36 hrs. (45 lectures of 48 min)

Credits: 02 Teaching Scheme: Theory – 03 Lect. / Week Total Marks: 50

Unit-1 Graphs and operations on graphs (12 Hours)

Definition and elementary results, Types of graphs, Isomorphism, Matrix representation of graphs : Adjacency matrix and incidencematrix, Subgraphs and induced graphs, Complement of a graph, Self complementary graphs, Union, intersection of graphs, Ring sum of two graphs

Unit-2 Connected Graphs (12 Hours)

Definitions: walk, trail, tour, path and circuit, Definitions of connected, disconnected graphs

Dijkstra's shortest path algorithm, Connectivity: Isthumus, cut-vertex, Edgeconnectivity & vertex connectivity.

Unit-3 Tree Graphs (12 Hours)

Tree : Definition, Theorem : A tree with n vertices has n -1 edges.Theorem : A connected graph G with n vertices and n - 1edges is a tree, Theorem : A graph with n vertices is a tree if and only if it is circuit

free and has n - 1 edges,Theorem : A graph G is a tree if and only if it is minimallyconnected.

Centre of a tree, Spanning tree: Definition and examples, Fundamental circuit and cut - set : Definition Binary trees and elementary results, Kruskal's algorithm.

Reference Books

1. Elements of Discrete Mathematics by C.L. Liu
2. Discrete Mathematical Structure for Computer Science by Alan Doer & K.Levasicur.
3. Discrete and Combinatorial Mathematics by R.m. Grassl
4. Discrete Mathematics by Kenneth Rosen,Tata McGraw Hill
5. Graph Theory with Applications to Computer Sc. & Engg. By Narsing Deo, PHI
6. A First Step in Graph Theory by Raghunathan, Nimkar and Solapurrkar
7. Discrete mathematics by S.R.Patil and others, NIRALI Prakashan.
8. Discrete mathematics by Bhopatkar, Nimbkar, Joglekar, VISION Publication.

Discrete mathematics by Naik and Patil, PHADAKE Prakashan

B. Sc. Part- I Information Technology (Entire)(Semester II)

Course Code: AECC–B1: English Paper-II

Course Title: English for Communication Part-II

Total Contact Hours: 36 hrs. (45 lectures of 48 min)

Credits: 02 Teaching Scheme: Theory – 03 Lect. / Week Total Marks: 50

Course Objectives:

1. To acquaint students with communication skills.
2. To inculcate human values among the students through poems and prose.
3. To improve the language and business competence of the students.

Module V

A) Telephonic Communication
B) Lost Forest - Johannes Jensen
C) Stopping by Woods - Robert Frost

Module VI

A) English for Spesific Purposes
B) Putting Data to Effective Use - Satish Tripathi

Module VII

A) English for Advertising
B) An Epithet- W.H.Davies

Module VIII

A) The Golden Touch -Nathaniel Howthone
B) Offering in the Temple -Desika Vinayakam Pillai

Lab course-I Based on DSC-102, 104 and DSC-202, 204

Note: MySQL may be used.
The following concepts must be introduced to the students:
DDL Commands

- Create table, alter table, drop tableDML Commands
- Select, update, delete, insert statements
- Condition specification using Boolean and comparison operators (and, or,not,=,<>,>,<,>=,<=)
- Arithmetic operators and aggregate functions(Count, sum, avg, Min, Max)
- Multiple table queries (join on different and same tables)
- Nested select statements
- Set manipulation using (any, in, contains, all, not in, not contains, exists, not exists, union,intersect, minus, etc.)
- Categorization using group by having
- Arranging using order by

1. For given scenario Draw E-R diagram and convert entities and relationships to table.
2. Write relational algebra queries on the tables created in Practical-1.
3. Perform the following:
   Viewing all databases , Creating a Database, Viewing all Tables in a Database, Creating Tables (With and Without Constraints) Inserting/Updating/Deleting Records in a Table, Saving (Commit) and Undoing (rollback)
4. Perform the following:
   Altering a Table, Dropping/Truncating/Renaming Tables, Backing up / Restoring a Database
5. Perform the following:
   Simple Queries, Simple Queries with Aggregate functions, Queries with Aggregate functions (group by and having clause)
6. ViewsCreating Views (with and without check option) ,Dropping views
   Selecting from a view
7. Inner Join outer Join
8. Simple PL-SQL Blocks

Note:
The practical examination is annual having 100 marks and 4 hours duration. There are four questions and student has to attempt any two. The mark distribution is as follows.
Solved question carries: 80 marks (Each question carries 40 x 2=80 Marks) Certified journal carries: 10 marks.
Viva based on practical carries: 10 marks.

Lab course-II Based on DSC-103 and DSC-203

Practical using 'C'

Programming.

1. Write a program to accept 'n' subject marks and calculate total marks, percentageand grade of student.
2. Write a program to input n numbers and find the Odd and Even numbers.
3. Write a program to find an age of a person (Input birth date and today date).
4. Write a program to input the day number and display day of week.
5. Write a program to find the sum of first n natural numbers.
6. Write a program to accept the range and generate Fibonacci Series.
7. Write a program to find prime numbers between given range.
8. Write a program to sort the numbers in ascending and descending order using array.
9. Write a program to accept any string and check given string is Palindrome or not (UseString functions).
10. Write a program to find the product of given two matrices. 11 Write a program to find multiplication table of given number.

12. Write a program to create a function to find the given number is Armstrong or not.
13. Write a recursive function to find the factorial of a given number.
14. Write a function to sort given names in ascending order.
15. Write a program to create strcpy() function using pointer.
16. Write a program to create function to swap two numbers (Call by reference).
17. Write a program to demonstrate the Pointer Arithmetic (increment, decrement, addition, subtraction).
18. Write a program to create Structure and accept values for its member's and display it.
19. Write a program to demonstrate Structure within structure, accept values for its member's and display thesame.
20. Write a program to create Structure Student (roll_no, name, marks) accepts values for 3 records anddisplays the same (array of structure).
21. Write a program to create Union and accept values for its member's and display it.
22. Write a program to create file with name "Test.txt" and read and write characters from/in the file.
23. Write a program to create file with name "Sample.txt" and read and write string from/in the file.
24. Write a program to create file and read and write student data (Roll No, Name, Marks) from/in the fileusing fscanf() and fprintf() functions.
25. Write a program to demonstrate the use of fseek(), ftell() and rewind() functions.

Note:

The practical examination is annual having 100 marks and 4 hours duration. There are four questions andstudent has to attempt any two. The mark distribution is as follows.

Solved question carries:80 marks (Each question carries 40X2=80 Marks)Certified journal carries: 10 marks.
Viva based on practical carries: 10 marks.

ELECTRONICS LAB
Semester- I
Group- A (At least 08 experiments)
Credits: 02 Hours: 30

Any 06 from the followings Hardware circuits

1. To familiarize with basic electronic components (R, C, L, diodes, transistors), Digital Multimeter, Function Generator, power supplies and Oscilloscope etc.
2. Measurement of Amplitude, Frequency & Phase difference using Oscilloscope.
3. Study of the I-V Characteristics of (a) p-n junction Diode, and (b) Zener diode.
4. Study of Full wave rectifier.
5. To verify the Thevenin and Superposition Theorems
6. Study of Logic Gates.
7. Study of Universal Gates
8. Study of De-Morgans Theorems.
9. Half Adder and Subtractor
10. Full Adder and Subtractor (using 7483 & 7404)
11. Study of Encoder & seven segment Decoder.
12. Study of Multiplexer (4 :1) and Demultiplexer (1 :4)

Any 02 from the following's computer simulations

1. Study the effect of (a) C- filter and (b) Zener regulator on the output of FWR
2. To verify the Norton and Maximum power Transfer Theorems.
3. Design and analyze the series and parallel LCR circuits
4. Study any Boolean expression using K-map.

ELECTRONICS LAB
Semester- II
Group- B (At least 08 experiments)
Credits: 02 Hours: 30

Any 06 from the followings Hardware circuits

1. To build and test Flip-Flop (RS, Clocked RS, D).
2. To make a Shift Register (serial-in and serial-out) using D-type/JK Flip-Flop ICs
3. Design a digital to analog converter (DAC) of given specifications.
4. To design an Astable Multivibrator of given specification using IC 555 Timer.
5. To design a Monostable Multivibrator of given specification using IC 555 Timer.
6. Design a Colpitt's oscillator of given frequency.
7. Study of the output and transfer I-V characteristics of common source JFET
8. Design of a Single Stage CE amplifier of given gain & study frequency response.

Any 02 from the following's computer simulations

1. To study the zero-crossing detector and comparator.
2. Design clocked SR and JK Flip-Flop`s using Gates.
3. Design 4-bit asynchronous counter using Flip-Flop ICs.
4. Design a SAR type ADC of given specifications.

Lab course-IV Based on DSC-105 and DSC-205

Mathematics Practical – I & II

1. Examples on equivalence relation
2. Euclid's algorithm, Division algorithm
3. Fermat's theorem on remainder
4. Warshall's algorithm

Sr. No.	Topics	No. of Experiments
1	Inverse of Matrix by ad joint method	**1**
2	Solution of system of m liner homogeneous equations in n-unknowns	**1**
3	Solution of system of m linear non-homogeneous equations in n-unknowns	**1**
4	Eigen values and Eigen vectors	**1**
5	Solution of Non-linear equations – (a) Bisection Method (b) Method of False Position (c) Newton-Raphson Method	**3**
6	Interpolation – (a) Newton's Forward Difference Interpolation (b) Newton's Backward Difference Interpolation (c) Lagrange's Interpolation (d) Fitting a curve by Least square method-St. Line, Parabola	**4**
Sr. No.	**Topics**	**No. of Experiments**
7	Solution of Simultaneous Algebraic Linear Equations (a) Gauss Elimination Method (b) Gauss – Jordan Method (c) Gauss – Seidel Method	3
8	Numerical solution of Ordinary Differential Equations (a) Euler' Method (b) Euler's Modified Method (c) Runge – Kutta Method (2^{nd} , 4^{th} order)	3
9	Numerical Integration (a) Trapezoidal Rule. (b) Simpson's 7 Rule (c) Simpson's 3/8 Rule	3

Lab course-V Based on AECC-A1 and AECC-B1

Communication Skill Development

1. Interview Skills (10M)
2. Group Discussion (10M)
3. Letter writing (10M)
4. Speech (10M)
5. E-Communication (10M)