माँ शाकुम्भरी विश्वविद्यालय, सहारनपुर

Maa Shakumbhari University, Saharanpur

Syllabus

Bachelor of Computer Application
(BCA)

For

Affiliated Colleges

Maa Shakumbhari University, Saharanpur

From the Session 2023-24

(Prof. Karamjit Bhatia) (Prof. Mahesh Kumar) (Prof. Naveen Kumar Sharma)

(Dr. Jay Prakash) (Prof. Praveen Kumar)

Course Objective

BCA is an undergraduate academic degree program that is focused on providing students with a strong foundation in computer science and applications. The program is designed to provide students with a comprehensive understanding of computer science, software development, and computer applications.

The duration of the BCA program is three years, and it is divided into six semesters. The course curriculum of BCA includes subjects such as computer programming, data structures, algorithms, software engineering, computer networks, database management systems, web development, and computer graphics.

The program also includes practical sessions, lab assignments, and project work to provide hands-on experience to the students. The objective of the BCA program is to prepare students for a career in the field of computer science and technology.

After completing the BCA program, students can pursue higher education in the field of computer science or technology, or they can start their career as a software developer, web developer, database administrator, or IT consultant

Eligibility Criteria

10+2 With 45% (SC 40%) Marks in any discipline with Maths at 10th or 12^{th} Standard compulsory.

Year -I, Semester-I

Semester	Paper	Course Code	Course Title	Th/ Pr	Credits	(MM-100)		Min Marks	Min Marks
						IE	UE	UE	Total
BCA-1 SEM	1	0127001	Mathematical Foundation for Computer Science	TH	4	25	75	25	40
	2	0127002	Computer Fundamental & Office Automation	TH	4	25	75	25	40
	3	0127003	Programming in "C"	TH	4	25	75	25	40
	4	0127004	Digital Electronics & Computer Organization	TH	4	25	75	25	40
	5	0127005	Business Communication	TH	4	25	75	25	40
	6	0127080	C & OFFICE LAB	PR	4	-	100		40
	7	0120008	**Value added course** Environmental Studies	TH	2 Qualifying		100		33

Year- I, Semester-II

Semester	Paper	Course Code	Course Title	Th/ Pr	Credits	(MM-100)		Min Marks	Min Marks
						IE	UE	UE	Total
BCA-2 SEM	1	0227001	Mathematics-I	TH	4	25	75	25	40
	2	0227002	Advance C-Programming	TH	4	25	75	25	40
	3	0227003	Computer Architecture & Assembly language	TH	4	25	75	25	40
	4	0227004	Principle of Management	TH	4	25	75	25	40
	5	0227005	Financial Accounting with Tally	TH	4	25	75	25	40
	6	0227080	C Prog. & Tally LAB	PR	4	-	100		40

Year - 2, Semester-III

Semester	Paper	Course Code	Course Title	Th/ Pr	Credits	Evaluation (MM-100)		Min Marks	Min Marks
						IE	UE	UE	Total
BCA-3 SEM	1	0327001	Object Oriented Programming Using C++	TH	4	25	75	25	40
	2	0327002	Data Structure Using C & C++	TH	4	25	75	25	40
	3	0327003	Operating System concepts	TH	4	25	75	25	40
	4	0327004	Web Designing	TH	4	25	75	25	40
	5	0327005	Numerical Methods	TH	4	25	75	25	40
	6	0327080	Web Designing, C++ & DS LAB	PR	4	-	100		40

Year - 2, Semester – IV

Semester	Paper	Course Code	Course Title	Th/ Prac	Credits	Evaluation (MM-100)		Min Marks	Min Marks
						IE	UE	UE	Total
BCA-4 SEM	1	0427001	Web Development Using PHP	TH	4	25	75	25	40
	2	0427002	Introduction to Python	TH	4	25	75	25	40
	3	0427003	Software Engineering	TH	4	25	75	25	40
	4	0427004	Introduction to DBMS	TH	4	25	75	25	40
	5	0427005	Optimization Techniques	TH	4	25	75	25	40
	6	0427080	PHP, Python Prog. & DBMS LAB	PR	4	-	100		40

Year - 3, Semester - V

Semester	Paper	Course Code	Course Title	Th/ Prac	Credits	Evaluation (MM-100)		Min Marks	Min Marks
						IE	UE	UE	Total
BCA-5 SEM	1	0527001	Java Programming	TH	4	25	75	25	40
	2	0527002	Computer Network	TH	4	25	75	25	40
	3	0527003	Computer Graphics & Multimedia Application	TH	4	25	75	25	40
	4	0527004 0527005	**Elective –Any one of the following** **(A)** IT Trends & Technologies (B) Introduction to STATISTICS	TH	4	25	75	25	40
	5	0527065	Minor Project	PR	4	100			40
	6	0527080	Java & Computer Graphics LAB	P	4		100		40

Year - 3, Semester - VI

Semester	Paper	Course Code	Course Title	Th/ Pr	Credits	Evaluation (MM-100)		Min Marks	Min Marks
						IE	UE	UE	Total
BCA-6 SEM	1	0627001	Computer Network Security	TH	4	25	75	25	40
	2	0627002	Information System Analysis Design & Implementation	TH	4	25	75	25	40
	3	0627003	E-Commerce	TH	4	25	75	25	40
	4	0627004 0627005	**Elective – Any one of the following** (A)Cloud Computing (B)Data Ware Housing & Data Mining	TH	4	25	75	25	40
	5	0627065	Major Project	PR	8		100	40	40

Detail Syllabus(Semester-wise)

SEMESTER-I

Course Code	Course Name
0127001	Mathematical Foundation for Computer Science
0127002	Computer Fundamental and Office Automation
0127003	Programming in "C"
0127004	Digital Electronics & Computer Organization
0127005	Business Communication
0127080	C & Office Lab
0120008	Environmental Studies

Course Name: Mathematical Foundation for Computer Science

Course Code: 0127001 Internal/External Marks: 25/75 Credit: 4

UNIT-I

Matrix Theory Review of fundamentals, equivalent matrices, elementary row (column) operations, rank of a matrix by reducing it to the normal form, rank of a matrix by reducing it to echelon form.

UNIT-II

Mathematical Logic Connectives, Negation, Conjunction, Disjunction, conditional, bi-conditional, statement formulas, Tautology and contradiction, Equivalence formulae Normal forms: Principle conjunctive and disjunctive normal forms, Theory of inferences for statement calculus validating using truth tables.

UNIT-III

Graph Theory: Definition of a Graph, Finite and infinite Graphs, Incidence and Degree of a vertex, Null Graph, Sub graphs, Walks, Paths, Circuits, Connected, Disconnected graphs and Components, Euler Graph, Hamiltonian Path and Hamiltonian Circuits.

UNIT-IV

Trees and Matrix Representation: Properties of Trees, Distance and Centres in a Tree, Rooted and Binary Trees, Spanning Trees and Fundamental Circuits. Cutset, properties of a Cutset. Matrix Representation of graphs: Incidence matrix, Circuit matrix, Fundamental Circuit matrix, Cutset matrix, Path matrix, Adjacency matrix

Planar and Dual Graphs Planar Graphs, Kurtowski's two Graphs, Different Representations of a Planar Graph, Detection of Planarity.

UNIT-V

Directed Graphs: Definition, Some types of Digraphs, Digraphs and Binary relations, Directed paths and Connectedness, Euler Digraphs, Trees with directed edges, Fundamental Circuits in Digraphs, Adjacency Matrix of a Digraph**.**

Referential Books:

- Engineering Mathematics by H.C. Das, Chand publications.
- Graph theory – Narasingh Deo
- Discrete mathematical Structures by J.P. Trembley and R. Manohar, TMH Publications.
- Discrete Mathematics by Liu.
- BCA, Mathematics Vol-II G.K. Ranganath and B. Soorya Narayana.

Course Name: Computer Fundamental and Office Automation

Course Code: 0127002 Internal/External Marks: 25/75 Credit: 4

UNIT-I

Introduction to Computers

Introduction, Characteristics of Computers, Block diagram of computer. Types of computers and features, Mini Computers, Micro Computers, Mainframe Computers, Super Computers. Types of Programming Languages (Machine Languages, Assembly Languages, High Level Languages).Data Organization, Drives, Files, Directories. Types of Memory (Primary And Secondary) RAM, ROM, PROM, EPROM. Secondary Storage Devices (FD, CD, HD, Pen drive) I/O Devices (Scanners, Plotters, LCD, Plasma Display) Number Systems, Introduction to Binary, Octal, Hexadecimal system Conversion, Simple Addition, Subtraction, Multiplication

UNIT-II

Algorithm and Flowcharts

Algorithm: Definition, Characteristics, Advantages and disadvantages, Examples, Flowchart: Definition, Define symbols of flowchart, Advantages and disadvantages, Examples

UNIT-III

Operating System and Services in O.S.

DOS History, Files and Directories, Internal and External Commands, Batch Files, Types of Operative System.

UNIT-IV

Windows Operating Environment

Features of MS – Windows, Control Panel, Taskbar, Desktop, Windows Application, Icons, Windows Accessories, Notepad, Paintbrush.

UNIT-V

Editors and Word Processors

Basic Concepts, Examples: MS-Word, Introduction to desktop publishing.

UNIT-VI

Spreadsheets and Database packages

Purpose, usage, command, MS-Excel, Creation of files in MS-Access, Switching between application, MS-PowerPoint.

Referential Books:

- Fundamentals of computers-By P.K.Sinha.
- Fundamentals of computers-By V.Rajaraman B.P.B Publications
- M.S-Office 2000 – By Steve Sagman

Course Name: Programming in "C"

Course Code: 0127003 Internal/External Marks: 25/75 Credit: 4

UNIT-I

Introduction to 'C' Language History, Structures of 'C' Programming, Function as building blocks.

Language Fundamentals Character set, C Tokens, Keywords, Identifiers, Variables, Constant, Data Types, and Comments.

UNIT-II

Operators: Types of operators, Precedence and Associativity, Expression, Statement and types of statements

Build in Operators and function Console based I/O and related built in I/O function: printf(), scanf(), getch(), getchar(), putchar(); Concept of header files, Preprocessor directives: #include, #define.

UNIT-III

Control structures : Decision making structures: If, If-else, Nested If-else, Switch; Loop Control structures: While, Do-while, for, Nested for loop; other statements: break, continue, goto, exit

UNIT-IV

Simple Arithmetic Problems

Addition / Multiplication of integers, Determining if a number is +ve / -ve / even / odd, Maximum of 2 numbers, 3 numbers, Sum of first n numbers, given n numbers, Integer division, Digit reversing, Table generation for n, ab, Factorial, sine series, cosine series, nC_r , Pascal Triangle, Prime number, Factors of a number, Other problems such as Perfect number, GCD numbers etc (Write algorithms and draw flowchart), Swapping

UNIT-V

Functions

Basic types of function, Declaration and definition, Function call, Types of function, Parameter passing, Call by value, Call by reference, Scope of variable, Storage classes, Recursion.

Reference Books:

- Let us C-Yashwant Kanetkar
- Programming in C-Balguruswamy
- The C programming Lang., Pearson Ecl - Dennis Ritchie

Course Name: Digital electronics and Computer Organization

Course Code: 0127004 Internal/External Marks: 25/75 Credit: 4

UNIT-I

Logic gates and circuit

Gates (OR, AND, NOR, NAND, XOR & XNOR); Demogran's laws; Boolean laws, Circuit designing techniques (SOP, POS, K-Map).

UNIT-II

Combinational Building Blocks: Multiplexes; Decoder; Encoder; Adder and Subtracter.

UNIT-III

Memories

ROMs, PROMs, EPROMs, RAMs, Hard Disk, Floppy Disk and CD-ROM.

UNIT-IV

Sequential Building Blocks

Flip-Flop (RS, D, JK, Master-slave & & T flip-flops); Registers & Shift registers; Counters; Synchronous and Asynchronous Designing method.

UNIT-V

Memory Organization: Basic cell of static and dynamic RAM; Building large memories using chips; Associative memory; Cache memory organisation and Virtual memory organisation.

Referential Books:

- Digital Logic and Computer design (PHI) 1998 : M.M. Mano
- Computer Architecture (PHI) 1998 : M.M. Mano
- Digital Electronics (TMH) 1998 : Malvino and Leach
- Computer Organization and Architecture : William Stallings

Course Name: Business Communication

Course Code: 0127005 Internal/External Marks: 25/75 Credit: 4

UNIT-I

Means of Communication:

Meaning and Definition, Process, Functions, Objectives, Importance, Essentials of good communication, Communication barriers, 7C's of Communication

UNIT-II

Oral Communication:

Meaning, nature and scope, Principle of effective oral communication, Techniques of effective speech, Media of oral communication (Face -to-face conversation, Teleconferences, Press Conference, Demonstration, Radio Recording, Dictaphone, Meetings, Rumour, Demonstration and Dramatisation, Public address system, Grapevine, Group Discussion, Oral report, Closed circuit TV). The art of listening, Principles of good listening.

UNIT-III

Written Communication

Purpose of writing, Clarity in Writing, Principle of Effective writing, Writing Techniques, Electronic Writing Process.

UNIT-IV

Business Letters & Reports:

Need and functions of business letters – Planning & layout of business letter – Kinds of business letters – Essentials of effective correspondence, Purpose, Kind and Objective of Reports, Writing Reports.

UNIT-V

Drafting of business letters:

Enquiries and replies, Placing and fulfilling orders, Complaints and follow-up Sales letters, Circular letters Application for employment and resume

UNIT-VI

Information Technology for Communication:

Word Processor, Telex, Facsimile(Fax), E-mail, Voice mail, Internet, Multimedia, Teleconferencing, Mobile Phone Conversation, Video Conferencing, SMS, Telephone Answering Machine, Advantages and limitations of these types. Group Discussion, Mock Interview, Decision Making in a Group

Referential Books:

- Essentials of Business Communication, Rajendra Pal & J.S Korlahalli.
- Business Correspondence and Report Writing. R.C.Sharma & Krishna Mohan
- Communication Skill, R Dutta Roy & K.K.Dhir

Syllabus of Value Added Course in Environmental Studies for UG programmes

Course Title: Environmental Studies Credits-2

Max Marks: 100 Max Marks:100 Marks. Duration:2 Hrs

Learning objectives: This course attempts to create pro-environment attitude and a behavioral pattern in student community and society that attaches importance and priority to create sustainable life style and awareness on various environmental issues.

Learning outcomes: This course is expected to inculcate a critical thinking on various dimensions of environment through knowledge, skill, critical thinking and problem-solving

Unit 1: Understanding the Environment

1.1. Environment: concept, importance and components

1.2. Ecosystem: Concept and structure of Ecosystem

1.3 Functions of Ecosystem: Food chain, Food Web, Ecological Pyramids and Energy Flow

1.4. Ecosystem services: (Provisioning, regulating and cultural)

Unit 2: Natural resources and Environmental Pollution

2.1. Natural resources: Renewable and non-renewable (Global status, distribution and production)

2.2. Management of natural resources: Individual, community and government managed

2.3. Air, water and soil pollution: Causes, consequences and control

2.4. Solid waste management: Collection, segregation, transportation and disposal; 3R's

UNIT 3: Biodiversity and Issues in Environment

3.1 Concept of Biodiversity - levels, values and hot spots of Biodiversity

3.2 Threats to biodiversity and conservation of Biodiversity

3.3 Climate change, causes and consequences

3.4 Concept and objectives of Environmental Education, Environmental Ethics

UNIT-IV Introduction to Environment

4.1. Introduction to Environment, components of Environment and need of Environmental Education

4.2. Environmental Pollution-Types and effects on human beings and Environment

4.3. Human Population explosion and exploitation of Natural resources

UNIT V- Global Environmental issues

5.1. Global Warming and Climate Change, Ozone Depletion and Acid Rain.

5.2. Conventional and non-conventional Energy resources

5.3. Global Biodiversity loss and Species Extinction

Unit VI: Environmental law and policy

6.1 Constitutional provisions for environmental protection (article 21, 48A, 51A),

Environment Protection Act, 1986

6.2 The National Green Tribunal Act, 2010

6.3 National Environment Policy-2006

Unit VII: Environmental Protocols and Movements

7.1 Earth Summit and role of IPCC in Climate Change Monitoring

7.2 Kyoto Protocol and Montreal Protocol

7.3 Green Belt Movement and Chipko Movement

1. Suggested Reading:

1. Asthana, D. K. Text Book of Environmental Studies. S. Chand Publishing.
2. Basu, M., Xavier, S., Fundamentals Of Environmental Studies, Cambridge University Press, Basu, R. N. (Ed.) Environment. University of Calcutta, Kolkata.
3. Bharucha, E., Textbook of Environmental Studies for Undergraduate Courses. Universities Press.
4. Miller T.O. Jr., Environmental Science, Wadsworth Publishing Co. Wagner K.D. Environmental Management. W.B. Saunders Co. Philadelphia, USA
5. Conover, M. 2001 Resolving Human Wildlife Conflict, CRP Press.
6. Dickman, A.J.2010.Complexities of Conflict: the importance of considering social factors for effectively resolving human-wildlife conflict, Animal Conservation 13:458-466.
7. Thangavel, P. & Sridevi, G.2015.Environmental Sustainability: Role of Geen Technologies. Springer Publications.
8. Shastri, S.C. 2015, Environmental Law, Eastern Book Company.
9. Rao, M.N. &Datta, A.K. 1987. Waste Water Treatment. Oxford and IBH Publishing Co. Pvt.Ltd.
10. Raven, P.H., Hassenzahl, D.M. & Berg, L.R. 2012. Environment. 8th edition. John Wiley &Sons.
11. Rosencranz, A., Divan, S., & Noble, M. L. 2001. Environmental law and policy in India. Tripathi1992.
12. Sengupta, R. 2003. Ecology and economics: An approach to sustainable development. OUP.
13. Latifi, N.R., Akhter, S. 2022. Environmental Sciences, Wisdom Press.
14. Singh, J.S., Singh, S.P. and Gupta, S.R. 2014. Ecology, Environmental Science and Conservation. S. Chand Publishing, New Delhi.
15. Sodhi, N.S., Gibson, L. & Raven, P.H. (eds). 2013. Conservation Biology: Voices from the Tropics. John Wiley &Sons.

SCHEME OF EXAMINATION

The paper shall consist of 100 objective question of 100 marks. There are VII units in the syllabus paper setter have to take at least 10 question from each unit.

SEMESTER -II

Course Code	Course Name
0227001	Mathematics-I
0227002	Advance C-Programming
0227003	Computer Architecture & Assembly language
0227004	Principle of Management
0227005	Financial Accounting with Tally
0227080	C Prog. & Tally Lab

Course Name: Mathematics-I

Course Code: 0227001 Internal/External Marks: 25/75 Credit: 4

UNIT-I (SETS)

Sets, Subsets, Equal Sets Universal Sets, Finite and Infinite Sets, Operation on Sets, Union, Intersection and Compliments of Sets, Cartesian Product, Cardinality of Set, Simple Applications.

UNIT-II (RELATIONS AND FUNCTIONS)

Properties of Relations, Equivalence Relation, Partial Order Relation Function: Domain and Range, Onto, Into and One to One Functions, Composite and Inverse Functions, Introduction of Trigonometric, Logarithmic and Exponential Functions.

UNIT-III (PARTIAL ORDER RELATIONS AND LATTICES)

Partial Order Sets, Representation of POSETS using Hasse diagram, Chains, Maximal and Minimal Point, glb, lub, Lattices & Algebraic Systems, Principle of Duality.

UNIT-IV. (DETERMINANTS)

Definition, Minors, Cofactors, Properties of Determinants MATRICES: Definition, Types of Matrices, Addition, Subtraction, Scalar Multiplication and Multiplication of Matrices, Adjoint, Inverse, Cramers Rule, Rank of Matrix Dependence of Vectors, Eigen Vectors of a Matrix, Caley-Hamilton Theorem (without proof).

UNIT-V. (LIMITS & CONTINUITY)

Limit at a Point, Properties of Limit, Computation of Limits of Various Types of Functions, Continuity at a Point, Continuity Over an Interval, Intermediate Value Theorem, Type of Discontinuities

UNIT-VI. (DIFFERENTITION & INTEGRATION)

Derivative, Derivatives of Sum, Differences, Product & Quotients, Chain Rule, Derivatives of Composite Functions, Logarithmic Differentiation

Integral as Limit of Sum, Fundamental Theorem of Calculus (without proof.), Indefinite Integrals, Methods of Integration Substitution, By Parts.

Referential Books:

- S. Grewal, “Elementary Engineering Mathematics”, 34th Ed., 1998.
- Shanti Narayan, “Integral Calculus”, S. Chand & Company, 1999
- Kolman, Busby and Ross, “Discrete Mathematical Structure”, PHI, 1996.
- S.K.Sarkar,“Discrete Maths”; S. Chand & Co., 2000

Course Name: Advance C-Programming

Course Code: 0227002 Internal/External Marks: 25/75 Credit: 4

UNIT-I

Arrays : Definition, declaration and initialization of one dimensional array; Accessing array elements; Displaying array elements; Sorting arrays; Arrays and function; Two-Dimensional array: Declaration and Initialization, Accessing and Displaying, Memory representation of array [Row Major, Column Major]; Multidimensional array

UNIT-II

Pointers: Definition and declaration, Initialization; Indirection operator, address of operator; pointer arithmetic; dynamic memory allocation; arrays and pointers; function and pointers

UNIT-III

Strings: Definition, declaration and initialization of strings; standard library function: strlen(), strcpy(), strcat(), strcmp(); Implementation without using standard library functions

UNIT-IV

Structures : Definition and declaration ; Variables initialization; Accessing fields and structure operations; Nested structures; Union: Definition and declaration; Differentiate between Union and structure

UNIT-V

Introduction C Preprocessor: Definition of Pre-processor; Macro substitution directives; File inclusion directives; Conditional compilation

Bitwise Operators

Bitwise operators; Shift operators; Masks; Bit field

UNIT-VI

File handling: Definition of Files, Opening modes of files; Standard function: fopen(), fclose(), feof(), fseek(), fewind();Using text files: fgetc(), fputc(), fscanf() Command line arguments.

Referential Books:

- Let us C-Yashwant Kanetkar
- Programming in C-Balguruswamy
- The C programming Lang., Pearson Ecl - Dennis Ritchie

Course Name: Computer Architecture & Assembly Language

Course Code: 0227003 Internal/External Marks: 25/75 Credit: 4

UNIT-I

Basic computer organization and design, Instructions and instruction codes, Timing and control/ instruction cycle, Register/ Types of register/ general purpose & special purpose registers/ index registers, Register transfer and micro operations/ register transfer instructions, Memory and memory function, Bus/ Data transfer instructions, Arithmetic logic micro-operations/ shift micro- operations, Input/ Output and interrupts, Memory reference instructions, Memory interfacing memory/ Cache memory.

UNIT-II

Central Processing Unit: General Register Organization/ stacks organizations instruction formats, addressing modes, Data transfer and manipulation. Program control reduced computer, pipeline/ RISC/ CISC pipeline vector processing/ array processing.; Arithmetic Algorithms: Integer multiplication using shift and add, Booth's algorithm, Integer division, Floating-point representations.

UNIT-III

Computer Arithmetic: Addition, subtraction and multiplication algorithms, divisor algorithms. Floating point, arithmetic operations, decimal arithmetic operations, decimal arithmetic operations.

UNIT-IV

Input – Output Organization: Peripheral devices, Input/output interface, ALU Asynchronous Data transfer, mode of transfer, priority interrupts, Direct memory Address (DMA), Input/ Output processor (IOP), serial communication.

UNIT-V

Evaluation of Microprocessor: Overview of Intel 8085 to Intel Pentium processors Basic microprocessors, architecture and interface, internal architecture, external architecture memory and input/ output interface.

UNIT-VI

Assembly language, Assembler, Assembly level instructions, macro, use of macros in I/C instructions, program loops, programming arithmetic and logic subroutines, Input-Output programming.

Referential Books:

- Leventhal, L.A, "Introduction to Microprocessors", Prentice Hall of India . Mathur, A.P.,
- "Introduction to Microprocessors" , Tata McGraw Hill
- Rao,P.V.S., "Prospective in Computer Architechture" , Prentice Hall of India

Course Name: Principle of Management

Course Code: 0227004 Internal/External Marks: 25/75 Credit: 4

UNIT-I Nature of Management:

Meaning, Definition, it's nature purpose, importance & Functions, Management as Art, Science & Profession- Management as social System Concepts of management- Administration- Organization, Management Skills, Levels of Management.

UNIT-II Evolution of Management Thought:

Contribution of F.W.Taylor, Henri Fayol, Elton Mayo, Chester Barhard & Peter Drucker to the management thought. Business Ethics & Social Responsibility: Concept, Shift to Ethics, Tools of Ethics.

UNIT-III Functions of Management: Part-I

Planning – Meaning- Need & Importance, types, Process of Planning, Barriers to Effective Planning, levels – advantages & limitations. Forecasting- Need & Techniques

Decision making-Types - Process of rational decision-making & techniques of decision-making

Organizing – Elements of organizing & processes: Types of organizations, Delegation of authority – Need, difficulties Delegation – Decentralization

Staffing – Meaning & Importance, Direction – Nature – Principles, Communication – Types & Importance

UNIT-IV Functions of Management: Part-II

Motivation – Importance – theories

Leadership – Meaning –styles, qualities & function of leader Controlling - Need, Nature, importance, Process & Techniques, Total Quality Management Coordination – Need – Importance

UNIT – V

Management of Change: Models for Change, Force for Change, Need for Change, Alternative Change Techniques, New Trends in Organization Change, Stress Management.

UNIT-VI Strategic Management

Definition, Classes of Decisions, Levels of Decision, Strategy, Role of different Strategist, Relevance of Strategic Management and its Benefits, Strategic Management in India

Referential Books:

- Essential of Management - Horold Koontz and Iteinz Weibrich- McGrawhills International
- Management Theory & Practice - J.N.Chandan
- Essential of Business Administration - K.Aswathapa, Himalaya Publishing House
- Principles & practice of management - Dr. L.M.Parasad, Sultan Chand & Sons - New Delhi

Course Name: Financial Accounting with Tally

Course Code: 0227005 Internal/External Marks: 25/75 Credit: 4

UNIT-I

Basic Concepts of Accounting, Financial Statements, Financial Statement Analysis, Cost Centre, Basic concepts of Inventory Tally Configuration & INI setup, Data Directory & Folders configuration, Single & Multiple User, Tally Screen Components, Mouse / Keyboard Conventions & Key, Combinations, Switching between screen areas, Quitting Tally. Maintaining Company Data, Basic Company Details, Create/Alter/Select/Load/Close a Company, Chart of Accounts, Company Features, Configuration.

UNIT-II

Create, Alter & Display Groups and Ledgers, All accounting voucher types and transactions, Create and Alter new Voucher type, Item and Account Invoice transactions, Excise Invoice, Export Invoice, Transactions using Bill-wise details Create, Alter & Display Cost Centre and Cost Categories, Cost centre & Cost Category allocation in voucher entry, Creating Cost centre Class, Invoice entry in a Class situation, Create, Alter & Delete Foreign Currencies, Voucher entry using foreign currency, Bank Reconciliation, Interest calculations using simple & advance parameters, Interest calculations on outstanding balances & on invoices, Use of voucher class, adjustment of interest, Creation of voucher class, Invoice entry in a class situation.

UNIT-III

Create, Alter & Delete Budgets for groups, ledgers & cost centres, Defining credit limit & credit period, Display Budgets & variances, Create, Alter & Delete a scenario. Enabling Job Costing in Tally, Master creation & configuration for Job costing, Creation of Voucher type & Voucher class for Stock Transactions, Creation of Transfer journal for transfer of stock between Godowns, Consumption journal Transactions, payment voucher, Godown summary Report, Job Work Analysis, Material consumption summary. Reports like balance sheet, Profit & Loss account, Ratio analysis, Trial Balance. Accounts books like cash/bank book, All ledgers, Group summary & vouchers, Sales, purchase & journal registers, Cost centre & category summary, Cost centre breakup, ledger & group breakup, outstanding receivables & payables, interest receivable & payable, Statistics, Cash & Fund flow, Day book, List of Accounts, Reversing journals, optional vouchers, post-dated vouchers.

UNIT-IV

Create, Alter & Display Stock Groups and Stock Items, Stock item behaviour using costing and market valuation method, other behaviour like treating all sales as new manufacture, treating all purchases as consumed, treating all rejections inward as scrap, ignoring negative balances, Treating difference due to physical counting, Create, Alter & Display Stock categories, Create, Alter, Display simple & compound units of measures, Stock items using alternate units, Defining standard cost & selling price, Defining Rate of duty, Defining MRP, Create, Alter & Display Godowns, Allocation of items to the Godowns, All inventory voucher types and transactions, Inventory details in accounting vouchers, Defining re-order level, Transactions using tracking

numbers, Use of batch-wise details in voucher, Additional cost details in vouchers, Creating Bill of material, Cost estimation, Creating Price list & defining Price levels, invoice using Price list, Zero valued entries, Transactions in case of Different actual & billed quantities. Reports like Stock

summary, Inventory books like Stock item, Group summary, Stock transfers, Physical stock register, Movement analysis, Stock group & item analysis, stock category analysis, Ageing analysis, Sales order & Purchase order book, Statement of inventory related to Godowns, categories, stock query, Reorder status, Purchase & Sales order summary, Purchase & Sales bill pending, Exception reports like negative stock & ledger, overdue receivables & payables, memorandum vouchers, optional vouchers, post-dated vouchers, reversing journals.

UNIT-V

Cheque Printing, Common printing options, Different printing formats, Multi-Account printing, Dynamic- Report specific options. Creating Group Company, Use of Tally vault, Using Security control & defining different security levels, Use of Tally Audit. Back-up & Restore, Splitting company data, Export & import of Data, ODBC compliance, use of E-mail, Internet publishing, Upload, web browser & online help, Re-write data.

Referential Books:

• Implementing Tally 7.2 by Nadhani; BPB Publications, ISBN: 817656494X
• BPB Tally 7.2 by BPB Editorial Board (Hindi) BPB Publications, ISBN 81-7656-594-6

SEMESTER -III

Course Code	Course Name
0327001	Object Oriented Programming Using C++
0327002	Data Structure Using C & C++
0327003	Operating System concepts
0327004	Web Designing
0327005	Numerical Methods
0327080	Web designing, C++ & DS Lab

Course Name: Object Oriented Programming using C++

Course Code: 0327001 Internal/External Marks: 25/75 Credit: 4

UNIT-I

Introduction : Introducing Object – Oriented Approach, Relating to other paradigms {Functional, Data decomposition}.

Basic terms and ideas: Abstraction, Encapsulation, Inheritance, Polymorphism, Review of C, Difference between C and C++ - cin, cout, new, delete, operators.

UNIT-II

Classes and Objects: Encapsulation, information hiding, abstract data types, Object & classes, attributes, methods, C++ class declaration, State identity and behaviour of an object, Constructors and destructors, instantiation of objects, Default parameter value, object types, C++ garbage collection, dynamic memory allocation, Meta class / abstract classes.

UNIT-III

Inheritance and Polymorphism: Inheritance, Class hierarchy, derivation – public, private & protected, Aggregation, composition vs classification hierarchies, Polymorphism, Categorization of polymorphism techniques, Method polymorphism, Polymorphism by parameter, Operator overloading, Parametric Polymorphism

UNIT-IV

Generic function: Template function, function name overloading, overriding inheritance methods, Run time polymorphism, Multiple Inheritance.

UNIT-V

Files and Exception Handling: Streams and files, Namespaces, Exception handling, Generic Classes

Referential Books:

- R.Lafore, "Object Oriented Programming using C++", Galgotia Publications, 2004 4. D.Parasons.
- "Object Oriented Programming using C++", BPB Publication.

Course Name: Data Structure Using C & C++

Course Code: 0327002 Internal/External Marks: 25/75 Credit: 4

UNIT-I

Introduction to Data Structure and its Characteristics Array

Representation of single and multidimensional arrays; Sparse arrays – lower and upper triangular matrices and Tri diagonal matrices with Vector Representation also.

UNIT-II

Stacks and Queues : Introduction and primitive operations on stack; Stack application; Infix, postfix, prefix expressions; Evaluation of postfix expression; Conversion between prefix, infix and postfix, introduction and primitive operation on queues, D- queues and priority queues.

UNIT-III

Lists: Introduction to linked lists; Sequential and linked lists, operations such as traversal, insertion, deletion searching, Two way lists and Use of headers

UNIT-IV

Trees: Introduction and terminology; Traversal of binary trees; Recursive algorithms for tree operations such as traversal, insertion, deletion; Binary Search Tree

UNIT-V

B-Trees: Introduction, The invention of B-Tree; Statement of the problem; Indexing with binary search trees; a better approach to tree indexes; B-Trees; working up from the bottom; Example for creating a B-Tree

UNIT-VI

Sorting Techniques; Insertion sort, selection sort, merge sort, heap sort, searching Techniques: linear search, binary search and hashing

Referential Books:

- E.Horowiz and S.Sahani, " Fundamentals of Data structures", Galgotia Book source Pvt. Ltd.2003
- R.S.Salaria, " Data Structures & Algorithms" , Khanna Book Pblishing Co. (P) Ltd..,2002
- . Y.Langsam et. Al., " Data Structures using C and C++" , PHI, 1999

Course Name: Operating System Concepts

Course Code: 0327003 Internal/External Marks: 25/75 Credit: 4

UNIT-I

Introduction, What is an operating system, Simple Batch Systems, Multi-programmed Batch systems, Time- Sharing Systems, Personal – Computer Systems, Parallel systems, Distributed systems, Real- Time Systems**.**

Memory Management: Background, Logical versus physical Address space, swapping, Contiguous allocation, Paging, Segmentation

Virtual Memory: Demand Paging, Page Replacement, Page- replacement Algorithms, Performance of Demand Paging, Allocation of Frames, Thrashing, Other Considerations

UNIT-II

Processes: Process Concept, Process Scheduling, Operation on Processes

CPU Scheduling: Basic Concepts, Scheduling Criteria, Scheduling Algorithms, Multiple – Processor Scheduling.

Process Synchronization: Background, The Critical – Section Problem, Synchronization Hardware, Semaphores, Classical Problems of Synchronization

UNIT-III

Deadlocks: System Model, Deadlock Characterization, Methods for Handling Deadlocks, Deadlock prevention, Deadlock Avoidance, Deadlock Detection, Recovery from Deadlock

UNIT-IV

Device Management: Techniques for Device Management, Dedicated Devices, Shared Devices, Virtual Devices; Input or Output Devices, Storage Devices, Buffering, Secondary Storage Structure: Disk Structure, Disk Scheduling, Disk Management, Swap- Space Management, Disk Reliability

UNIT-V

Information Management: Introduction, A Simple File system, General Model of a File System, Symbolic File System, Basic File System, Access Control Verification, Logical File System, Physical File system File – System Interface; File Concept, Access Methods, Directory Structure, Protection, Consistency Semantics File – System Implementation: File – System Structure, Allocation Methods, Free- Space Management

Referential Books:

- Silbersachatz and Galvin, " Operating System Concepts", Person, 5th Ed. 2001
- Madnick E., Donovan J., " Operating Systems:,Tata McGraw Hill,2001
- Tannenbaum, "Operating Systems", PHI, 4th Edition, 2000

Course Name: Web Designing

Course Code: 0327004 Internal/External Marks: 25/75 Credit: 4

Unit- I

Introduction : Basic principles involved in developing a web site, Planning process , Domains and Hosting, Responsive Web Designing , Types of Websites (Static and Dynamic Websites), Web Standards and W3C recommendations, Introduction to HTML: What is HTML , HTML Documents, Basic structure of an HTML document , Creating an HTML document , Mark up Tags , Heading-Paragraphs , Line Breaks.

Unit- II

Elements of HTML: HTML Tags., Working with Text, Working with Lists, Tables and Frames, Working with Hyperlinks, Images and Multimedia, Working with Forms and controls

Unit- III

Concept of CSS: Creating Style Sheet, CSS Properties, CSS Styling (Background, Text Format, Controlling Fonts), Working with block elements and objects , Working with Lists and Tables , CSS Id and Class, Box Model(Introduction, Border properties, Padding Properties, Margin properties) CSS Advanced(Grouping, Dimension, Display, Positioning, Floating, Align, Pseudo class, Navigation Bar, Image Sprites, Attribute sector) , CSS Color , Creating page Layout and Site Designs.

Unit- IV

Introduction to Client Side Scripting , Introduction to Java Script , JavaScript Types , Variables in JS, Operators in JS Conditions Statements , Java Script Loops, JS Popup Boxes , JS Events , JS Arrays, Working with Arrays, JS Objects JS Functions , Using Java Script in Real time , Validation of Forms, Related Examples

Unit- V

Web Hosting: Web Hosting Basics, Types of Hosting Packages, Registering domains, Defining Name Servers, Using Control Panel, Creating Emails in Cpanel , Using FTP Client, Maintaining a Website

Concepts of SEO: Basics of SEO, Importance of SEO, On page Optimization Basics.

Referential Books:

- Steven M. Schafer, “HTML, XHTML, and CSS Bible, 5ed”, Wiley India
- Ian Pouncey, Richard York, “Beginning CSS: Cascading Style Sheets for Web Design”, Wiley India

Course Name: Numerical Methods

Course Code: 0327005 Internal/External Marks: 25/75 Credit: 4

UNIT-I

Roots of Equations: Bisections Method, False Position Method, Newton's Raphson Method, Rate of convergence of Newton's method.

UNIT-II

Interpolation and Extrapolation : Finite Differences, The operator E, Newton's Forward and Backward Differences, Newton's dividend differences formulae, Lagrange's Interpolation formula for unequal Intervals, Gauss's Interpolation formula, Starling formula, Bessel's formula, Laplace-Everett formula.

UNIT-III

Numerical Differentiation Numerical Integration : Introduction, direct methods, maxima and minima of a tabulated function, General Quadratic formula, Trapezoidal rule, Simpson's One third rule, Simpson's three- eight rule.

UNIT-IV

Solution of Linear Equation: Gauss's Elimination method and Gauss's Siedel iterative method.

UNIT-V

Solution of Differential Equations: Euler's method, Picard's method, Fourth-order Ranga – Kutta method.

Referential Books:

- Scarbourogh, "Numerical Analysis".
- Gupta & Bose S.C. "Introduction to Numerical Analysis, "Academic Press, Kolkata,
- S.S.Shashtri, " Numerical Analysis", PHI

SEMESTER -IV

Course Code	Course Name
0427001	Web Development Using PHP
0427002	Introduction to Python
0427003	Software Engineering
0427004	Introduction to DBMS
0427005	Optimization Techniques
0427080	PHP , PYTHON Prog. & DBMS Lab

Course Name: Web development using PHP.

Course Code: 0427001 Internal/External Marks: 25/75 Credit: 4

UNIT-I

Introduction to PHP, History of PHP, Versions of PHP, Features of PHP, Advantages of PHP over Other Scripting Languages, software requirements, Installation and Configuration of PHP, Installing and Configuring Apache to use PHP on Windows, Basic HTML, Embedding PHP in HTML, PHP Basic syntax, data types, comments, variables and constants, scope of variables, PHP arrays: creating array and accessing array elements, PHP String, PHP operators, precedence of operators, expressions, creating a PHP Script, running a PHP script.

UNIT-II

PHP conditional statements, switch case, PHP looping statements, while, for and do while loop, break, continue, exit, PHP functions: built-in and user defined function, declaration and calling of a function, function argument with call by value, call by reference, string manipulation, mathematical, date and time functions.

UNIT-III

Introduction to a web form, processing a web form, capturing form data, passing information between pages, PHP $_GET, PHP $_POST, with multi value fields, validating a web form, input validation, exception and error handling, introduction to cookies and session handling.

UNIT-IV

Working with database: PHP supported databases, using PHP & MySQL: Installation and configuration of MySQL on windows, checking configuration, connecting to database, selecting a database, adding table and altering table in a database, inserting, deleting and modifying data in a table, retrieving data, performing queries, processing result sets.

UNIT-V

Code re-use, require(), include(), and the include_path, PHP file permissions, working with files: opening, closing, reading, writing a file, file system functions and file input and output, working with directory: creating, deleting, changing a directory, file uploads, introduction to object oriented programming with PHP.

Referential Books:

- Steven Holzner, The Complete Reference PHP, TMH
- Steve Suehring, Tim Converse and Joyce Park, Wiley-India Pvt Ltd
- Matt Doyle, Beginning PHP, Wiley-India Pvt Ltd
- Joel Murach and Ray Harris, Murach's PHP & MySQL, SPD Pvt Ltd

Course Name: Introduction to Python

Course Code: 0427002 Internal/External Marks: 25/75 Credit: 4

UNIT-I

Planning the computer program: concept of problem solving, problem definition, program design, debugging, types of errors in programming, documentation. Techniques of problem solving: flowcharting, decision table, algorithms, structured programming concepts, programming methodologies viz. Top-down and bottom-up programming. Overview of programming: structure of a python program, elements of pythonMemory

UNIT-II

Introduction to python: python interpreter, using python as calculator, python shell, indentation. Atoms, identifiers and keywords, literals, strings, operators (arithmetic operator, relational operator, logical or Boolean operator, assignment, operator, ternary operator, bit wise operator, increment or decrement operator) Creating python programs: input and output statements, control statements(branching, looping, conditional statement, exit function, difference between break, continue and pass.), defining functions, default arguments, errors and exceptions. Iteration and recursion: conditional execution, alternative execution, nested conditionals, the return statement.

UNIT-III

Recursion, stack diagrams for recursive functions, multiple assignment, the while statement, tables, two-dimensional tables Strings and lists: string as a compound data type, length, traversal and the for loop, string slices, string comparison, a find function.

UNIT-IV

Looping and counting, list values, accessing elements, list length, list membership, lists and for loops, list operations, list deletion. Cloning lists, nested lists Object oriented programming: introduction to classes, objects and methods, standard libraries.

UNIT-V

Data structures: arrays, list, set, stacks and queues. Searching and sorting: linear and binary search, bubble, selection and insertion sorting.

Referential Books:

- T. Budd, Exploring Python, TMH, 1st Ed, 2011
- How to think like a computer scientist: learning with Python / Allen Downey, Jeffrey Elkner, Chris Meyers.

Course Name: Software Engineering

Course Code: 0427003 Internal/External Marks: 25/75 Credit: 4

UNIT-I

Software Engineering: Definition and paradigms, A generic view of software engineering.

UNIT-II

Requirements Analysis: Statement of system scope, isolation of top level processes and entitles and their allocation to physical elements, refinement and review.

Analyzing a problem, creating a software specification document, review for correctness, consistency, and completeness.

UNIT-III

Designing Software Solutions: Refining the software Specification; Application of fundamental design concept for data, architectural and procedural designs using software blue print methodology and object oriented design paradigm; Creating design document: Review of conformance to software requirements and quality.

UNIT-IV

Software Implementation: Relationship between design and implementation, Implementation issues and programming support environment, Coding the procedural design, Good coding style and review of correctness and readability.

UNIT-V

Software Maintenance: Maintenance as part of software evaluation, reasons for maintenance, types of maintenance (Perceptive, adoptive, corrective), designing for maintainability, techniques for maintenance.

UNIT-VI

Comprehensive examples using available software platforms/case tools, Configuration Management.

Referential Books:

- K.K.Aggarwal & Yogesh Singh "Software engineering", 2nd Ed., New Age International 2005.
- I.Sommerville, "Software Engineering", Addison Wesley, 2002.
- James Peter, W. Pedrycz, "Software Engineering: An Engineering Approach" John Wiley & Sons

Course Name: Introduction to DBMS

Course Code: 0427004 Internal/External Marks: 25/75 Credit: 4

UNIT-I

Introduction: Characteristics of database approach, data models, DBMS architecture and data independence.

UNIT-II

E-R Modeling: Entity types, Entity set, attribute and key, relationships, relation types, roles and structural constraints, weak entities, enhanced E-R and object modeling, Sub classes; Super classes, inheritance, specialization and generalization.

UNIT-III

File Organization: Indexed sequential access files; implementation using B & B++ trees, hashing, hashing functions, collision resolution, extendible hashing, dynamic hashing approach implementation and performance.

UNIT-IV

Relational Data Model: Relational model concepts, relational constraints, relational alzebra

SQL: SQL queries, programming using SQL.

UNIT-V

EER and ER to relational mapping: Data base design using EER to relational language.

UNIT-VI

Data Normalization: Functional Dependencies, Normal form up to 3rd normal form.

Concurrency Control: Transaction processing, locking techniques and associated, database recovery, security and authorization. Recovery Techniques, Database Security

Referential Books:

- Abraham Silberschatz, Henry Korth, S.Sudarshan,"Database Systems Concepts", 4 th Edition, McGraw Hill, 1997.
- Jim Melton, Alan Simon, "Understanding the new SQL: A complete Guide", Morgan
- A.K.Majumdar, P. Bhattacharya, "Database Management Systems", TMH, 1996.
- Bipin Desai, "An Introduction to database systems", Galgotia Publications, 1991.

Course Name: Optimization Techniques

Course Code: 0427005 Internal/External Marks: 25/75 Credit: 4

UNIT-I

Linear programming

Central Problem of linear Programming various definitions included Statements of basic theorem and also their properties, simplex methods, primal and dual simplex method, transport problem, tic-tac problem, and its solution. Assignment problem and its solution. Graphical Method Formulation, Linear Programming Problem.

UNIT-II

Queuing Theory

Characteristics of queuing system, Classification of Queuing Model Single Channel Queuing Theory, Generalization of steady state M/M/1 queuing models(Model-I, Model-II).

UNIT-III

Replacement Theory

Replacement of item that deteriorates replacement of items that fail. Group replacement and individual replacement.

UNIT-IV

Inventory Theory

Cost involved in inventory problem- single item deterministic model economics long size model without shortage and with shorter having production rate infinite and finite.

UNIT-V

Job Sequencing

Introduction, solution of sequencing problem Johnson s algorithm for n jobs through 2 machines

Referential Books:

- Gillet B.E. “Introduction to Operation Research”
- Taha,H.A. “Operation Research - an introduction”
- Kanti Swarup “Operation Research”

SEMESTER -V

Course Code	Course Name
0527001	Java Programming
0527002	Computer Network
0527003	Computer Graphics & Multimedia Application
0527004 or 0527005	**Elective -I** **(A)** IT Trends & Technologies or (B) INTRODUCTION TO STATISTICS
0527065	Minor Project
0527080	Java & Computer Graphics Lab

Course Name: Java Programming

Course Code: 0527001 Internal/External Marks: 25/75 Credit: 4

UNIT-I

JAVA DATA TYPES AND OPERATORS: Genesis of Java: Creation of Java – why java is important to internet – The java Buzz words – An overview of Java Object Oriented Programming. Data types: Simple types – Integers – Floating point types – characters – Booleans – A closer Look at Literals – Variables – Type conversion and casting – Automatic type promotion in Expressions – Strings. Arrays: One Dimensional Array – Multi Dimensional Array. Operator: Arithmetic Operators – Bitwise operators – Relational operators – Boolean Logical operators – Assignment operators – Conditional operators–Operator Precedence

UNIT-II

INTRODUCING CLASSES, METHODS AND INHERITANCE Class Fundamentals – Declaring objects – Assigning object Reference variables – Introducing Methods – Constructors – Garbage collection – Finalize () Method – Stack class. A Closer Look at Methods and classes: Overloading Methods – Using object as parameters – Argument passing – Returning objects – Recursion – Introducing Access control – understanding static – Introducing final – Nested and Inner classes – String class – Using command line arguments. Inheritance Basics – Using super – creating Multilevel Hierarchy – Method overriding – Dynamic Method Dispatch – Using Abstract class – Using final with inheritance – The object class.

UNIT-III

PACKAGES, INTERFACES, EXCEPTION HANDLING AND MULTITHREADING:

Packages – Access Protection – Importing packages – Interfaces. Exception Handling Introduction – Exception Types – Uncaught Exceptions – Using try and catch – Multiple catch clauses – Nested try statements – throw- throws- finally – Java's Built – in Exception – creating your own Exception subclasses. Multithreaded Programming: Java Thread Model – Main Thread – Creating a Thread - Creating Multiple Threads–Using is Alive () and join () – Thread priorities – Synchronization – Inter thread Communication – Suspending Resuming: and stopping Threads – Using Multithreading

UNIT-IV

APPLETS AND EVENT HANDLING:

I/O, Applets and other topics: I/O Basics Reading console Input – writing console output – The Print Writer class – Reading and Writing Files. The Applet class: Applet Basics – Applet Architecture – Applet Skeleton – Applet Display method – Requesting Repainting – HTML APPLET tag- Passing Parameters to Applet – Audio Clip Interface. Event Handling Mechanisms – Delegation Event Model – Event classes (The Action Event Item Event, Key Event, Mouse Event) – Sources of Events – Event Listener Interfaces (Action Listener, Item Listener, Key Listener, Mouse Listener) – Adapter Classes.

UNIT-V

INTRODUCING AWT AND AWT CONTROLS:

AWT Classes – Window fundamentals – working with Frame Windows - working with Graphic

Using AWT controls: Controls fundamentals – Labels – using Buttons – Applying check Boxes – Check Box group – Choice controls – Using a Text field – Using a Text Area – Understanding Layout Managers (Flow Layout only) – Menu Bars and Menus.

Referential Books:

- Introduction to OOP through Java – ISRD Group Tata McGraw hill.
- Programming with Java - a primer 3/E E. BALAGURUSWAMY.
- Patrick Naughton and Herbertz Schildt, "Java-2 The Complete Reference" 199, TMH.

Course Name: Computer Network

Course Code: 0527002 Internal/External Marks: 25/75 Credit: 4

UNIT-I

Basic Concepts: Components of data communication, distributed processing, standards and organizations. Line configuration, topology, Transmission mode, and categories of networks.

OSI and TCP/IP Models: Layers and their functions, comparison of models.

Digital Transmission: Interfaces and Modems**:** DTE-DCE Interface, Modems, Cable modems.

UNIT-II

Transmission Media: Guided and unguided, Attenuation, distortion, noise, throughput, propagation speed and time, wavelength, Shannon capacity, comparison of media

UNIT-III

Telephony: Multiplexing, error detection and correction: Many to one, One to many, WDM, TDM, FDM, Circuit switching, packet switching and message switching.

Data link control protocols: Line discipline, flow control, error control, synchronous and asynchronous protocols, character and bit oriented protocols, Link access procedures.

Point to point controls: Transmission states, PPP layers, LCP, Authentication, NCP.

ISDN: Services, Historical outline, subscriber's access, ISDN Layers and broadcast ISDN.

UNIT-IV

Devices: Repeaters, bridges, gateways, routers, The Network Layer; Design issues, Routing algorithms, Congestion control Algorithms, Quality of service, Internet working, Network-Layer in the internet.

UNIT-V

Transport and upper layers in OSI Model: Transport layer functions, connection management, functions of session layers, presentation layer and application layer.

Referential Books:

- A.S.Tanenbaum, "Computer Networks"; Pearson Education Asia, 4th Ed. 2003.
- Behrouz A.Forouzan, "Data Communication and Networking", 3rd Ed. Tata MCGraw Hill, 2004.
- William stallings, "Data and computer communications", Pearson education Asia, 7 th Ed., 2002.

Course Name: Computer Graphics & Multimedia Application

Course Code: 0527003 Internal/External Marks: 25/75 Credit: 4

UNIT-I

Introduction: The Advantages of Interactive Graphics, Representative Uses of Computer Graphics, Classification of Application Development of Hardware and software for computer Graphics, Conceptual Framework for Interactive Graphics, Overview, Scan: Converting Lines, Scan Converting Circles, Scan Converting Ellipses.

UNIT-II

Hardcopy Technologies, Display Technologies, Raster-Scan Display System, Video

Controller, Random-Scan Display processor, Input Devices for Operator Interaction, Image Scanners, Working exposure on graphics tools like Dream Weaver, 3D Effects etc,

Clipping

Southland- Cohen Algorithm, Cyrus-Beck Algorithm, Midpoint Subdivision Algorithm

UNIT-III

Geometrical Transformation

2D Transformation, Homogeneous Coordinates and Matrix Representation of 2D Transformations, composition of 2D Transformations, the Window-to-Viewport Transformations, Introduction to 3D Transformations Matrix.

UNIT-IV

Representing Curves & Surfaces

Polygon meshes parametric, Cubic Curves, Quadric Surface;

Solid Modeling

Representing Solids, Regularized Boolean Set Operation primitive Instancing Sweep Representations, Boundary Representations, Spatial Partitioning Representations, Constructive Solid Geometry Comparison of Representations.

UNIT-V

Introductory Concepts: Multimedia Definition, CD-ROM and the multimedia highway, Computer Animation (Design, types of animation, using different functions) UNIT-VI, Uses of Multimedia, Introduction to making multimedia – The stage of Project, hardware & software requirements to make good multimedia skills and Training opportunities in Multimedia Motivation for Multimedia usage

Referential Books:

- Foley, Van Dam, Feiner, Hughes, Computer Graphics Principles& practice,2000.
- D.J. Gibbs & D.C. Tsichritzs: Multimedia programming Object Environment & Frame woork , 2000.
- Ralf Skinmeiz and Klana Naharstedt, Multimedia: computing, Communication and Applications, pearson, 2001.
- D.Haran & Baker. Computer Graphics Prentice Hall of India,1986

Elective I-(A)

Course Name: IT Trends & Technologies

Course Code: 0527004 Internal/External Marks: 25/75 Credit: 4

UNIT-I

E-governance, E-democracy, Government efforts to encourage citizen participation, PPP model, E-governance websites & services, MP ONLINE services, UIDI & Aadhar, E governance mobile apps like UMANG, Digital Locker, Digital Library.

Introduction to cyber crime, types of attacks like spyware, malware, spam mail, logic bombs, denial of service, types of cyber crime like email fraud, phishing, spoofing, hacking, identity theft.

UNIT-II

E-Commerce-introductions, concepts, Advantages and Disadvantages, technology in E-Commerce, Benefits and impact of e-commerce

Electronic Payment Systems: Introduction, Types of Electronic Payment Systems, RTGS, IMPS, NEFI', Payment gateway, debit& credit card, internet banking, mobile wallet, UPI, BHIM, PAYTM app, online shopping, online marketing

UNIT-III

Introduction to wireless communication, Blue tooth, WiFi, WiMax, LiFi, Mobile technology, 2G,3G, 4G, SG services, IMEi, SIM, IPTelephony, Soft phone, Voice mail, Ad-hoc & sensor networks, GIS, ISP, Mobile Computing, Cellular System Cell, Mobile Switching office, Hands off, Base Station.

UNIT-IV

Artificial Intelligence and Expert system - Concepts of AI & Expert Systems, Merits and Demerits of Expert system, Application of Expert system and Al.

Cloud computing- Introduction, types, application, services, Google play store, Apple store,

IOT- Introduction, Application & use , Big data- Introduction, Application & use.

UNIT-V

Introduction to MIS, System Development Life Cycle, Various phases of system development, Considerations for system planning, Initial Investigation, Determining Users Requirements and Analysis, Fact Finding Process and Techniques, Data Analysis, data Dictionary, decision table, decision tree & form design process.

Referential Books:

- Fundamentals Of InformationTechnology Publications. Alex Leon &Mleon, Vikas Publications.
- E-Commerce An Indian Perspective (Second Edition) By Pt Joseph, S.J. Prentice-Hall Of India.
- System Analysis & Design by V K Jam,DreamtechPress.
- Information Technology & Computer Applictions by V K .Kapoor, Sultan Chand &Sons, New Delhi.

Elective I-(B)

Course Name: INTRODUCTION TO STATISTICS

Course Code: 0527005 Internal/External Marks: 25/75 Credit: 4

UNIT-I

COMBINATORICS: Permutation and Combination, Repetition and Constrained Repetition, Binomial Coefficients, Binomial Theorem**.**

UNIT-II

Frequency distributions, Histograms and frequency polygons, Measures of central tendency: Mean, Mode, Median, Dispersion, Mean deviation and standard deviation. Moments, Skewness, kurtosis,

UNIT-III

Elementary probability theory: Definition, conditional probability, Probability distribution, mathematical expectation.

Theoretical distribution: Binomial , poisson and Normal distribution, Relation between the binomial, poisoned Normal distribution.

UNIT-IV

Correlation and Regression: Linear Correlation, Measure of Correlation, Least Square Regression lines.

Curve fitting: Method of least square, least square line, least squares Parabola. chi-square test: definition of chi-square; signification test: contingency test, coefficient of contingency

UNIT-V

Basic of sampling theory: Sample mean and variance, students t-test, test of Hypotheses and significance, degree of freedom, Z-test, small and large sampling, Introduction to Monte Carlo method.

Referential Books:

- Advanced Engineering Mathematics: H.K. Dass; S. Chand & Co., 9 Revised Edition, 2001.
- Discrete Mathematics: S.K. Sarkar; S. Chand & Co., 2000.
- Numerical Analysis: S.S. Sastry; Prentice Hall of India, 1998.
- Mathematical Statistics: J.N. Kapoor and H.C. Saxena.
- Mathematical Statistics: M. Ray and H. Sharma

SEMESTER -VI

Course Code	Course Name
0627001	Computer Network Security
0627002	Information System Analysis Design & Implementation
0627003	E-Commerce
0627004 **or** **0627005**	**Elective -II** (A)Cloud Computing Or (B)Data Ware Housing & Data Mining
0627065	Major Project

Course Name: Computer Network Security

Course Code: 0627001 Internal/External Marks: 25/75 Credit: 4

UNIT-I

Introduction: Attack, Services and Mechanism, Model for Internetwork Security.

Cryptography: Notion of Plain Text, Encryption, Key, Cipher Text, Decryption and cryptanalysis; Public Key Encryption, digital Signatures and Authentication.

UNIT-II

Network Security:

Authentication Application: Kerveros, X.509, Directory Authentication Service, Pretty Good Privacy, S/Mime.

UNIT-III

IP security Architecture: Overview, Authentication header, Encapsulating Security Pay Load combining Security Associations, Key Management.

UNIT-IV

Web Security: Requirement, Secure Socket Layer, Transport Layer Security, and Secure Electronic Transactions.

UNIT-V

Network Management Security: Overview of SNMP Architecutre-SMMPVI1 Communication Facility, SNMPV3.

UNIT-VI

System Security: Intruders, Viruses and Relate Threats, Firewall Design Principles. Comprehensive examples using available software platforms/case tools, Configuration Management.

Referential Books:

- W. Stallings, Networks Security Essentials: Application & Standards, Pearson Education, 2000.
- W.Stallings, Cryptography and Network Security, Principles and Practice, Pearson Education, 2000.

Course Name: Information System Analysis Design and Implementation

Course Code: 0627002 Internal/External Marks: 25/75 Credit: 4

UNIT-I

Overview of System Analysis and Design: Systems Development Life Cycle; concept and Models: requirements determination, logical design, physical design, test planning, implementation, planning and performance evaluation, communication, interviewing, presentation skills; group dynamics; risk and feasibility analysis; group based approaches, JAD, structures walkthroughs, and design and code reviews; prototyping; database design software quality metrics; application categories software package evaluation and acquisition.

UNIT-II

Information Requirement Analysis: Process modeling with physical logical data flow diagrams, data modeling with logical entity relationship diagrams.

UNIT-III

Developing a Proposal: Feasibility study and cost estimation.

System Design: Design of input and control, design of output and control, file design/database design, process, user interface design, prototyping; software constructors; documentation.

UNIT-IV

Application Development Methodologies and CASE tools: Information engineering structured system analysis and design, and object oriented methodologies for application development data modeling, process modeling, user interface design, and prototyping, use of computer aided software engineering (CASE) tools in the analysis design and implementation of information systems.

UNIT-V

Design and Implementation on OO Platform: Object oriented analysis and design through object modeling technique, object modeling, dynamic modeling and functional object oriented design and object oriented programming systems for implementation, object oriented data bases.

UNIT-VI

Managerial issues in Software Projects: Introduction to software markets; planning of software projects, size and cost estimates; project scheduling; measurement of software quality and productivity, ISO and capability maturity models for organizational growth.

Referential Books:

- I.T.Haryszkiewycz, Introduction of System Analysis and Design, Pearson Education, (PHI) 1998.
- V.Rajaraman, Analysis and Design of Information System, Pearson Education, 1991.

Course Name: E-Commerce

Course Code: 0627003 Internal/External Marks: 25/75 Credit: 4

UNIT-I

Introduction to E-Commerce: The Scope of Electronic Commerce, Definition of Electronic Commerce, Electronic E-commerce and the Trade Cycle, Electronic Markets, Electronic Data Interchange, Internet Commerce, E-Commerce in Perspective.

Business Strategy in an Electronic Age: Supply Chains, Porter's Value Chain Model, Inter Organizational Value Chains, Competitive Strategy, Porter's Model, First Mover Advantage Sustainable Competitive Advantage, Competitive Advantage using E -Commerce, Business Strategy, Introduction to Business Strategy, Strategic Implications of IT, Technology, Business Environment, Business Capability, Exiting Business Strategy, Strategy Formulation & Implementation Planning, E-Commerce Implementation, E-Commerce Evaluation.

UNIT-II

Business-to-Business Electronic Commerce: Characteristics of B2B EC, Models of B2B Ec, Procurement Management Using the Buyer's Internal Marketplace, Just in Time Delivery, Other B2B Models, Auctions and Services from Traditional to Internet Based EDI, Intergration with

Back-end Information System, The Role of Software Agents for B2B EC, Electronic marketing in B2B, Solutions of B2B EC, Managerial Issues, Electronic Data Interchange (EDI), EDI: The Nuts and Bolts, EDI & Business.

UNIT-III

Internet and Extranet : Automotive Network Exchange, The Largest Extranet, Architecture of the Internet, Intranet and Extranet, Intranet software, Applications of Intranets, Intranet Application Case Studies, Considerations in Intranet Deployment, The Extranets, The structures of Extranets, Extranet products & services, Applications of Extranets, Business Models of Extranet Applications, Managerial Issues.

Electronic Payment Systems : Is SET a failure, Electronic Payments & Protocols, Security Schemes in Electronic payment systems, Electronic Credit card system on the Internet, Electronic Fund transfer and Debit cards on the Internet, Stored – value Cards and E- Cash, Electronic Check Systems, Prospect of Electronic Payment Systems, Managerial Issues.

UNIT-IV

Public Policy: From Legal Issues to Privacy : EC- Related Legal Incidents, Legal Incidents, Ethical & Other Public Policy Issues, Protecting Privacy, Protecting Intellectual Property, Free speech, Internet Indecency & Censorship, Taxation & Encryption Policies, Other Legal Issues: Contracts, Gambling & More, Consumer & Seller Protection In EC.

UNIT-V

Infrastructure For EC : It takes more than Technology, A Network Of Networks, Internet Protocols, Web- Based client/ Server, Internet Security, selling on the web, Chatting on the Web, Multimedia delivery, Analyzing Web Visits, Managerial Issues.

Referential Books:

- David Whiteley, " E-Commerce", Tata McGraw Hill, 2000.
- Eframi Turban, Jae Lee, David King, K. Michale Chung, "Electronic Commerce", Pearson Education, 2000

Elective II-(A)

Course Name: Cloud Computing.

Course Code: 0627004 Internal/External Marks: 25/75 Credit: 4

UNIT-I

Introduction to Computing Paradigms: High-Performance Computing, Parallel Computing, Distributed Computing, Cluster Computing, Grid Computing, Cloud Computing, Bio computing, Mobile Computing, Quantum Computing, Optical Computing, Nano-computing, Network Computing. Cloud Computing Fundamentals: Motivation, Need, Definition of Cloud Computing. Principles of Cloud computing: Five Essential Characteristics, Four Cloud Deployment Models, Three Service Offering Models, Cloud Ecosystem, Requirements for Cloud Services. Cloud Computing Architecture: cloud Architecture, User/Client Layer, Network Layer, Cloud Management Layer, Hardware Resource Layer, , Network Connectivity in Cloud Computing, Public Cloud Access Networking, Private Cloud Access Networking.

UNIT-II

Cloud Computing Management: Cloud Application, Benefits and Drawbacks Applications on the Cloud, Managing the Cloud, Managing the Cloud Infrastructure, Managing the Cloud Application, Migrating Application to Cloud, Cloud Deployment Models: Private Cloud, Outsourced Private Cloud, Community Cloud, On-Premise Community Cloud, Hybrid Cloud. Cloud Service Models: Infrastructure as a Service, : Platform as a Service, Software as a Service, Introduction to Open Source Tools for IaaS, Paas & SaaS : Apache..

UNIT-III

Technological Drivers for Cloud Computing: SOA and Cloud, SOA and SOC, Benefits of SOA, Multi-core Technology: Multi-core Processors and VM Scalability, Memory and Storage Technologies, Cloud Storage Requirements, Networking Technologies, Web 2.0 : Characteristics, Difference from Web 1.0, Applications, Social Media, Marketing, Education. Web 3.0: Components , Semantic Web, Web Services, Characteristics, Convergence of Cloud and Web 4.0, Connecting Information: Facebook. Agile Software Models: Agile SDLC for Cloud Computing, Features of Cloud SDLC, Agile Software Development Process, Advantages of Agile. Cloud Application Development Platforms: Windows Azure, Google App Engine, Forcecom. IBM Cloud Computing API .

UNIT-IV

Virtualization : Full Virtualization, Para virtualization, Hardware-Assisted Virtualization, Hypervisor, OS Virtualization, Server Virtualization, Memory Virtualization, Storage Virtualization, Network Virtualization, Application Virtualization, Processor Virtualization, Memory Virtualization, Storage Virtualization, Network Virtualization, Data Virtualization, Application Virtualization, Hypervisors, Types of Hypervisors, Security Issues and Recommendations, From Virtualization to Cloud Computing VMware. Microsoft Hyper-V.

UNIT-V

Cloud Service Providers ; EMC, EMC IT, Captiva Cloud Toolkit, Google, Cloud Platform, Cloud Storage, Google Cloud Connect, Google Cloud Print, Google App Engine, Amazon Web Services, Amazon Elastic Compute Cloud, Amazon Simple Storage Service, Amazon Simple Queue Service, Microsoft Azure, Microsoft Assessment and Planning Toolkit, SharePoint, IBM Smart Cloud. Security in Cloud Computing, Cloud General Challenges,

Referential Books:

- Essentials of Cloud Computing, K Chandrasekaran, CRC Press [ISBN: 3: 978--4822-0544- 2]
- Raj Kumar Buyya, James Broberg and rezeiM.Goscinski, -Cloud Computing: Principles and Paradigms,-Wiley 2011.

Elective II-(B)

Course Name: DATA WAREHOUSING & DATA MINING

Course Code: 0627005 Internal/External Marks: 25/75 Credit: 4

UNIT-I

Data Warehousing:- Introduction to Data Warehouse, its competitive advantage, Data warehouse Vs Operational Data, Things to consider while building Data Warehouse

UNIT-II

Implementation:- Building Data warehousing team, Defining data warehousing project, data warehousing project management, Project estimation for data warehousing, Data warehousing project implementation

UNIT-III

Techniques:- Bitmapped indexes, Star queries, Read only table spaces, Parallel Processing, Partition views, Optimizing extraction process

UNIT-IV

Data Mining:- Introduction to Data Mining, benefits of Data Mining, How it helps in decision making, Data mining techniques, Introduction to Data Mart, Data Mart Tools, Data warehouse vs Data Mart, OLAP and its need, MOLAP and ROLAP

Referential Books:

- Data Warehousing in the real world, Sam Anchory and Dennis Murray.
- Data Mining, Pieter Adrians and Doif Zantinge.

Course Name: Major Project

Course Code: 0627065 External Evaluation Marks: 100 Credit: 8

GUIDELINES FOR PROJECT WORK

COURSE OBJECTIVES:

* The aim of the Project work is to acquire practical knowledge on the implementation of the programming concepts studied.

* Each student should carry out group Project Work and it may be a work using the software packages that they have learned or the implementation of concepts from the papers studied or implementation of any innovative idea.

* The Project work should be compulsorily done in the college only under the supervision of the Department staff concerned (Internal assessment 100 marks. Done by college committee)

- Viva-voce will be conducted at the end of VI semester for 100 marks.