SYLLABUS

Bachelor of Computer Application (BCA)

A THREE-YEAR DEGREE COURSE

Of

University of Science and Technology, Meghalaya

Proposed to be Effective from the

Academic Session JULY-2017

Bachelor of Computer Application (BCA)

Paper Code	SUBJECT NAME	Credit	Theory/ Practical Marks	Sessional Marks	Total Marks	Course Type
1st Semester						
BCA101	Communicative English	4	70	30	100	CC
BCA102	Fundamentals of computer and Information Technology & PC Packages	4	70	30	100	FC
BCA103	Programming Methodology and C Programming	4	70	30	100	CC
BCA104	Digital Logic & Design	4	70	30	100	CC
BCA105	Practical – I (PMCP & PC Packages)	4	70	30	100	CC
Total		20			500	CC
2nd Semester						
BCA201	Data Structure through C	4	70	30	100	CC
BCA202	Relational Database Management System	4	70	30	100	CC
BCA203	Discrete Mathematics	4	70	30	100	FC
BCA204	Environmental Studies	4	70	30	100	CC
BCA205	Practical – II (Data Structure & RDBMS Using Oracle)	4	70	30	100	CC
Total		20			500	
3rd Semester						
BCA301	Object Oriented Programming with C++	4	70	30	100	CC
BCA302	Software Engineering	4	70	30	100	FC
BCA303	Computer Networks	4	70	30	100	CC
BCA304	Computer Organization & Architecture	4	70	30	100	CC
BCA305	Practical III (C++)	4	70	30	100	CC
Total		20			500	
4th Semester						
BCA401	Programming with Java	4	70	30	100	CC
BCA402	Operating System	4	70	30	100	FC
BCA403	Programming with VB.Net	4	70	30	100	CC
BCA404	Minor Project Work (Database Project)	4	70	30	100	CC
BCA405	Practical IV (Java & VB.Net)	4	70	30	100	CC
Total		20			500	
5th Semester						

BCA501	**Linux & Shell Programming**	**4**	**70**	**30**	**100**	**CC**
BCA502	**PHP Programming**	**4**	**70**	**30**	**100**	**CC**
BCA503(A)	**Internet & E-commerce**	**4**	**70**	**30**	**100**	**EC**
BCA503(B)	**Artificial Intelligence**	**4**	**70**	**30**	**100**	**EC**
BCA504	**Financial Accounting**	**4**	**70**	**30**	**100**	**CC**
BCA505	**Practical V (Linux & PHP)**	**4**	**70**	**30**	**100**	**CC**
Total		**24**			**500**	
6th Semester						
BCA601	**Major Project**	**20**			**500**	
Total		**20**			**500**	

1st Semester

Subject Name: General English

Paper Code: BEN711

Credit: 04
Marks: 70+30

OBJECTIVES

This paper has been divided into four units. The aim of the syllabus is to make students adept in official correspondence, communication skills, grammar and writing skills. The syllabus also gives scope to the students to enjoy, understand and interpret literary texts.

Unit 1: Literary Texts (Poetry) (20 hours)

This particular unit will help the students to enjoy, understand and interpret poems and develop a taste for fine poetry. The texts that have been chosen to be included are as follows:

- "The Poison Tree" by William Blake
- "The Daffodils" by William Wordsworth
- "If" by Rudyard Kipling.

Unit 2: Literary Texts (Prose) (25 hours)

This particular unit will help the students to foster a taste for literary prose pieces. The texts that have been chosen to be included are as follows:

- "The Stolen Bacillus" by H.G. Wells.
- "The Verger" by Somerset Maugham.
- "Shooting an Elephant" by George Orwell.

Unit 3: Grammar and Usage: (20 hours)

- Determiners, Tenses, Voice, Direct and Indirect Speech, Punctuation, Word Formation, Antonyms and Synonyms, Homophones, One word substitution.
- Idioms and Phrases

Unit 4: Writing Skills: (25 hours)

This part would include areas like official correspondence, Letter (Formal and Informal), Circular, Notice, Writing Cvs/ Resume, Essay writing, e-mail writing, Blog writing, Story Writing, Paragraph writing.

The second section of this part will include **Comprehension** and **Precis Writing** that will enable the students to understand a particular passage and then express their opinions in their own language. This will enhance the student's reading and writing abilities.

 # Suggested Readings:

- Nilanjana Gupta, *Communicate With Confidence,* Anthem Press.
- V. Shyamala, *Effective English Communication for You,* Emerald Publisher.
- Krishnamohan and Meera Bannerji, *Developing Communication Skills.*
- R.K. Madhukar, *Business Communication,* Vikash Publishing house Pvt. Ltd.
- Shalin Sharma, *Concepts of Professional Communication,* Acme Learning
- Daniel Jones, *English Phonetics.*
- R.K. Bansal and Harrison, *Spoken English for India,* Sec. Ed. Madras Orient Longman.
- Donald Treadwell and Jill B. Treadwell, *Public Relations Writing,* Sec. Ed. Sage Publications, Inc.
- P.D. Chaturvedi and Mukesh Chaturvedi, *Business Communication Concepts, Cases and Applications,* Sec. Ed. Manipal Press Limited.
- Sarah Trenholm and Arthur Jensen, *Interpersonal Communication,* Sixth Ed. Oxford University Press.
- Pulak Bhattacharyya (ed), *Musings- II: A Collection of English Prose*, Book Land Publishers.
- David V. Erdman(ed), *The Complete Poetry and Prose of William Blake*, Anchor Publishers.
- Maugham,Somerset, 65 Short Stories,Heinemann: London,1988[rpt]
- *Henry Reed(ed), The Complete Poetical Works of William Wordsworth, Troutman and Hayes Publishers.*

Subject Name: Fundamentals of Computer and Information Technology & PC packages

Paper Code: BCA102

UNIT- I

Brief History of Development of Computers, Computer System Concepts, Computer System Characteristics, Capabilities and Limitations, Types of Computers, Basic Components of a Computer System - Control Unit, ALU, Input/output Functions and Characteristics, Memory RAM, ROM, EPROM, PROM and other types of Memory. Input/ Output & Storage Units - Keyboard, Mouse, Trackball, Joystick, Digitizing tablet, Scanners, Digital Camera, MICR, OCR, OMR, Barcode Reader, Voice Recognition, Light pen, Touch Screen, Monitors - Characteristics and types of monitor , Size, Resolution, Refresh, Dot Pitch, Video Standard - VGA, SVGA, XGA Printers and its Types - Dot Matrix, Inkjet, Laser, Plotter, Sound Card and Speakers, Storage Fundamentals - Primary Vs Secondary data Storage, Various Storage Devices - Hard Disk Drives, Floppy Disks ,Optical Disks, Flash Drives.

UNIT- II

Use of Communication and IT, Communication Process, Communication Types- Simplex, Half Duplex, Full Duplex, Serial and Parallel Communication, Types of Network - LAN, WAN, MAN , Internet, Topologies of LAN - Ring, Bus, Star, Mesh and Tree Topologies, World Wide Web and its Applications and Internet Services.
Software and its Need, Types of Software - System Software, Application Software, System Software - Operating System, Utility Program, Programming Languages, Assemblers, Compilers and Interpreter, Programming Languages- Machine, Assembly, High Level, 4GL.

UNIT - III

Working with MS Word, Menus & Commands, Toolbars & Buttons, Shortcut Menus, Wizards & Templates, Creating a New Document, Different Page Views and layouts, Applying various Text Enhancements, Working with Styles, Text Attributes, Paragraph and Page Formatting, Text Editing using various features , Bullets, Numbering, Auto formatting, Printing & various print options, Advanced Features of MS Word, Spell Check, Thesaurus, Find & Replace; Headers & Footers, Inserting Page Numbers, Pictures, Files, Auto texts, Symbols, Working with Columns, Tabs & Indents, Creation & Working with Tables including conversion to and from text, Margins & Space management in Document, Adding References and Graphics, Mail Merge, Envelops & Mailing Labels. Importing and exporting to and from various formats.

UNIT- IV

MS Excel - Introduction and area of use, Working with MS Excel, concepts of Workbook & Worksheets, Using Wizards, Various Data Types, Using different features with Data, Cell and Texts, Inserting, Removing & Resizing of Columns & Rows, Working with Data & Ranges, Different Views of Worksheets, Column Freezing, Labels, Hiding, Splitting etc., Using different features with Data and Text; Use of Formulas, Calculations & Functions, Cell Formatting including Borders & Shading, Working with Different Chart Types; Printing of Workbook & Worksheets with various options.

UNIT - V

MS PowerPoint - Introduction & area of use, Working with MS PowerPoint, Creating a New Presentation, Working with Presentation, Using Wizards, Slides & it's different views, Inserting, Deleting and Copying of Slides, Working with Notes, Handouts, Columns & Lists, Adding Graphics, Sounds and Movies to a Slide, Working with PowerPoint Objects, Designing & Presentation of a Slide Show, Printing Presentations, Notes,

Handouts with print options. Outlook Express, Features and uses, Configuration and using Outlook Express for accessing e-mails in office.

TEXT & REFERENCE BOOKS:

• *COMPUTERS TODAY, BY S.K BASANDRA, GALGOTIA PUBLICATIONS.*
• *FUNDAMENTALS OF INFORMATION TECHNOLOGY ALEXIS LEON & MATHEWS LEON, , VIKAS PUBLISHING*
• *WINDOWS XP COMPLETE REFERENCE, BPB PUBLICATIONS*
MS OFFICE XP COMPLETE, BPB PUBLICATION

Subject Name: Programming Methodology and C Programming

Paper Code: BCA103

UNIT - I
Program Concept, Characteristics of Programming, Various Stages in Program Development, Algorithms, Flow Charts, Programming Techniques – Top Down, Bottom Up, Modular, Structured, Features, Merits, Demerits and Their Comparative Study. Programming Logic - Simple, Branching, Looping, Recursion, Programming Testing & Debugging.

UNIT- II
Introduction to C Language, C Language Standards, Features of C, Structure of C Program, Introduction to C Compilers, Creating and Compiling C Programs, IDE, Features of Turbo C Compiler. Keywords, Identifiers, Variables, Constants, Scope and Life of Variables, Local and Global Variable, Data Types, Expressions. Operators - Arithmetic, Logical, Relational, Conditional and Bit Wise Operators, Precedence and Associativity of Operators, Type Conversion. Basic Input/Output Library Functions ,Character Input/Output getch(), getchar(). getche(), putchar(). Formatted Input/Output - printf() and scanf(), Mathematical & Character Functions.

UNIT- III
Declaration Statement, Conditional Statement - if Statement, if else Statement, Nesting of if... .else Statement, else if Ladder, The ?: Operator, switch Statement. Iteration Statements - for Loop, while Loop, do-while Loop. Jump Statements: break, continue, goto, exit(). Arrays - Concept of Single and Multi Dimensional Arrays Strings : Declaration, Initialization, Functions

UNIT – IV
The Need of C Functions, User Defined and Library Function, Prototype of Functions, Prototype of main() Function, Calling of Functions, Function Arguments, Argument Passing: Call By Value and Call By Reference, Return Values. Nesting of Function, Recursion, Array as Function Argument, Command Line Arguments, Storage Class Specifier - Auto, Extern, Static, Register.

UNIT - V

Defining Structure, Declaration of Structure Variable, Type def, Accessing Structure Members, Nested Structures, Array of Structure, Structure Assignment, Structure as Function Argument, Function that Return Structure, Union.

TEXT & REFERENCE BOOKS:

• *BALAGURUSWAMY, "PROGRAMMINGIN C ", TMH PUBLICATIONS*
• *GOTTFRIED SCHAUMS OUTLINE SERIES, "PROGRAMMING WITH C ", TMH PUBLICATIONS*
• *MAHAPATRA, " THINKING IN C ", (PHI)PUBLICATIONS*
• *ANURAG SEETHA, "INTRODUCTION TO COMPUTERS AND INFORMATION TECHNOLOGY", RAIN PRASAD & SONS, BHOPAL*
• *S.K. BASANDRA, "COMPUTERS TODAY", GALGOTIA PUBLICATIONS.*
• *PETER JULIFF "PROGRAM DESIGN" PHI PUBLICATIONS*

Subject Name: Digital Logic & Design

Paper Code: BCA104

UNIT-I
Data representation Data Types and Number Systems, Binary Number System, Octal & Hexa-Decimal Number System, Fixed Point Representation, 1's & 2's Complement, Binary, Arithmetic Operation on Binary Numbers, Overflow & Underflow, Floating Point Representation, Codes, ASCII, EBCDIC Codes, Gray Code, Excess-3 & BCD, Error Detection & Correcting Codes Binary Storage and Registers.

UNIT-II
Boolean algebra and digital logic circuits -Logic Gates, AND, OR, NOT,, NOR, NAND & XOR Gates and their Truth Tables, Boolean Algebra, Basic Definition and Properties, Basic Boolean Law's, Demorgan's Theorem, Minimization Techniques, K Map – Two, Three and More Variables maps, Sum of Product & Product of Sums, Don't care conditions.

UNIT-III
Combination Circuits - Half adder & Full adder, Full Subtractor, Full Subtractor and decimal adder, Code Conversion, Multilevel NAND and NOR Circuits, Decimal adder, decoders, Multiplexers and Demultiplexers.

UNIT-IV
Sequential logic- Flip-Flops - RS, D, JK & T Flip-Flop, Triggering in flip flops, Analysis of Clocked Sequential Circuits, State Reduction and Assignment, flip flop excitation tables, Design procedure and design of counters. Design with equations.

UNIT-V
Registers, Counters and the memory unit, Shift registers, Ripple counters and Synchronous counters, Inter-register Transfer, Arithmetic Logic and Shift Micro Operation, Conditional Control Statement, Instruction Codes, Processor organization, design of a simple computer.

TEXT & REFERENCE BOOKS:

- *DIGITAL LOGIC AND COMPUTER DESIGN BY MORRIS MANO*
- *COMPUTER SYSTEM ARCHITECTURE BY MORRIS MANO*

2nd Semester

Subject Name: Data Structure through C

Paper Code: BCA201

UNIT – I

The Concept of Data Structure, Abstract Data Type, Concept of List & Array, Introduction to Stack, Stack as an Abstract Data Type, Primitive Operation on Stack, Stack's Application - Infix, Postfix, Prefix and Recursion. Introduction to Queues, Primitive Operations on Queues, Queue as an Abstract Data type, Circular Queue, Dequeue, Priority Queue, Applications of Queue.

UNIT – II

Linked List - Introduction to Linked List, Memory Representation of Linked List, Operations on Linked List, Linked List Representation of Stack and Queue, Header Nodes. Types of Linked List - Doubly Linked List, Circular Linked List, Application of Linked List.

UNIT –III

Trees - Basic Terminology of Trees, Binary Trees, Tree Representations as Array & Linked List. Binary Tree Representation. Traversal of Binary Trees - Inorder, Preorder & Postorder, Application of Binary Tree, Threaded Binary tree, Height Balanced tree, B-tree.

UNIT-IV

Analysis of Algorithm, Complexity with Big'O' Notation. Searching – Sequential Search, Binary Search and their Comparison. Sorting - External & Internal Sorting, Insertion Sort, Selection Sort, Quick Sort, Bubble Sort, Heap Sort, Comparison of Sorting Methods.

UNIT-V

Graphs - Introduction to Graphs, Basic Terminology, Directed, Undirected & Weighted graph, Representation of Graphs, Graph Traversals - Depth First & Breadth First Search. Spanning Trees, Minimum Spanning Tree, Applications of Graphs : Shortest Path Problem using Dijkstra Method.

TEXT & REFERENCE BOOKS:

- *FUNDAMENTALS OF DATA STRUCTURE, BY S. SAWHNEV & E. HOROWITZ*
- *DATA STRUCTURE: BY T REMBLEY & SORRENSON*
- *DATA STRUCTURE: BY LIPSCHUISTS (SCHAUM 'S OUTLINE SERIES MCGRAW HILL PUBLICATION)*
- *FUNDAMENTALS OF COMPUTER ALGORITHM: BY ELLIS HOROWITZ AND SARTAJ SAWHNEY*

Subject Name: Relational Database Management System

Paper Code: BCA 202

UNIT- I
Introduction To Database Systems Purpose of Database System, View Of Data, Characteristics of Database Approach, Architecture for a Database System, Advantages and Disadvantages Of DBMS, Database Users and Administrator, Database Design and ER Model , Data Model Classification.

UNIT-II
Structure of Relational Database, Database Schema, Key, Relational Operations Formal Relational Query Languages.

UNIT-III
Features of Good Database Design, Universal Relation, Anomalies in A Database Atomic Domain and 1NF ,Functional Dependency Theory, Decomposition Using Functional Dependency, Decomposition Using Multivalued Dependency More Normal Forms, Database Design Process.

UNIT-IV
Basic Concepts Of Indexing and Hashing, Query Processing , Measures Of Query Cost , Query Processing for Select, Sort, Join Operations. Basics of Query Optimization, Transformation of Relational Expression, Estimating Statistics of Expression, Choice of Evaluation Plan.

UNIT-V
Transaction Concepts, Features of Database Transaction. Concurrency Control in Database - Lock Base, Time Stamp Base, Validation Base Protocols Database Recovery System .

TEXT & REFERENCE BOOKS:

- *SILVERSCHATZ KORTH AND SUDARSHAN-DATABASE SYSTEM CONCEPTS, 6 TH ED. TATA MC-GRAW HILL.*
- *RAGHU RAMA KRISHNAN-DATABASE MANAGEMENT SYSTEMS, 2 ND ED. TATA MC-GRAW HILL*
- *RAJESH NARANG – DATABASE MANAGEMENT SYSTEM,2 ND ED.PHI*
- *R. ELMASRI ET. AL "FUNDAMENTALS OF DATABASE SYSTEMS". 3 RD EDITION – ADDISON WESLEY, (INDIAN REPRINT), NEW DELHI.*
- *C.J.DATE, DATA BASE SYSTEM*S, Vol I & II

Subject Name: Discrete Mathematics

Paper Code: BCA203

Unit-I:
Set Theory: Definition of sets, countable and uncountable sets, Venn Diagrams, proofs of some general identities on sets Relation: Definition, types of relation, composition of relations, Pictorial representation of relation, equivalence relation, partial ordering relation. Function: Definition, type of functions, one to one, into and onto function, inverse function, composition of functions, recursively defined functions. Notion of Proof: Proof by counter-example, the contra-positive, proof by contradiction, inductive proofs.

Unit-II:
Algebraic Structures: Definition, Properties, types: Semi Groups, Monoid, Groups, Abelian group, properties of groups, Subgroup, cyclic groups, Cosets, factor group, Permutation groups, Normal subgroup, Homomorphism and isomorphism of Groups, example and standard results, Rings and Fields: definition and standard results.

Unit-III:
Posets, Hasse Diagram and Lattices: Introduction, ordered set, Hasse diagram of partially, ordered set, isomorphic ordered set, well ordered set, properties of Lattices, and complemented lattices. Boolean Algebra: Basic definitions, Sum of Products and Product of Sums, Form in Boolean Algebra, Logic gates and Karnaugh maps. Graphs: Simple graph, multi graph, graph terminology, representation of graphs, Bipartite, Regular, Planar and connected graphs, connected components in a graph, Euler graphs, Hamiltonian path and circuits, Graph coloring, chromatic number, isomorphism and Homomorphism of graphs. Tree: Definition, Rooted tree, properties of trees, binary search tree, tree traversal.

Unit-IV:
Propositional Logic: Proposition, First order logic, Basic logical operation, truth tables, tautologies, Contradictions, Algebra of Proposition, logical implications, logical equivalence, predicates, Universal and existential quantifiers.

Unit-V:
Combinatorics: Basic Counting Technique, Pigeon-hole Principle, Recurrence Relation, Generating function, Polya's Counting Theorem

Text books and References:

1. Discrete Mathematics and Its Applications, By Kenneth H Rosen, McGraw Hill, Sept.2002.
2. Discrete Mathematical Structures with Applications to Computer Science, By J. P. Tremblay, R. Manohar, McGraw Hill Pub, 1975.
3. Graph Theory With Applications to Engineering and Computer Science, By Prentice Hall, Englewood Cliffs, N. J, 1974
4. Combinatorics: Theory and Applications, By V. Krishnamurthy, East-West Press Pvt. Ltd., New Delhi, 1986.

Subject Name: Environmental Studies

Paper Code: BCA 204

Unit 1:
Definition, scope and importance, Multimedisciplinary nature of environmental studies, need for public awareness.
Natural resources and associated problems:
(a) Forest resources: Use and overexploitation, deforestation timber extraction, mining, dams and their effects on forests and tribal people,
(b) Water resources: Use and over-utilization of surface and ground water, floods, drought, conflicts over water, dams-benefits and problems.
(c) Mineral resources: Use and exploitation, environmental effects of extracting and using mineral resources.
(d) Food resources: W orId food problems, changes caused by agriculture effects of modem agriculture, fertilizer-pesticide problems;
(e) Energy resources: Growing energy needs, renewable and non renewable energy sources, use of alternate energy sources.
(f) Land resources: land as resources, and land degradation, man induced landslides, soil erosion and desertification. Role of an individual in conservation of natural resources Equitable use of resources for Sustainable lifestyles.

Unit 2:
Concept of an ecosystem, Structure and function of an ecosystem, Producers,consumers and decomposers, Energy flow in the ecosystem, Ecological succession. Food chains, food webs and ecological pyramids, Introduction, types, Characteristic features, structure andfunction of 'the following ecosystem:
a) Forest ecosystem b) Grassland ecosystem c) Desert ecosystem
d) Aquatic ecosystems (ponds, streams, lakes, rivers, oceans, estuaries)

Unit 3:
Biodiversity and its conservation: Introduction-Definition: genetic, species and ecosystem diversity, Biogeographical classification of India, Value of biodiversity: consumptive use, productive use, social, ethical, aesthetic and option value, Biodiversity at global, national and local levels, India as a mega-diversity nation, Western ghat as a bio-diversity, Hot-spots of biodiversity, Threats to biodiversity: habitat loss, poachingof wildlife, man-wildlife Conflicts, Endangered and endemic species of India, Conservation of biodiversity: In-situ and Ex-situ, Conservation of biodiversity.

Unit 4:
Environmental Pollution: Definition, causes, effects and control measures of:
a) Air pollution
b) Water -pollution
c) Soil pollution
d) Marine pollution
e) Noise pollution
f) Thermal pollution
g) Nuclear hazards. Solid waste management causes, effects and control measures urban and industrial wastes, Role of an individual in prevention of pollution, Disaster management: folds, earthquake, cyclone and landslides,Tsunami.

Unit 5:
Social Issues and Environment: From Unsustainable to Sustainable development, Urban

problems related to energy, Water conservation, rain water harvesting, watershed management, Resettlement and rehabilitation of people; its problems and concerns, Environmental ethics: Issues and possible solutions, Climate change, global-warming, acid rain, ozone layer depletion, nuclear accidents and holocaust, Wasteland reclamation, consumerism and waste products, Environment protection Act, Air (Prevention and control of pollution) Act., Water (Prevention and control of pollution) Act., Wildlife protection act, Forest conservation Act, Issues involved in enforcement of environmental legislation public awareness.

Unit 6:
Human Population and the Environment: Population growth, variation among nations, Population explosion, Family welfare programme, Environment and human health, Value Education,Women and Child Welfare, Role of information technology in Environmental and human health.

Unit 7:
Field work: Visit to a local area to document environmental assetsriver /forest /grassland / hill / mountain., Visit to a local polluted site Urban / Rural / Industria / Agricultural, Study of common plants, insects, birds, Study of simple ecosystem-ponds, river, hill slopes, etc.

Text books and References:

1. S. Sinha, M. Shukla & R Shukla, Text book of Environmental studies AITBS Publishers, Delhi. (2005)
2. Agarwal, K.c., 2001 Environmental Biology, Nidi Publ. Ltd. Bikaner.
3. Bharucha Erach, The Biodiversity of India, Mapin publishing Pvt. Ltd. Ahmcdabad 380013, India Email: mapin@icenet.net. .
4. Brunner RC., 1989, Hazardous Waste Incineration, McGraw Hill Ine. 480p.
5. Clark RS. Marine pollution, Clanderson Press Oxford. .~
6. Cunningham, W.P. Cooper, T.H. Gorhani, E & Hepworth, M.T. 2001 Environmental Encyclopedia, Jaico Publ. House. Mumbai, 1196p.
7. De. A.K. Environmental Chemistry, Wiley Eastern Ltd.,
8. Down to Earth, Centre for Science and Environment.
9. Gleick, H.P. 1993 Water in crisis, pacific institute for studies in Dev. Environmental & Security. Stockholm Env. Institute. Oxford University press 473p.
10. Hawkins RE. Encyclopedia of Indian Natural History, Bombay Natural History Society, Bombay.
11. U. Jadhav H & Bhosle V.M. 1995 Environmental Protection and laws. Himalayas Pub. House Delhi, 284p
12. Mckinney M.L. & Schocl RM. 1996 Environmental Science systems & Solutions Web. Enhanced edition 639p.
13. Heywood, Vh & Watson RT. 1995 Global biodiversity Assement Cambridge Univ. press 1140p
14. Mhaskar A.K. Matter Hazardous Techno-Science Publications.
15. Miller T.G. Jr. Environment Science Wadsworth publishing co.
16. Odum E.P. 1971 Fundamental of Ecology W.B. Saunders Co. USA 574p
17. Rao M.N. & DataA.K. 1987 Waste Water treatment, Oxford and mH Publ. Co pvt, Itd 345p
18. Sbarma B.K. 2001 Environmental chemistry Goel Publ. House, Meerut.

19. Townsend C. Harper. J. and Michel Begon, Essesetials of Ecology Blackwell Science.
20. Trivedi R.K. Handbook of Environmental Laws, rules, guidelines, ompliances and Standards, Vol I and II Enviro Media.
21. Trivedi RK. and P.K. Goel introduction to air pollution, Techno-Science Publications. .
22. Wagner K.D. 1998 Environmental Management. W.B. Saundars Co. Philadelphia, U.S.A. 499p.

3rd Semester

Subject Name- Object Oriented Programming with C++

Paper Code: BCA 301

UNIT-I

Object Oriented Programming, Concepts, Advantages, Usage. C++ Environment: Program Development Environment,C++ language standards. Introduction to Various C++Compilers, C++ Standard Libraries, Prototype of main() Function, Datatypes. Classes & Objects- Classes, Structure & classes, Union & Classes, Friend Function, Friend Classes, Inline Function,, Scope Resolution Operator, Static Class Members, Static Data Member, Static Member Function, Passing Objects to Function, Returning Objects, Object Assignment.

UNIT-II

Array, Pointers References & The Dynamic Allocation operators Array of objects, Pointers to Object, Type Checking C++ Pointers, The This pointer, Pointer to Derived Types, Pointer to Class Members, Reference parameter, Passing references to Objects, Returning Reference, Independent Reference, 'C++ 'S Dynamic Allocation Operators, Initializing Allocated Memory, Allocating Array, Allocating Objects.

UNIT-III

Constructor & Destructor - Introduction, Constructor, Parameterized constructor, Multiple Constructor in a class, Constructor with Default Argument, Copy Constructor, Default Argument, Destructor, Function & Operator Overloading Function Overloading, Overloading Constructor Function Finding the address of an Overloaded function.

UNIT-IV

Operator Overloading: Creating a member, Operator Function, Creating Prefix & Postfix forms of the increment & decrement operation, Overloading the shorthand operation (i.e. +=,-=~., etc), Operator overloading restriction, Operator overloading using friend function, Overloading New & Delete, Overloading some special operators, Overloading [ ], ( ),-, comma operator, Overloading <<.

UNIT-V

Inheritance -Base Class Access Control, Protected Members, Protected Base Class Inheritance, Inheriting Multiple Base Classes, Constructors, Destructors & Inheritance, When Constructor & Destructor Function,Passing parameters to base Virtual base classes. Virtual functions & Polymorphism: Virtual function, Pure Virtual functions, Early vs. Late binding.

TEXT & REFERENCE BOOKS:

- *HERBERTZ SHIELD, "C++ THE COMPLETE REFERENCE "TMH PUBLICATION ISBN 0-07-463880-7*
- *R. SUBBURAJ, 'OBJECT ORIENTED PROGRAMMING WITH C++ VIKAS PUBLISHING HOUSE, NEW DELHI.ISBN 81-259-1450-1*
- *E. BALGUR USWAMY, "C++ " TMH PUBLICATION ISBN O-07-462038-X*
- *M. KUMAR 'PROGRAMMING IN C++" TMH PUBLICATIONS*
- *R. LAFORE, 'OBJECT ORIENTED PROGRAMMING C++"*

- *ASHOK . N. KAMTHANE, "OBJECT ORIENTED PROGRAMMING WITH ANSI & TURBO C++ ", PEARSON EDUCATION PUBLICATION,ISBN8J-7808- 772-3*

Subject Name: Software Engineering

Paper Code: BCA 302

UNIT - I

Software **:** Software Characteristics and Applications, Software Engineering - A Layered Technology, Software Process Models - Linear Sequential Model, Prototype & RAD Model, Incremental Model and Spiral Model. Project Metrics : Software Measurement–Size Oriented, Function Oriented Metrics, Extended Function Point Metrics.

UNIT - II

Software Project Planning: Objectives, Decomposition Techniques, and Empirical Estimation Models. Analysis Concept and Principles: Requirement Analysis, Analysis Principles.

UNIT – III

Design Concepts and Principles: Design Process, Design Concepts, Design Principles, Effective Modular Design, Human Computer Interface Design, Interface Design Guidelines.

UNIT - IV

S/W Quality Assurance : Quality Concepts, Reliability S/W Testing Models : S/W Testing Fundamentals, White and Black Box Testing, Basic Path Testing, Testing Strategies : Strategic Approach to S/W Testing, Unit Testing, Integration Testing, Validation Testing, System Testing.

UNIT - V

S/W Reuse : Reuse Process, Classification and Retrieving Components, Economics of S/W Reuse CASE : Introducing to CASE, Taxonomy of Case Tools.

TEXT & REFERENCE BOOKS :

• SOFTWARE ENGINEERING BY R.S.PRESSMAN

• AN INTEGRATED APPROACH TO SOFTWARE ENGINEERING BY PANKAJ JALOTE

Subject Name: Computer Networks

Paper Code: BCA 303

UNIT –I

Networking - Needs and Advantages, Network Hardware & Software, Types- Client, Server and Peers,Introduction to various types of servers. Wired & Wireless transmission, Baseband and Broadband transmission. Connectivity Devices: Modem, Repeater, Hub, bridge Gateway.

UNIT-II

Transmission Media Types- Properties & Specialty of Various Media Types,Comparative Study. Network Topology-Bus, Star, Ring, Star Bus, Star Ring,Mesh Features, Advantages and Disadvantages of Each Type, Network Adapters Cards, Switching Techniques.

UNIT –III

The Theoretical Network Model – OSI, Introduction to IEEE 802 standards, Ethernet, Token Rings, FDDI, Network Scaling-No. of nodes, distance, software, speed, special requirements ,

UNIT –IV

Overview of TCP/IP reference model. Protocols- IP, TCP, UDP, ARP, SNMP, FTP, SMTP, TELNET Protocols, IP Addressing Class A, B & C. Domain Name Addressing, URL, E-mail address.

UNIT-V

Network Security : Network Security Issues, Security Barriers Needs Firewalls and Features of Firewalls, Types of Firewall Technology, Network Level and Application Level, IP Packets Filter Screening Routers, Limitations of Firewalls.

TEXT & REFERENCE BOOKS:

• *NETWORKING ESSENTIALS:STUDY GUIDE MCSE AMES CHEWS CHARLES PERKINS, MATTHEW STREBE BPB PUBLICATIONS.*

• *LOCALAREA NETWORKS'S.K.BASANDRA & S. JAISWAL, , GALGOTIA PUBLICATIONS*

•*COMPUTER NETWORK ANDREW & T ANENBAUM,*

• *DATA AND COMPUTER COMMUNICATION WILLIAM STERLING*

• *DATA COMMUNICATION BY PRAKASH C GUPTA*

Subject Name : Computer Organization & Architecture

Paper Code: BCA 304

UNIT-I

Introduction - Organization and Architecture, Structure and Function Computer Evolution and Performance - A Brief History of Computers, Designing for Performance, Pentium and Power PC Evolution. System Buses - Computer Components, Computer Function, Interconnection Structures, Bus Interconnection, PCI, Future bus.

UNIT-II

Internal Memory - Computer Memory System Overview, Semiconductor Main Memory, Cache Memory, Advanced DRAM organization. External Memory - Magnetic Disk, RAID, Optical Memory, Magnetic Tape. Input / Output - External Devices, I/O Modules, Programmed I/O, Interrupt-Driven I/O,DMA,I/O channels and Processors, The External Interface. Operating System Support - Operating System Overview, Scheduling, Memory Management.

UNIT-III

Computer Arithmetic - ALU, Integer Representation, Integer Arithmetic, Floating - Point Representation, Floating - Point Arithmetic Instruction Sets: Characteristics and Functions -Machine Instruction Characteristics, Types of operands, Types of Operations, Assembly Language. Instruction Sets - Addressing, Instruction Formats.

UNIT-IV

CPU Structure and Function - Processor Organization, Register Organization, The Instruction Cycle, Instruction Pipelining, The Pentium Processor, The PowerPC Processor. RISC - Instruction Execution Characteristics, The use of a Large Register File, Compiler Based Register Optimization, Reduced In-struction Set Architecture, RISC Pipelining, Motorola 88510, MIPS R4650, The RISC versus CISC Controversy.

UNIT-V

Superscalar Processors - Overview, Design Issues, PowerPC, Pentium Control Unit Operation - Micro-Operation, Control of the CPU, H/W Implementation. Microprogrammed Control - Basic Concepts, Microinstruction Sequencing, Microinstruction Execution, TI 8800, Applications of Microprogramming.

TEXT & REFERENCE BOOKS:

- *William Stallings, " Computer Organization and Architecture ", PHI , Fourth Edition, 1997.*
- *V.Carl Hamacher, ZvoKog G.Vranesic and Safwat G.Zaky, "COMPUTER ORGANIZATION", McGraw-Hill, ISE, 1984.*
- *M.Morris Mano, "COMPUTER SYSTEMS ARCHITECTURE" ,PHI, Third Edition , 1997.*

4th Semester

Subject Name: Programming with Java

Paper Code: BCA 401

UNIT-I
C++ Vs JAVA, JAVA and Internet and WWW, JAVA support systems, JAVA environment, JAVA program structure, Tokens, Statements, JAVA virtual machine, Constants & Variables, Data Types, Type Casting, Operators ,Expressions & its Evaluation, Decision making and branching, Loops, Jumps in Loops, Labeled Loops.

UNIT-II
Defining a class, Adding variables and methods, Creating objects, Accessing class members, Constructors, Method overloading , Static members, Nesting of methods, Inheritance: Extending a class, Overriding methods, Final variables and method~, Final classes, Finalizes methods, Abstract methods and classes, Visibility control.

UNIT-III
Arrays, One dimensional & two dimensional, Strings, Vectors, Wrapper classes, Defining interfaces, Extending interfaces, Implementing interfaces, Accessing interface Variables, System packages, Using system packages, Naming conventions, Creating packages, Accessing a package, Using package, Adding a class to a package, Hiding classes.

UNIT-IV
Threads, Creating threads, Extending the threads class, Stopping and blocking a thread, Life cycle of a thread, Using thread methods, Thread exceptions, Thread priority, Synchronization, Implementing the runnable Interface.

UNIT-V
Applets, Local and remote applets, Applets Vs applications, Writing applets, Applets life cycle, Creating an executable applet, Designing a web page, Applet tag, Adding applet to HTML file, Running the applet, Passing parameters to applets, Aligning the display, HTML tags & applets, Getting input from the user interface.

TEXT & REFERENCE BOOKS:

- *PROGRAMMING JAVA 2ND EDITION BY E. BALAGURUSWAMY, TMH PUBLICATIONS.*
- *Java: The Complete Reference, Seventh Edition byHerbert Schildt, McGraw Hill*
- *PETER NORTON QUID E T O JAVA PROGRAMMING BY PETER NORTON, T ECHMEDIA PUBLICATIONS.*

Subject Name: Operating System

Paper Code: BCA 402

UNIT-I
Definitions, functions and types of operating system, components, Operating system Services, System Calls, programs, System structure.

UNIT –II
Process Concepts, process state & process control block, Process Scheduling, Scheduling Criteria, Scheduling Algorithms, MultipleProcessor Scheduling Real-Time Scheduling, Threads.

UNIT –III
Critical Section Problem , Semaphores, Classical Problem Of Synchronization, , Deadlock Characterizations, Method for Handling,Deadlocks, Deadlock Prevention, Deadlock Avoidance, Deadlock Detection, Recovery from Deadlock .

UNIT –IV
Logical versus physical address space, Swapping, Contiguous Allocation, Paging, Segmentation, Virtual Memory, Demand Paging, Page Replacement, Page Replacement Algorithms.

UNIT –V
Disk Scheduling, Disk Management, Swap Space Management, Disk. reliability, Stable Storage Implementation. File Concepts Directory structure, Protection, File system in Linux.

TEXT & REFERENCE BOOKS:

• *OPERATING SYSTEM CONCEPTS BY SILBERSCHATZ & GALVIN, ADDISON EDITION.*
• *OPERATING SYSTEM CONCEPTS & DESIGN BY MILAN MILEN KOVIC, WESLEY PUBLICATION 6*
• *OPERATING SYSTEM CONCEPTS & DESIGN BY MILAN MILEN KOVIC,TMH PUBLICATION*

Subject Name: Programming with VB.Net

Paper Code: BCA 403

UNIT –I
Introduction to .NET, .NET Framework features & architecture, CLR, Common Type System, MSIL, Assemblies and class libraries. Introduction to visual studio, Project basics, types of project in .Net, IDE of VB.NET- Menu bar, Toolbar, Solution Explorer, Toolbox, Properties Window, Form Designer, Output

Window, Object Browser. The environment: Editor tab, format tab, general tab, docking tab. visual development & event drive Programming -Methods and events.

UNIT –II

The VB.NET Language- Variables -Declaring variables, Data Type of variables, Forcing variables declarations, Scope & lifetime of a variable, Constants, Arrays, types of array, control array, Collections, Subroutines, Functions, Passing variable Number of Argument Optional Argument, Returning value from function. Control flow statements: conditional statement, loop statement. Msgbox & Input box.

UNIT-III

Working with Forms: Loading, showing and hiding forms, controlling One form within another.GUI Programming with Windows Form: Textbox, Label, Button, Listbox,Combobox, Checkbox, PictureBox, RadioButton, Panel, scroll bar, Timer, ListView, TreeView, toolbar, StatusBar.There Properties, Methods and events. OpenFileDilog, SaveFileDialog, FontDialog, ColorDialog,PrintDialog. Link Label. Designing menues: ContextMenu, access & shorcut keys.

UNIT-IV

Object oriented Programming: Classes & objects, fields Properties,Methods & Events, constructor, inheritance. Access Specifiers: Public Private, Projected. Overloading, My Base & My class keywords. Overview of OLE, COM technology & .NET.

UNIT –V

Database programming with ADO.NET Overview of ADO, from ADO to ADO.NET, Accessing Data using Server Explorer. Creating Connection, Command, Data Adapter and Data Set with OLEDB and SQLDB. Display Data on data bound controls, display data on data grid.

TEXT & REFERENCE BOOKS:

- *VB.NET PROGRAMMING BLACK BOOK BY STEVEN HOLZNER DREAMTECH PUBLICATIONS*
- *MASTERING VB.NET BY EVANGELOS PET ROUTSOS- BPB PUBLICATIONS*
- *INTRODUCTION TO .ZVET FRAMEWORK -WORX PUBLICATIONMSDN. MICROSOFT.COM/ NET WWW.GOTDOTNET. COM*

5th Semester

Subject Name: Linux & Shell Programming

Paper Code: BCA 501

UNIT – I

Linux introduction and file system - Basic Features, Different flavors of Linux. Advantages, Installing requirement, Basic Architecture of Unix/Linux system, Kernel, Shell. Linux File system-Boot block, super block, Inode table, data blocks, How Linux access files, storage files, Linux standard directories. Commands for files and directories cd, ls, cp, md, rm, mkdir, rmdir, pwd, file, more, less, creating and viewing files using cat, file comparisons – cmp & comm, View files, disk related commands, checking disk free spaces. Partitioning the Hard drive for Linux, Installing the Linux system, System startup and shut-down process.

UNIT–II

Essential linux commands Understanding shells, Processes in linux - process fundamentals, connecting processes with pipes, Redirecting input output, manual help, Background processing, managing multiple processes, changing process priority with nice, scheduling of processes at command, cron commands, kill, ps, who, sleep, Printing commands, touch, file related commands - wc, cut, dd, etc. Mathematical commands- bc, expr. Creating and editing files with vi & vim editor.

UNIT–III

System administration: Common administrative tasks, configuration and log files, Role of system administrator, Managing user accounts-adding & deleting users, changing permissions and ownerships, Creating and managing groups, modifying group attributes, Temporary disable user's accounts, creating and mounting file system, file security & Permissions, becoming super user using su. Getting system information with uname, host name, disk partitions & sizes, users, kernel. Backup and restore files, installing and removing packages with rpm command. KDE & Gnome graphical interfaces.

UNIT–IV

Shell programming- Basic of shell programming, Various types of shell available in Linux, comparisons between various shells, shell programming in bash, read command, conditional and looping statements, case statements, parameter passing and arguments, Shell variables, system shell variables, shell keywords, Creating Shell programs for automate system tasks. Simple filter commands – pr, head, tail, cut, paste, sort, uniq, tr. Filter using regular expressions – grep, egrep, and sed.

UNIT-V

Basic networking administration: Setting up a LAN using Linux, choosing peer to peer vs client/server model, setting up an Ethernet Lan, configuring host computers, checking Ethernet connecting, connecting to Internet, common networking administrative tasks, configuring Ethernet, initializing Ethernet Interface, ifconfig, netstat and netconfig commands, TCP/IP network, DNS services, routing using Linux
Installation & Administration of mail server, ftp server and Apache web server.

TEXT & REFERENCE BOOKS:

• *UNIX - CONCEPTS & APPLICATIONS (THIRD ED.) - SUMITABHA DAS, T ATA MCGRAW HILL PUBLICATIONS.*
• *UNIX FOR PROGRAMMERS AND USERS (THIRD ED.) - GRAHAM GLASS & KING ABLES, PEARSON EDUCATION INDIA.(LOW PRICES EDITION).*
• *FEDORA CORE 6 BIBLE*
• *RED HAT LINUX 9 BIBLE – CRISTOPHER NEGUS, IDG BOOKS INDIA LTD.*
• *USING LINUX BY JACK T ACKETT, DAVID GUNTER, PHI, EEE EDITION*
• *LINUX INSTALLATION AND ADMINISTRATION, NICHOLAS WELLS, COURSE TECHNOLOGY (VIKAS PUBLISHING, NEW DELHI).*
• *UNIX SHELL PROGRAMMING - YASHWANT KANETKAR, BPB PUBLICATIONS,*
• *RED HAT LINUX UNLEASHED T ECHMEDIA (BPB PUBLICATIONS)*
• *LINUX NETWORKING AND SECURITY - WELLS, COURSE T ECHNOLOGY (VIKAS PUBLISHING, NEW DEIHI*

Subject Name: PHP Programming

Paper Code: BCA 502

Unit-I

Introduction to PHP, History of PHP, Versions of PHP, Features of PHP, Advantages of PHP over Other Scripting Languages, Installation and Configuration of PHP, Data Types in PHP, PHP Syntax, Comments, PHP Variables and Constants, Scope of Variables, PHP String, String Manipulation, PHP Operators, Precedence of Operators, Expressions, Creating a PHP Script, Running a PHP Script.

Unit-II

Basic HTML, Embedding PHP in HTML, Passing Information between Pages, PHP $_GET, PHP $_POST, PHP Conditional Statements, PHP Looping Statements, Break, Continue, Exit, PHP Functions: Built-in and User Defined Function, Regular Expression Functions, Mathematical, Date and Time Functions, PHP Arrays: Creating Array and Accessing Array Elements.

Unit-III

PHP File Permissions, Working with Files: Opening, Closing, Reading, Writing a File; Working with Directory: Creating, Deleting, Changing a Directory; Working with Forms: Introduction to a Web Form, Processing a Web Form, Validating a Web Form, Input Validation, PHP with Client Side Scripting Language, Exception and Error Handling in PHP, Introduction to Cookies and Session Handling.

Unit-IV

Working with Database: PHP-Supported Databases; Using PHP & My SQL: Installation and Configuration of My SQL 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, File System Functions and File Input and Output, File Uploads, Use of CSS, Introduction to Object Oriented Programming with PHP, Installing and Configuring Apache to use PHP on Windows, php.ini File.

TEXT & REFERENCE BOOKS:

• *PHP & MY SQL, BY VIKRAM VASWANI, TMH PUBLICATIONS*
• *PHP ESSENTIALS, BY JULIE C. MELONI, BPB PUBLICATIONS*
• *PHP 5 AND MY SQL BIBLE, BY TIM CONVERSE AND JOYCE PARK, WILEY-DREAMTECH INDIA PUBLICATIONS*
• *WEB TECHNOLOGIES, BLACK BOOK, DREAMTECH PRESS*
• *ATKINSON, LEON. CORE PHP PROGRAMMING, NEW YORK: PRENTICE HALL*
• *LEARNING PHP 5, BY DAVID SKLAR PUBLISHER O'REILLY MEDIA*
• *MASTERING PHP, BY CHARLES, PUBLISHER: BPB*
• *EXPERT PHP AND MYSQL, WROX PROGRAMMER TO PROGRAMMER, WROX PRESS, 2010*
• *PHP FOR ABSOLUTE BEGINNERS, APRESS, 2009*
• *SAMS TEACH YOURSELF CSS IN 24 HOURS (2ND EDITION), SAMS PUBLISHING, 2006*
• *HTTP:// WWW.PHPBUILDER.COM*

Subject Name: Internet & E-Commerce

Paper Code: BCA 503(A)

UNIT-I
E-Commerce an Introductions, Concepts, Advantages and Disadvantages, Technology in E-Commerce, Benefits and impact of E-commerce on travel industry, Goals of E-Commerce, Difference between E-Commerce and E-Business, Models of E-Commerce,Limitations and Advantages of E-Commerce.

UNIT-II
Electronic Payment Systems- Introduction, Types of Electronic Payment Systems, Electronic Payment Systems, Smart Cards and Electronic Payment Systems, Credit Card-Based Electronic Payment Systems, Risk and Electronic Payment Systems.

UNIT-III
E-Security Network and Web Site Risk for E-Business, Information Technology Act 2000 and its Highlights Related to E-commerce, E-Security,Firewalls, Electronic Market / E- Shop, Introduction to Security, Types of Securities, Security Tools, Network Security.

UNIT-IV
E-Governance, E-democracy, Government Efforts to Encourage Citizen Participation, Privacy and Security Issues, Information Security Management Digital Divide. Applications in Governance, E-government, Government –to- business, Business-to-Government and Citizen-to-Government,E-Governance Models.

UNIT-V
Introduction of Cyber Crime, Categorizing Cyber Crime, Information Warfare- Concept, information as an Intelligence Weapon, Attacks and Retaliation, Attack and Defense. Cyber Law.

TEXT & REFERENCE BOOKS:

• *FRONTIERS OF ELECTRONIC COMMERCE, BY- KALAKOTA, RAVI; STONE, TOM; WHINSTON, ANDREW B, ADDISON WESLEY PUBLISHING CO, ISBN 8178080575*
• *E-COMMERCE AN INDIAN PERSPECTIVE BY P. TJOSEPH, S.J. PRENTICE-HALL OF INDIA*

Subject Name: Artificial Intelligence

Paper Code: BCA 503(B)

Unit I

Introduction to the object and goal of artificial intelligence: Aim and scope of the artificial intelligence, problem space and problem characteristics, state space representation.

Unit II

Problem Solving Techniques: Generate and test, hill climbing, search problem reduction techniques, constraint propagation, means-end-analysis, heuristics search techniques and heuristic problem solving.

Game Playing: And or graph search, game trees and associated techniques, minimax and alpha beta pruning. Some case studies

Unit III

Knowledge representation and inferencing : Procedural and deductive approaches production system formalism, predicate logic (first order and second order), Rule based system, schematics net conceptual dependencies, conceptual path, frames, scripts associated inferencing mechanism. Resolution in predicate logic, unification , natural deduction theorem proving, forward and backward deduction.

Unit IV

Uncertainity: Different techniques for reasoning under uncertainty, monotics and non monotic reasoning. Constraint satisfaction problem.

Unit V

Learning: Introduction, Empiricist Algorithm, Matching Algorithm, Failure driven learning, Learning Languages

Reference Books:

1. Artficial Intelligence By Patrick,Henry,Winston , Pearson Education
2. Artificial Intelligence By Rich and Night
3. Introduction to Artificial Intelligence By Charniak, Mc Dermott, Pearson Education

Subject Name: Financial Accounting

Paper Code: BCA 504

UNIT–I
The Basic-Financial Accounts, Types of Accounts, Rules of Entries of Transaction, Journal, Ledger, Posting of Entries Balance The Balance Sheet and Profit - Loss Statement

UNIT-II
Cash Book- Types, Format of Cash Book, Balancing of Cash Book Subsidary Books- Purchase, Sales, Purchase Return and sale return Depreciation and Inflation

UNIT–III
Principles of Cost Accounting, Valuation of Stock, Allocation of Overheads, Standard Costing, Various Costing

UNIT-IV
Pay roll department, Preparation of pay roll, Preparation of wage record Discuss computer method

UNIT-V
Inventory account and store record, Inventory or stock control and cost accounting, Department demand and supply method of stock control Classification and condition of material Report on material handling
Discuss computer method-overview of computerized accounting

TEXT & REFERENCE BOOKS :

- Mazda, **Engineering Management**, 1st Edition, 2000, Addisen Wesley
- Dr. S.P. Gupta, **Management Accounting**
- I.M. Pandey, **Financial Management**, 8th Edition, 1999, Vikas Publication

6th Semester

Subject Name: Major Project
Credit:20 Marks:500