Syllabus for

Applied Mathematics- III (IT/CE)

Scheme (Theory: 4 hrs, Tutorial: 1 hr)

UNIT - I: LAPLACE TRANSFORM(14 Hrs)

Definition, Properties, Laplace Transform of Derivatives and Integrals, Evaluation of Integrals by Laplace Transform, Inverse Laplace Transform and its Properties, Convolution Theorem(Statement Only), Laplace Transform of Periodic Functions(Statement Only) and Unit Step Function, Applications of Laplace Transform to solve Ordinary Differential Equations, Simultaneous Differential Equations, Integral Equations & Integro-Differential Equations.

UNIT – II: FOURIER TRANSFORM (06 Hrs)

Definition and Properties(excluding FFT), Fourier Integral Theorem, Relation with Laplace Transform, Applications of Fourier Transform to Solve Integral Equations.

UNIT – III: Z-TRANSFORM(08 Hrs)

Definition, Convergence of Z-transform and Properties, Inverse Z-transform by Partial Fraction Method, Power Series Expansion, Convolution of two sequences.Solution of Difference Equations with Constant Coefficients by Z-transform method.

UNIT –IV: MATRICES (12 Hrs)

Linear and Orthogonal Transformations, Linear dependence of vectors, Characteristics equation, Eigen values and Eigen vectors, Statement and Verification of Cayley-Hamilton Theorem [without proof], Reduction to Diagonal form, Reduction of Quadratic form to Canonical form by Orthogonal Transformation, Sylvester's Theorem[without proof], Solution of Second Order Linear Differential Equation with Constant Coefficients by Matrix method. Largest Eigen value and Eigen vector by Iteration method.

UNIT – V: THEORY OF PROBABILITY (10 Hrs)

Axioms of Probability, Conditional probability, Baye's Rule, Random variables: Discrete and Continuous random variables, Probability function and Distribution function, Joint distributions, Independent Random Variables, Conditional Distributions.

UNIT – VI: MATHEMATICAL EXPECTATION & STOCHASTIC PROCESS(10 Hrs)

Mathematical Expectation, Variance, Standard Deviation, Moments, Moment generating function, Covariance & Correlation Coefficient, Conditional expectation. Stochastic process: Bernoulli and Poisson process.

Text Books

1. Higher Engineering Mathematics by B.S. Grewal, 40th Edition, Khanna Publication.
2. Advanced Engineering Mathematics by Erwin Kreysizig, 8th Edition, Wiley India.
3. Applied Mathematics for Engineers & Physicist by L. A. Pipes and L. R. Harvill.
4. Theory & Problems of Probability and Statistics by M. Spiegel , Schaum's Series, McGraw Hill .
5. Probability and Statistics for Engineers by Miller, Freund and Johnson, 4th ed.PHI.

Reference Books

1. A Text Book of applied Mathematics, Volume II , by P.N. Wartikar & J.N. Wartikar, Poona Vidyarthi Griha Prakashan
2. Introductory methods of Numerical Analysis, by S.S. Sastry, PHI
3. Mathematics for Engineers by Chandrika Prasad
4. Probability, Statistics with Reliability, Queuing and Computer Science Applications by K. S. Trivedi.
5. Probability, Statistics and Randam Processes by T. Veerarajan, Mc Graw-Hill .
6. A text book of Engineering Mathematics by N. P. Bali & M. Goyal, Laxmi Publication.

BEIT302T PROGRAMMING LOGIC AND DESIGN USING 'C'

(Theory Credit: 05)

Teaching Scheme:	Examination Scheme:
Lecture: 4 Hours/week	Theory: T (U): 80 Marks T (I): 20 Marks
Tutorial: 1 Hour/week	Duration of University Exam. : 03 Hours

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UNIT I:

Introduction and Structure of 'C' Programming: Algorithms and Flowchart, Characteristics of algorithm, Basic Techniques, Decision Making, Looping Technique, Multiway Decision Making. Examples through 'C'.

UNIT II:

Function and Pointers: Introduction to functions, why use function, Scope rule of function, call by value, call by reference, recursion, Iterative versus recursive style, Storage Classes in C. Preprocessor Directives in 'C': Macro, File Inclusion. Array: one dimensional array, pointer and array, Searching (Linear and Binary) and Sorting (Selection, Bubble, Insertion). Array of pointers, multidimensional array (2-D array).

UNIT III:

String and Structure: Introduction to string, pointers and strings, standard library function and user defined function, two dimensional array of character, array of pointer to string, limitation. Structure: Declaration, Accessing and memory representation of structure, array of structure, additional features of structure, pointer to structure. Union: Introduction, difference between structure and union, union of structure.

UNIT IV:

Console and File I/O: Types of I/O, console I/O functions, File I/O: data organization, file operation, file opening modes, file copy programming, String I/O files, Text file and binary file, low level disk I/O, Command line argument, detecting errors in reading / writing. Bitwise operators, Enumerated data types, typedef, typecasting, bit-field operator, volatile qualifier.

UNIT V

Dynamic memory allocation and Graphics in 'C': Malloc(), Calloc(), free(), realloc(), Sizeof() operator. Setting Text mode: textmode(), textbackground(), textcolor(), gotoxy(), cputs().Setting Graphics Mode: Drawing a Point on Screen, Drawing – lines, rectangle, circles, arcs, polygon. Functions to fill colors. Display Text in Graphics mode, outtext(), outtextxy(), justifying text. Computer animation: getimage (), putimage (), imagesize().

UNIT VI:

Advanced Concept in 'C: Different types of pointers, ROM – BIOS function, Elementary TSR's.

Text Books:

1. Programming Techniques Through 'C' : M. G. Venkateshmurthy (Pearson)
2. LET US 'C : Yashwant P. Kanetkar. (BPB).
3. Graphics Under C: Yashwant Kanetkar (BPB).
4. Writing TSR'S through 'C': Yashwant Kanetkar (BPB).
5. Programming in 'C': Ashok N. Kamthane (2nd Edition[Pearson])

Reference Books:

1. The Complete Reference C (4th Edition): Herbert Schildt [TMH]
2. The C Programming Language: Dennis Ritchie & Brain Kernighan [Pearson]
3. Programming with C : K.R.Venugopal & S.R.Prasad [TMH]
4. Programming in C: B. L. Juneja and Anita Seth (cengage learning)
5. A First Course in Programming with 'C': T. Jeyapoovan (Vikas)

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BEIT302P PROGRAMMING LOGIC AND DESIGN USING 'C'

(Practical Credit: 01)

Teaching Scheme:	Examination Scheme:
Practical: 2 Hours/ week	Practical: P (U): 25 Marks P (I): 25 Marks
	Duration of University Exam. : 02 Hours

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Note:

1. Practicals are based on PROGRAMMING LOGIC AND DESIGN USING 'C' syllabus (subject code: BEIT302T)
2. Practicals have to be performed using 'C' language
3. There should be at the most two practicals per unit
4. Minimum ten practicals have to be performed
5. Do not include study experiments

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BEIT303T ETHICS IN INFORMATION TECHNOLOGY

(Theory Credit: 04)

Teaching Scheme:	Examination Scheme:
Lecture: 3 Hours/ week	Theory: T (U): 80 Marks T (I): 20 Marks
Tutorial: 1 Hour/ week	Duration of University Exam. : 03 Hours

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UNIT I:

An overview of Ethics: Ethics in business world, Ethics in IT, Ethics for IT professionals and IT users, IT professionals, Ethical behavior, IT professional malpractices, IT users.

UNIT II:

Computer and Internet Crime: IT security incidents: Increasing Complexity Increases Vulnerability, Higher Computer user Expectations, Expanding and changing systems. Introduces new risks, Increased Reliance on Commercial Software with known Vulnerabilities, Types of Exploits, Perpetrators, Reducing Vulnerabilities, Risk Assessment, Establishing a Security Policy, Educating Employees, contractors and part-time Workers, Prevention, Detection, Response.

UNIT III:

Privacy: The right of Privacy, Recent History of Privacy Protection, Key Privacy and Anonymity issues, Governmental Electronic Surveillance, Data Encryption, Identity Theft, Consumer Profiling, Treating Consumer Data Responsibility, Workplace Monitoring, Advanced surveillance Technology, Defamation, Freedom of Expression: Key issues, Controlling Access to Information on the Internet, Anonymity, National, Security Letters, Defamation and Hate Speech.

UNIT IV:

Intellectual Property: Copyrights, Patents, Trade Secret Laws, Key Intellectual Property Issues, Plagiarism, Reverse Engineering, Open Source Code, Competitive Intelligence, Cyber squatting, Software Development, Strategies to Engineer Quality Software, The Importance of Software Quality, Software Development Process, Capability Maturity Model Integration for Software, Key Issues in Software Development, Development of Safety-Critical Systems, Quality Management Standards.

UNIT V:

Ethics of IT Organization: Need for Nontraditional Workers, Contingent Workers H-IB Workers, Whistle-blowing, Protection for Whistle-Blowers, Dealing with Whistle-Blowing Situation.

UNIT VI:

The Impact of Information Technology on the Quality of Life: The impact of IT on the standard of Living and productivity, the Digital Divide, The impact of IT on Health care costs, Electronic Health Records, Use of Mobile and Wireless Technology, Telemedicine. Medical Information Wet Sites for lay people.

Text Books:

1. George Reynolds, “Ethics in information Technology” Cengage Learning

Reference Books:

1. Deborah G.Johnson,"Computer Ethics",3/e Pearson Education.
2. Sara Baase, "A Gift of Fire: Social, Legal and Ethical Issues, for Computing and the Internet," PHI Publications.
3. Richard A.Spinello, "Case study in Information Technology Ethics", second Edition PHI Publications.
4. Duncan Lanford "Internet Ethics".
5. D. Micah Hester and Paul J. Ford "Computer and Ethics in the Cyber age".

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BEIT304T DIGITAL ELECTRONICS AND FUNDAMENTALS OF MICROPROCESSOR
(Theory Credit: 05)

Teaching Scheme:	Examination Scheme:
Lecture: 4 Hours/ week	Theory: T (U): 80 Marks T (I): 20 Marks
Tutorial: 1 Hour / week	Duration of University Exam. : 03 Hours

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UNIT I:
Analog Vs. Digital Systems, Boolean Algebra, D' Morgan's Laws. Types of Number System: Decimal, Binary, Octal, Hex, Type of Codes: Reflected (Gray), Self Complementary (Excess-3), BCD and ASCII codes, Conversion of Codes, Gates and their truth tables.

UNIT II:
Forms of Expression: Sum of products and Product of Sums, Standard Sum of products and Product of Sums, Minterms and Maxterms, Canonical Sum of products and Product of Sums. Karnaugh map: simplification of functions using K-map (up to 5 variables) and their implementation using logic gates.

UNIT III:
Combinational Circuits: Decoders, Encoders. Priority Encoder, Multiplexers, Demultiplexers, Code converters. Implementation of Functions using Decoder. Arithmetic Circuits: Adder (Half and Full), Subtractor (Half and Full). BCD adder / Subtractor, Concept of ALU.

UNIT IV:
Types Flip Flops: SR, JK, Master Slave JK, D and T. Race around Condition (Racing) and Toggling. Characteristics Table and Excitation Table, Conversion of Flip-Flop. Sequential Circuits: Counters, Modulus of Counter, Types- Synchronous Counter and Asynchronous (Ripple) counter.

UNIT V:
8085 microprocessor architecture, addressing modes, instruction sets.

UNIT VI:
Interrupts, Basic memory organization, Timing diagram, Programming in 8085.

Text Books:

1. Modern digital Electronics- R. P. Jain, McGraw Hill.
2. Digital Integrated Electronics- Herbert Taub, McGraw Hill.
3. Digital Logic and Computer Design- Morris Mano (PHI).
4. Digital Integrated Electronics- Herbert Taub, McGraw Hill.
5. Digital Electronics Logic and System – James Bingnell and Robert Donovan, Cengage Learning
6. Digital Circuits & Systems by K.R.Venugopal & K. Shaila
7. 8 bit Microprocessor by Ramesh Gaonkar.
8. 8 bit microprocessor & controller by V. J. Vibhute, Techmak Publication.
9. 8085 Microprocessor & its Applications by A. Nagoor Kani, McGraw Hill.

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BEIT304P DIGITAL ELECTRONICS AND FUNDAMENTALS OF MICROPROCESSOR
(Practical Credit: 01)

Teaching Scheme:	Examination Scheme:
Practical: 2 Hours/ week	Practical: P (U): 25 Marks P (I): 25 Marks
	Duration of University Exam. : 02 Hours

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Note:

1. Practicals are based on DIGITAL ELECTRONICS AND FUNDAMENTALS OF MICROPROCESSOR syllabus (subject code: BEIT304T)
2. There should be at the most two practicals per unit
3. Minimum ten practicals have to be performed
4. Do not include study experiments

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BEIT305T DATA COMMUNICATION

(Theory Credit: 05)

Teaching Scheme:	Examination Scheme:
Lecture: 4 Hours/ week	Theory: T (U): 80 Marks T (I): 20 Marks
Tutorial: 1 Hour/ week	Duration of University Exam. : 03 Hours

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UNIT I:

Data Communication: Communication Model, Data Representation, Data Flow (Simplex, Half duplex, Full duplex), Communication networking.

UNIT II:

Protocol Models: Need for protocol architecture, OSI Model fundamentals, TCP/IP Model fundamentals, addressing (Physical, Logical, Port addressing).

UNIT III:

Physical Layer and Media: Data and Signals, Analog and Digital, Periodic Analog Signals, Digital Signals, Transmission impairment, Data Rate Limits, Performance, Digital Transmission, Digital-to-Digital Conversion(Line Coding & Block coding), Analog-to-Digital Conversion(PCM & DM), Transmission Modes(Parallel & Serial).

UNIT IV:

Analog Transmission and Multiplexing: Analog Transmission, Digital-to-analog Conversion (ASK, FSK, PSK & QAM), Analog-to-analog Conversion (AM, FM & PM), Multiplexing (Frequency Division Multiplexing and Time Division Multiplexing), Switching:-switching networks, circuit switching, and Packet switching.

UNIT V:

Communication Media: Transmission Media: Guided media (Twisted pair, Co-axial cable, Optical fiber), Connectors (Twisted pair, Co-axial cable, Optical fiber), Unguided Media (Radio, microwave, satellite, Infrared).

UNIT VI:

Local Area Networks: The Basics (Topologies, hub, Switch, Bridges, Gateway), Local Area Networks- Internetworking, Local Area Networks- Software and support System, Introduction to Metropolitan Area Networks and Wide Area Network, Internet.

Text Books:

1. Data Communications and Networking By A. Behrouz Forouzan, 4th edition, TMH publication
2. Data Communications and Networking, 1/e, Curt White, CENGAGE Learning, ISBN: 9788131505571.

Reference Books:

1. Data and Computer Communications, William Stallings, Seventh Edition, Pearson Prentice Hall.
2. Electronics Communication Systems by G. Kennedy, 5th edition, TMH
3. Analog and Digital Communication By T.L. Singal, TMH

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BEIT306T ENVIRONMENTAL ENGINEERING

(Total Credits: Nil)

Teaching Scheme:	Examination Scheme:
Lecture: 2 Hours/ week	Theory: (Audit Course)

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UNIT I: Introduction:

Definition, scope and importance; Need for public awareness institution in environment, people in environment

UNIT II: Natural Resources:

Renewable and non-renewable and associated problem; Role of an individual in conservation of natural resources; equitable use of resources for sustainable lifestyles

UNIT III: Ecosystems:

Concept of an ecosystem – understanding ecosystrem, ecosystem degradation, resource utilization Structure and function of an ecosystem- producers, consumers and decomposers, Energy flow in the ecosystem – water, carbon, oxygen, nitrogen, and energy cycle, integration of cycles in nature Ecological Succession; Food chains ,food webs and ecological pyramids ;Ecosystem types- Characteristic features structure and function of forest ,grassland ,desert and aquatic ecosystems.

UNIT IV: Bio-diversity:

Introduction – biodiversity at genetic, species and ecosystem levels Bio-geographic classification of India Value of biodiversity- consumptive use value, productive use value, social, ethical, moral, aesthetic and optional value of biodiversity. India as a mega – diversity nation; hotspots of biodiversity Threats to bio-diversity –habitat loss, poaching of wildlife, man-wild life conflicts. Common endangered and endemic plant and animal species of india. Insitu and Exsitu conservation of biodiversity.

UNIT V: Pollution:

Definition; causes effects and control measures of air, water, soil, marine, noise and thermal pollution and nuclear hazards Solid water management – causes, effects and control measures of urban and industrial waste Role of individual and institution in prevention of pollution Disaster management – floods, earthquake, cyclone, landslides

UNIT VI: Social Issues and the Environment:

Unsustainable to sustainable development; urban problems related to energy; Water conservation, rainwater harvesting, watershed management; problems and concerns of resettlement and rehabilitation of affected people. Environmental ethics - issues and possible solutions – Resource Consumption patterns and need for equitable utilization; Equity disparity in Western and Eastern countries; Urban and rural equity issues; need for Gender equity. Preserving resources for future generations The rights of animals; Ethical basis of environment education and awareness; Conservation ethics and traditional value systems of India Climate change, global warming, acid rain, Ozone layer depletion, Nuclear accidents and holocausts. Wasteland Reclamation; Consumerism and Waste products Environment legislations - The Environment (protection) Act ; The Water (prevention and control of pollution) Act ; The Wildlife Protection Act; Forest Conservation Act ; Issues involved in enforcement of environmental Legislations – environment impact assessment (EIA), Citizens actions and Action groups. Public awareness – using an environmental calendar of activities self Initiation

UNIT VII: Human Population and the Environment:

Global population growth, variation among nations Population Explosion; Family welfare programmes - methods of stetrilization; Urbanization Environment and human health – Climate and health, infectious Diseases, water –related diseases, risk due to chemical in food, cancer and environment. Human Rights – Equity, nutrition and health rights, intellectual property rights(IPRS), Community Biodiversity registration(CBRs).Value education – environment value, valuing nature, valuing culture, social justice, human heritage, equitable use of resources , common property resources , ecological degradation. HIV/AIDS; Women and child welfare; Information technology in environment and human health.

Text Books:

1. UGC publication “a text book of environment studies for undergraduate courses by Erach bharucha”, published by university Press (india) Pvt. Ltd., Hyderabad-500029.
2. Text Book of Environmental Studies, Second Edition by Deeksha Dave and S. S. Katewa, Cengage Learning

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BEIT307P COMPUTER LAB-I

(Practical Credit: 02)

Teaching Scheme:
Practical: 2 Hours/ week

Examination Scheme:
Practical: P (U): 25 Marks P (I): 25 Marks
Duration of University Exam. : 02 Hours

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G-01: Demonstration of computer hardware and Bios settings.
(North Bridge, South Bridge, PCI slots, ISA slots, AGP slot, memory bank slots, EIDE connector, Floppy connector, Chipset, Power connector, CPU slot, SMPS, Bios cell, Clock) (Ports-Serial, Parallel, PS/2, USB, Types of USB-A, B, Mini-A, Mini-B, Games, Ethernet/RJ42, Modem/RJ11, VGA, S-Video, HDMI, DVI- Mini & Micro DVI, IEEE 1394 Interface, SCSI, Minijack)

G-02: To demonstrate and study the various types I/O devices.
(Ex: Printers, Mouse, Scanner, monitor (CRT, LCD) etc.)

G-03: Execution of internal and external dos commands.
(Ex: Format, type, copy con, prompt, etc.)

G-04: Batch programming: Command Redirection and Pipelines, Variables and Control constructs.

G-05: Demonstration of system tools for windows operating systems.

G-06: Experiment based on system Registry of windows operating system.

G-07: Demonstration of complete booting process of windows operating system.

G-08: Demonstrate and study of networking accessories and Commands
(Hub, Switch, Bridge, Router, LAN Card, CAT cables, Coaxial cable, Fiber Optic cable, Repeater, Modem, Commands: ping, tracert etc.)

G-09: To demonstrate and study the troubleshooting of a computer system.
(Power supply problem, Boot failure Problem, Display problem, RAM problem, Motherboard Problem, CPU problem, CMOS battery problem etc.)

Note:

1. Practical sessions based on Any Six/Seven groups may be planned.

Reference Books:

1. PC Hardware: The complete Reference by Craig Zacker, 1st Edition, TMH publication.
2. Troubleshooting, Maintaining and Repairing PCs by Stephen Bigelow, 5th Edition, TMH publication.
3. PC Hardware: A Beginner's Guide by Ron Gilster, 1st edition, TMH publication.
4. Mastering Windows XP registry by Peter D Hipson. Sybex publication.
5. Windows ® Command-Line Administration: Instant Reference by John Paul Mueller, Sybex publication
6. Network + Training Guide by Drew Bird and Mike Harwood, Pearson Education

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SYLLABUS FOR

DISCRETE MATHEMATICS AND GRAPH THEORY

BE IV Semester (CS/CT/CE/IT)

Scheme (Theory: 4 hrs. & Tutorial:1 hr.)

UNIT-I: Mathematical Logic and Set Theory (08 Hrs)

Propositions and Logical Operations, Quantifiers, Conditional Statements and Tautologies, Methods of Proof, Principle of Mathematical Induction. Basic concepts of set theory, Operations on Sets, The power set.

UNIT-II: Relations and Functions(12 Hrs)

Relations: Ordered pairs and n-tuples, Product Sets and Partitions, Relations and Digraphs, Matrix of Relation, Paths in Relations and Digraphs, Properties of Relations, Equivalence Relations & Partitions, Compatible Relation, Manipulation of Relations, Composition of Relations, Transitive Closure of a relation, Partial order relation, Partially ordered set, Hasse Diagrams.
Functions: Definition, Composition of functions, Types of Functions, Invertible Function, Permutation Function, Characteristics function of a set with Theorems.

UNIT-III: Group Theory (12 Hrs)

Binary Operations, Properties, Semigroups,
Monoids,Subsemigroup,Submonoid, Isomorphism & Homomorphism, ,
Groups(only definitions and examples) Subgroups and Homomorphism, Cosets and Lagrange's Theorem, Normal subgroups.

Unit- IV:Rings, Lattices & Boolean Algebra(10 Hrs)

Rings, Fields, Integral Domain, Ring Homomorphism (definitions & examples), Lattices: Properties, Types of Lattices, Sub lattices, Isomorphic Lattices, Complemented & Modular Lattices (definitions & examples), Boolean Algebra: Definition, Properties, Simplification of Switching Circuits.

Unit-V: Graph Theory (12 Hrs)

Basic concepts of Graph Theory, Digraphs, Basic definitions, Paths and Circuits, Reachability and Connectedness, Matrix representation of graphs, Subgraphs & Quotient Graphs, Isomorphic digraphs & Transitive Closure digraph, Euler's Path & Circuit (only definitions and examples). Trees, Binary

Tree, Labeled Trees, Undirected Trees, Spanning Trees of Connected Relations, Prim's Algorithm to construct Spanning Trees, Weighted Graphs, Minimal Spanning Trees by Prim's Algorithm & Kruskal's Algorithm.

Unit-VI: Combinatorics(06Hrs)

Generating Functions, Recurrence Relations, Counting: Permutations & Combinations, Pigeonhole Principle with Simple Applications.

Text Books

1. Discrete Mathematical Structures(3rd Edition) by Kolman, Busby & Ross PHI.
2. Discrete Mathematical Structures with Applications to Computer Science byTremblay &Manohar, Tata McGraw- Hill.
3. Combinatorial Mathematics, C.L.Liu (McGraw Hill)

Reference Books

1. Discrete Maths for Computer Scientists & Mathematicians by Mott, Kandel, Baker.
2. Elements of Discrete Mathematics by C. L. Liu.
3. Discrete Mathematics by Lipschutz.
4. Discrete Mathematics by R.Johnsonbaugh.
5. Higher Engineering Mathematics by B.S. Grewal, 40th Edition, Khanna Publication

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BEIT402T **ALGORITHMS AND DATA STRUCTURES**
(Theory Credit: 05)

Teaching Scheme:	**Examination Scheme:**
Lecture: 4 Hours/week	**Theory: T (U): 80 Marks T (I): 20 Marks**
Tutorial: 1 Hour/week	**Duration of University Exam. : 03 Hours**

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UNIT I:
An Introduction to data structure: Introduction, Definition, Classification of data structure, Concept of data, Data types, Abstract data Types (ADT), Features of structured program. Introduction to algorithms: Definition and Characteristics of an Algorithm, Apriori analysis, Time and space complexity, Average , Best and Worst case complexities, Big 'O' Notations, Asymptotic notations, Top-Down and bottom-up programming techniques, Recursion, Divide and conquer strategy. (e.g. Quick sort, Tower of Hanoi).

UNIT II:
Stacks and Queue: Definition and Terminology, Concept of stack, Stack implementation, Operation on stack, Algorithms for push and pop, Implementing stack using pointers, Application of stacks, Evaluation of polish notation, multiple stack. Queue: Queue as ADT Implementation of queue, Operation on queue, Limitations, Circular queue, Double ended queue (dequeue), Priority queue, Application of queues, multiple queues.

UNIT III:
Linked List : Introduction, Linked list, Representation of linear linked list, Operation on linked list, Types of linked list, Singly linked list, Circular linked list, Doubly linked list, Circular doubly linked list, Application: Addition of Two polynomials, Generalized linked list, Sparse matrix.

UNIT IV:
Tree: Introduction to Non Linear Data Structures, Binary tree Concept and terminology, Representation of binary trees, Algorithm for tree traversals (recursive and non recursive). Conversion of general tree to binary tree (Implementation not expected). Binary search trees, Extended binary tree, Threaded binary tree. Height balanced and weight balanced binary trees, B-Tree, B^+ Tree, AVL tree, Multiway tree, 2-3 Tree.

UNIT V:
Graphs: Concepts and terminology, Representation of graphs using adjacency matrix, adjacency list, Depth First search and Breadth First Search Algorithms, Spanning trees, Minimal cost spanning tree and Shortest path algorithm (Single Source-all pairs).

UNIT VI:
Searching and sorting Techniques: Importance of searching. Sequential, Binary, Sorting : Bubble sort, selection sort, quick sort, Merge sort, heap sort, Shell sort, Analysis of these algorithms in worst and average cases. Hashing techniques and collision handing mechanism.

Text Books:

1. Data Structures with C by SEYMOUR LIPSCHUTZ [TMH].
2. Data Structure using C by ISRD Group [TMH].
3. Data Structure through C by G. S. BALUJA [Dhanpat Rai & co.].
4. Introduction to Data Structure in C by Ashok N. Kamthane [Pearson].
5. Data structures using C and C++ by Tenenbaum [Pearson].
6. Data structures Pseudocode with C by Gilberg/Foruzen, Cengage Learning

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BEIT402P **ALGORITHMS AND DATA STRUCTURES**
(Practical Credit: 01)

Teaching Scheme:	**Examination Scheme:**
Practical: 2 Hours/week	**Practical: P (U): 25 Marks P (I): 25 Marks**
	Duration of University Exam. : 02 Hours

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Note:

1. Practicals are based on ALGORITHMS AND DATA STRCUTURES syllabus (subject code: BEIT402T)
2. Practicals have to be performed using 'C' language
3. There should be at the most two practicals per unit
4. Minimum ten practicals have to be performed
5. Do not include study experiments

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BEIT403T **THEORY OF COMPUTATION**

(Theory Credit: 05)

Teaching Scheme:	**Examination Scheme:**
Lecture: 4 Hours/week	**Theory: T (U): 80 Marks T (I): 20 Marks**
Tutorial: 1 Hour/week	**Duration of University Exam. : 03 Hours**

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UNIT I:

Strings, Alphabet, Language operations, Finite state machine definitions, Finite automation model, Acceptance of strings and language, Non deterministic finite automation, Deterministic finite automation, Equivalence between NFA and DFA, Conversion of NFA into DFA, Minimization of FSM, Equivalence between two FSM's Moore and Mealy machines

UNIT II:

Regular sets, Regular expressions, Identity rules, Manipulation rules, Manipulation of regular expressions, Equivalence between RE and FA, Inter conversion, Pumping lemma, Closure properties of regular sets(proofs not required), Chomsky hierarchy of languages, Regular grammars, Right linear and left linear grammars, Equivalence between regular linear programming and FA, Inter conversion between RE and RG.

UNIT III:

Context free grammar, Derivation trees, Chomsky normal form, Greibach normal form, Push down automata, Definition, Model acceptance of CFL, Equivalence of CFL and PDA, Inter conversion, Closure properties of CFL(Proofs omitted),Pumping Lemma of CFL, Introduction of DCFL and DPDA

UNIT IV:

Turing Machine: Definition, Model of TM, Design of TM, Universal Turing Machine, Computable function, Recursive enumerable language, Types of TM's (proofs not required), Linear bounded automata and Context sensitive language, Counter machine

UNIT V:

Decidability and Undecidability of problems, Properties of recursive & recursively enumerable languages, Halting problems, Post correspondence problem, Ackerman function, and Church's hypothesis.

UNIT VI:

Recursive Function: Basic functions and operations on them, Bounded Minimalization, Primitive recursive function, μ-recursive function, Primitive recursive predicates, Mod and Div functions, Unbounded Minimalization, Equivalence of Turing Computable function and μ-recursive function.

Text Books:

1. Introduction to Automata Theory, Languages and Computation by J. E. Hopcraft,R. Motwani, J. D Ullman, second Edition, Pearson Education, Aisa
2. An Introduction to Formal Languages and Automata by Peter Linz

3. Introduction to Langauges and the theory of Automata by John Martin, Third Edition(TMH)

Reference Books:

1. Theory of Computer Science, Automata, Languages and Computation by K. L. P. Mishra and N. Chandrasekaran, Third Edition, PHI Learning.
2. Elements of Theory of Computation by Lewis H.P and Papadimition C.H.

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BEIT404T COMPUTER ARCHITECTURE AND ORGANIZATION

(Theory Credit: 05)

Teaching Scheme:	**Examination Scheme:**
Lecture: 4 Hours/week	**Theory: T (U): 80 Marks T (I): 20 Marks**
Tutorial: 1 Hour/week	**Duration of University Exam. : 03 Hours**

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UNIT I:

Basic Structure of Computers:

Functional Units, Basic Operational Concepts, Bus Structures, Software, Multiprocessors and Multicomputers.

Machine Instructions:

Memory Locations and Addresses, Memory Operations, Machine program sequencing, addressing modes and encoding of information, Assembly Language ,Stacks, Queues and Subroutine.

UNIT II:

Instruction Sets:

Instruction Format, limitations of Short word- length machines, High level language Considerations, Motorola 68000 architecture.

Processing Unit:

Some fundamental concepts, Execution of a complete instruction, Single, two, three bus organization, Sequencing of control Signals.

UNIT III:

Micro-programmed Control:

Microinstructions, grouping of control signals, Micro program sequencing, Micro Instructions with next Address field, Perfecting microinstruction, Emulation, Bit Slices, Introduction to Microprogramming, Macro Processor.

UNIT IV:

Arithmetic: Number Representation, Addition of Positive numbers, Logic Design for fast adders, Addition and Subtraction, Arithmetic and Branching conditions, Multiplications of positive numbers, Signed Operand multiplication, fast Multiplication, Booth's Algorithm, Integer Division, Floating point numbers and operations.

UNIT V:

The Memory System:

Some Basic Concepts, Semiconductor RAM Memories, Memory system considerations, Semiconductor ROM Memories, Memory interleaving, Cache Memory, Mapping techniques, Virtual memory, Memory Management requirements.

UNIT VI:

Computer Peripherals:

I/O Devices, DMA, Interrupt handling, online storage, File services.

Processors:

Families of microprocessors Chips, Introduction to RISC & CISC Processors, Introduction to Pipelining.

Text Books:

1. Computer Organization 4 th Edition, 2001 V. Carl Hamacher Mc GrawHill.
2. Computer Organization and Design (The Hardware/Software Interfaces) 4th Edition David A. Patterson & John L. Hennessy Morgan Kaufmann.

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BEIT405T **OBJECT ORIENTED METHODOLOGY**
(Theory Credit: 05)

Teaching Scheme:	**Examination Scheme:**
Lecture: 4 Hours/week	**Theory: T (U): 80 Marks T (I): 20 Marks**
Tutorial: 1 Hour/week	**Duration of University Exam. : 03 Hours**

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UNIT I:
Introduction object-oriented development,Object Oriented Methodology, three Models, object oriented terms, object modeling Technique, object and classes links and associations, generalization and inheritance, grouping constructs a sample object module. Advanced object modeling; aggregation abstract classes, multiple, inheritance, metadata, candidate keys.

UNIT II:
Dynamic modeling, events and states, nested state diagrams, concurrency, advanced dynamic modeling concepts, functional models, data flow diagram, constraints, a sample functional module

UNIT III:
Design methodology overview of analysis, problem statement, ATM network, object modeling, various phases, dynamic modeling, various phases

UNIT IV:
System design, overview, sub systems, allocating subsystems, management of data stores, choosing software control, implementation, handling boundary condition

UNIT V:
Object design, overview, designing algorithms, design optimization, optimization of control, adjustment of inheritance, design of associations, object representation, physical packaging,

UNIT VI:
Implementation, programming languages, database systems, object oriented style, reusability, extensibility, robustness.

Text Books:

1. Object Oriented Modeling and Design by James Rumbaugh, Michal Blaba, William Premerlani, Frederic Eddy, William Lorerson, PHI, 1997
2. Object –oriented Programing Using C++ and Java by Ramesh Vasappanavar, Anand Vasappanavar , Gautam Vasappanavar, PEARSON, 2011

Reference Books:

1. Mastering C++ by A.R.Venugopal, Rajkumar, T. Ravishanker ,TMH, 1997.
2. Computer Science A Structured Approach Using C++ by Behrouz A. Forouzan , Richard F. Gilberg, Second Edition, CENGAGE Learning.

3. Object Oriented Programming with C++ by E Balagurusamy, Fifth Edition, TMH.

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BEIT405P **OBJECT ORIENTED METHODOLOGY**
(Practical Credit: 01)

Teaching Scheme:
Practical: 2 Hours/week

Examination Scheme:
Practical: P (U): 25 Marks P (I): 25 Marks
Duration of University Exam. : 02 Hours

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Note:

1. Practicals are based on OBJECT ORIENTED METHODOLOGY syllabus (subject code: BEIT405T)
2. Practicals have to be performed using 'C++' language
3. There should be at the most two practicals per unit
4. Minimum ten practicals have to be performed
5. Do not include study experiments

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BEIT406P **COMPUTER LAB-II**
(Practical Credit: 02)

Teaching Scheme:
Practical: 2 Hours/week

Examination Scheme:
Practical: P (U): 25 Marks P (I): 25 Marks
Duration of University Exam. : 02 Hours

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G-01. Experiment based on MS Office macro programming.

G-02. Installation of OS and Configuring a Desktop for– the Windows Operating System (XP and 7) and the Linux Operating System (Ubuntu/Fedora/Mint).

G-03. Introduction to UNIX Operating System, The UNIX architecture and Command Usage, The File System, PIPES, Filters using Regular Expressions.

G-04. Introduction to Linux Operating System, flavors of Linux vi Editor, vim Editor

G-05. The Shell - Shell Variables; Scripts; Meta Characters and Environment; if and case Statements; for, while and until loops; Essential Shell Programming.

G-06. AWK (The Pattern-Action Language) - BEGIN and END Patterns; Variables, Records and Fields; Loops; Handling Text; String Manipulations.

G-07. Introduction to MATLAB Simulator and Programming based on MATLAB Simulator.

Note:

1. Practical sessions based on Any Four/Five groups from G-01 to G-06 may be planned.
2. Practical Group G-07 is compulsory.

Reference Books:

1. Sumitabha Das, "UNIX – Concepts and Applications", Fourth Edition, Tata McGraw Hill, 2006.
2. Behrouz A. Forouzan and Richard F. Goldberg, "UNIX and Shell Programming", Thomson Publishing, 2005.
3. Guide to Unix and Linux by Harley Hahn's 1st edition, TMH publication, 2011.
4. Microsoft Office Programming: A Guide for Experienced Developers by Rod Stephens, Apress,2003
5. Dale Dougherty and Arnold Robbins, "sed and awk", Second Edition, O'Reilly Media, 1997
6. "A concise Introduction to MATLAB", by William J. Palm III, First Edition, Tata McGraw Hill.
7. "MATLAB and Simulink for Engineers" by Agam Kumar Tyagi, Oxford University Press.

8. “MATLAB for Engineers”, by Holly Moore, Prentice Hall, Third Edition
9. www.mathworks.in

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