COURSE STRUCTURE
AND
DETAILED SYLLABUS

II, III & IV – B.TECH – I & II - SEMESTERS

INFORMATION TECHNOLOGY

FOR
B.TECH FOUR YEAR DEGREE COURSE
(Applicable for the batches admitted from 2015-16)

ANURAG GROUP OF INSTITUTIONS
AUTONOMOUS
VENKATAPUR, GHATKESAR, HYDERABAD – 500 088, TELANGANA STATE

ANURAG GROUP OF INSTITUTIONS
AUTONOMOUS

II YEAR I SEMESTER **COURSE STRUCTURE**

Subject Code	Category	Subject Name	Lectures	T/P/D	Credits
A53024	BS	Probability & Statistics	4	0	4
A53025	BS	Discrete Mathematics	4	0	4
A53026	PC	Data Structures	3	0	3
A53010	ES	Electronic Devices and Circuits	3	0	3
A53027	ES	Digital Logic Design	3	1	3
A53028	PC	Object Oriented Programming	3	0	3
A53007	MC	Gender Sensitization	2	0	0
A53213	ES	Electronic Devices and Electrical Circuits Lab	0	3	2
A53214	PC	Data Structures Lab	0	3	2
Total			**22**	**07**	**24**

II YEAR II SEMESTER **COURSE STRUCTURE**

Subject Code	Category	Subject Name	Lectures	T/P/D	Credits
A54006	BS	Environmental Studies	3	0	3
A54024	PC	Design and Analysis of Algorithms	3	1	3
A54025	PC	Computer Organization	3	1	3
A54026	PC	Database Management Systems	3	0	3
A54027	PC	Software Engineering	3	0	3
A54028	PC	Java Programming	3	0	3
A54029	MC	Logical Reasoning and Quantitative Aptitude-I	2	0	0
A54217	PC	Java Programming Lab	0	3	2
A54218	PC	Database Management Systems lab	0	3	2
A54219	HS	Soft Skills and Personality Development	0	3	2
Total			**20**	**11**	**24**

III YEAR I SEMESTER **COURSE STRUCTURE**

Subject Code	Category	Subject Name	Lectures	T/P/D	Credits
A55040	PC	Formal Languages and Automata Theory	3	1	3
A55041	PC	Web Technologies	3	0	3
A55048	PC	Computer Networks	4	0	4
A55042	PC	Operating Systems	4	0	4
A55043 A55061 A55044 A55046 A55047	PE - I	1.Object Oriented Analysis and Design 2.Information Retrieval Systems 3. Human Computer Interaction 4.Mobile Computing 5. Principles of Programming Languages	4	0	4
A55049	MC	Logical Reasoning and Quantitative Aptitude – II	2	0	0
A55216	HS	Advance English Communication Skills Lab	0	3	2
A55217	PC	Web Technologies Lab	0	3	2
A55218	PC	OS and Computer Networks Lab	0	3	2
Total			**20**	**10**	**24**

III YEAR II SEMESTER **COURSE STRUCTURE**

Subject Code	Category	Subject Name	Lectures	T/P/D	Credits
A56043	PC	Compiler Design	3	1	3
A56044	PC	Data Warehousing and Data Mining	3	0	3
A56067	PC	Information Security	3	0	3
A56046	PC	Advanced Computer Networks	3	0	3
A56047 A56048 A56068 A56069	PE-II	1. Machine Learning 2. Internet of Things 3. Soft Computing 4. Software Project Management	3	0	3
A56051 A56052 A56053	PE-III	1. Unix Programming 2. Computer Graphics 3. Software Testing	3	0	3
A56054	MC	NSS/NSO	2	0	0
A56217 A56218 A56219	PE-III	1. Unix Programming Lab 2. Computer Graphics Lab 3. Software Testing Lab	0	3	2
A56220	PC	Data Warehousing and Data Mining Lab	0	3	2
A56221	HS	Personality Development and Career Building	0	3	2
Total			**20**	**10**	**24**

IV YEAR I SEMESTER **COURSE STRUCTURE**

Subject Code	Category	Subject Name	Lectures	T/P/D	Credits
A57067	PC	Mobile Application Development	4	1	4
A57068	PC	Cloud Computing	4	0	4
A57050 A57051 A57052	PE–IV	1. Predictive Analytics with R programming 2. Scripting Languages 3. Image Processing with SCI Lab	3	1	3
A57053 A57054 A57069 A57070	PE-V	1. Big Data Analytics 2. Distributed Systems 3. Semantic Web and Social Networks 4. Advanced Databases	4	1	4
A57057 A57038 A57010	OE–I	1. Management Science 2. Entrepreneurship Development 3. Managerial Economics and Financial Analysis	3	0	3
A57221 A57222 A57223	PE-IV	1.Predictive Analytics with R programming Lab 2.Scripting Languages Lab 3.Image Processing with SCI Lab	0	3	2
A57224	PC	Mobile Application Development Lab	0	3	2
A57225	PW	Industrial Oriented Mini Project	0	3	2
Total			**18**	**12**	**24**

IV YEAR II SEMESTER **COURSE STRUCTURE**

Subject Code	Category	Subject Name	Lectures	T/P/D	Credits
A58021 A58009 A58023 A58012	OE-II	1. Fundamental of Budget 2. Project Management 3. Essential English & Employability Skills 4. Business English	3	1	3
A58024 A58025 A58026	OE-III	1.Negotiation Skills 2.Project Management 3.Value Engineering	3	0	3
A58219	PW	Seminar	0	6	3
A58220	PW	Comprehensive Viva Voce	0	0	3
A58221	PW	Project	0	15	12
Total			**6**	**22**	**24**

T- Theory P-Practical D-Drawing

ANURAG GROUP OF INSTITUTIONS
(AUTONOMOUS)

II Year B.Tech. IT - I Sem	L	T / P / D	C
	4	0	4

(A53024) PROBABILITY AND STATISTICS

Prerequisites: Mathematics- I and II

Course Objectives:

1. Understand Chance causes and random variable that describes randomness or an uncertainty in certain realistic situation. It can be of either discrete or continuous type.

2. In the discrete case, study of the binomial and the Poisson random variables and the Normal random variable for the continuous case predominantly describe important probability distributions. Important statistical properties for these random variables provide very good insight and are essential for industrial applications.
3. The types of sampling, Sampling distribution of means ,Sampling distribution of variance, Estimations of statistical parameters, Testing of hypothesis of few unknown statistical parameters.
4. Understanding the Experiment and the design of experiment.
5. The random processes, The classification of random processes, Markov chain, Classification of states
6. Stochastic matrix (transition probability matrix),Limiting probabilities, Applications of Markov chains

Course Outcomes:

1. Identify distribution in certain realistic situation. It is mainly useful for circuit as well as non-circuit branches of engineering. Also able to differentiate among many random variables involved in the probability models. It is quite useful for all branches of engineering.
2. Calculate mean and proportions (small and large sample) and to make important decisions from few samples which are taken out of unmanageably huge populations. It is mainly useful for non-circuit branches of engineering.
3. Design their experiment with the basic norms and test their design efficiency. It is useful to all the branches of engineering.
4. Understand about the random process, Markov process and Markov chains which are essentially models of many time dependent processes such as signals in communications, time series analysis, queuing systems. The student would be able to find the limiting probabilities and the probabilities in nth state. It is quite useful for all branches of engineering.
5. This course will help the IT students later in understanding the basics of various statistical and machine learning tools.

Unit I:

Probability: Sample space and events, Classical and Statistical definition of Probability, The axioms of probability, Some Elementary theorems of Probability, Conditional probability, Baye's theorem. Random variables, Discrete and continuous random variable,

Unit II:

Definitions of Probability Distribution function, Probability mass function, Probability density function and properties. Definitions of Mathematical expectation, Moments (about origin & Centre), Definition of moment generating function for discrete and continuous random variable.

Discrete Distributions: Binomial and Poisson distributions (definition and problems) their mean, variance and moment generating function.

Continuous Distribution: Normal and exponential distributions (definition and problems) related properties.

Concepts of Joint Distribution function of more than one random variable, Definition of joint, marginal and conditional distribution (for two variables only).

Unit III:

Sampling distribution: Populations and samples - Sampling distributions of mean (σ known and unknown)

Estimation: Concept of Point estimation and its properties (definition only), Concept of interval estimation with examples.

Test of Hypothesis: Null & Alternative Hypothesis, Critical region, Type I and Type II errors, level of significance, one tail, two-tail tests.

Large sample test: concerning means – proportions (One and Two samples).

Unit IV:

Small sample test: Chi-Square test, Student's t-test (Single mean, Difference of mean and Paired samples) and F-test.

Design of Experiment: Introduction to ANOVA (one – way, two – way), Principles of Design of Experiment, completely randomized design (CRD), randomized complete block design (RBD), Latin Square Design (LSD).(No Derivations only concept, definitions and problems)

Unit V:

Stochastic Process: Introduction to stochastic Process, Classification of Random Processes, Stationary and non-stationary random process, Stochastic Matrix.

Markov Chain: Classification of States, Classification of chains, Random Walk and Gambler Ruin.

Text Books:

1. Sheldon M. Ross ,Probability and Statistics for Engineers and Scientists, Academic Press.
2. Richard A Johnson ,Probability and Statistics for Engineers , Pearson Education.
3. Charles M Grinstead, J Laurie Snell ,Introduction to Probability, American Mathematical Society.

Reference Books:

1. A.V. Skorokhod, Basic Principles and Applications of Probability Theory, Springer.
2. Arnold O. Allen, Probability & Statistics, Academic Press.
3. Hwei P. Hsu, Theory and Problems of Probability, Random Variables, and RandomProcesses, Schaum's Outline Series, McGraw- Hill.
4. Mendan Hall, Probability & Statistics, Beaver Thomson Publishers.
5. Miller and John E. Freund, Probability & Statistics for Engineers, Prentice Hall of India.
6. Montgomery, Design and Analysis of Experiments, Wiley.
7. T.T. Soong, Fundamentals of Probability and Statistics for Engineers, JohnWiley& Sons, Ltd.
8. Zivorad R. Lazic, Design of Experiments in Chemical Engineering, Wiley-VCH.

ANURAG GROUP OF INSTITUTIONS
(AUTONOMOUS)

II Year B.Tech. IT - I Sem	L	T / P / D	C
	4	0	4

(A53025) DISCRETE MATHEMATICS

Prerequisites: Mathematics- I and II

Course Objectives:

1. Define the syntax and semantics of propositional and predicate logic.
2. Translate statements from a natural language into its symbolic structures in logic.
3. Prove elementary properties of modular arithmetic and explain their applications in Computer Science, for example, in cryptography and hashing algorithms.
4. Apply the notion of relations on some finite structures, like strings and databases.
5. Analyze algorithms using the concept of functions and function complexity.
6. Apply graph theory models of data structures and state machines to solve problems of connectivity and constraint satisfaction, for example, scheduling.

Course Outcomes:

1. To evaluate elementary mathematical arguments and identify fallacious *reasoning* (not just fallacious conclusions).
2. Solve discrete mathematics problems that involve: computing permutations and combinations of a set.
3. Analyze and deduce problems involving recurrence relations and generating functions.
4. Perform operations on discrete structures such as sets, functions, relations, and sequences.
5. Apply graph theory models of data structures and state machines to solve problems of connectivity and constraint satisfaction, for example, scheduling.

Unit I:

Foundations: Basics, Sets, Fundamentals of Logic, Logical Inferences, First order logic and Other methods of Proof, Rules of Inference for Quantified Propositions.

Unit II:

Elementary Combinatorics: Basics of Counting, Combinations and Permutations, Enumerating Combinations and Permutations with &without repetitions, Constrained repetitions.

Unit III:

Recurrence Relations: Generating Functions, Calculating coefficient of Generating Function, Solving Recurrence relations by substitution method and Generating Functions, The Method of Characteristic Roots, Solutions to inhomogeneous recurrence relations.

Unit IV:

Relations and Digraphs: Relations and Directed Graphs, Special Properties of Binary Relations, Equivalence Relations, Ordering Relations, Lattice, Paths and Closures, Directed Graphs and adjacency matrices, Topological Sorting.

Unit V:

Graphs - Basic Concepts, Isomorphism and Sub-graphs, Trees and Their Properties, Spanning Trees, Binary Trees, Planar Graphs, Euler's Formula, Multi-graphs and Euler Circuits, Hamiltonian Graphs, Chromatic Numbers, The Four-Color Problem.

Text Book:

1. Joe L. Mott, Abraham Kandel, TheodareP.Baker ,Discrete Mathematics for Computer Scientists and Mathematicians, Second Edition, PHI, 2009.

Reference Books:

1.Kenneth H Rosen, Discrete Mathematics and its Applications, Sixth Edition, Tata McGraw Hill Publishing Company Limited, New Delhi, 2007.

2. Tremblay J P and Manohar R, Discrete Mathematical Structures with Applications to Computer Science, Tata McGraw Hill Publishing Company Limited, New Delhi, 2007.

ANURAG GROUP OF INSTITUTIONS
(AUTONOMOUS)

II Year B.Tech. IT - I Sem	L	T / P / D	C
	3	0	3

(A53026) DATA STRUCTURES

Prerequisites: Any programming language

Course Objectives:

1. Understand various static and dynamic representations of data structures.
2. Understand fundamental algorithmic problems of various nonlinear data structures.
3. To be familiar with Graph representations and traversals.
4. Know the basic concepts of Hashing.

Course Outcomes:

1. Analyze the representation of various static, dynamic and, hierarchical data structures.
2. Design and implement the mechanism of stacks, general tree data structures with their applications.
3. Implement various algorithms on graph data structures, including finding the minimum spanning tree , shortest path with real time applications, etc.,
4. Implementation of various advance concepts of binary trees and graphs with real time applications.
5. Outline the concepts of hashing, collision and its resolution methods using hash function

Unit I :

Introduction: What is data structure, Types of data structures, Static and Dynamic representation of data structure and comparison. **Strings:**String definition, String built-in functions (strlen(),strcpy(),strcat(),strcmp(),strrev()), Strings and Pointers (Ch-3,T3) **Stacks:** Stacks definition, operations on stacks, Representation and evaluation of expressions using Infix, Prefix and Postfix, Algorithms for conversions and evaluations of expressions from infix to prefix and postfix using stack.

Unit II :

Trees: Basic terminology, Types of trees: Binary Tree: terminology, Complete and Full Binary Tree, Extended Binary Trees, Threaded Binary trees and In order Threading. Representation of Trees using Arrays and Linked lists (advantages and disadvantages). Tree Traversal and Representation of Algebraic expressions; Algorithms for Tree Traversals.

Unit III :

Advanced concepts on trees: Representation and creation of binary Search Trees (BST), Algorithm for Inserting, deleting and searching in BST. Representation and advantages of AVL Trees, algorithms on AVL Trees: Insertion, Rotation and Deletion. Definition and advantages of B-trees, B + Trees, Red-Black Trees, M-way trees with examples.

Unit IV:

Graphs-Basic terminology, Representation of graphs: sequential representation (Adjacency, Path Matrix) Linked representation.

Graph Traversals-Breadth First Search, Depth First Search with algorithms. Definition and properties of spanning tree, Minimum Spanning Tree, Dijkstra Algorithms.

Unit V :

Hashing: General Idea, Hash Functions, Separate Chaining ,Open Addressing-Linear probing, Quadratic Probing, Double Hashing, Rehashing, Extensible Hashing, Collisions in Hashing, Implementation of Dictionaries

Text Books:

1. Seymour Lipschutz, Schaum's Outlines ,Data Structures, Special Second Edition,Tata McGraw-Hill,.
2. Richard F.Gillberg&Behrouz A. Forouzan, Data Structures, A Pseudo code Approach with C, Second Edition, Cengage Learning, India Edition, 2005.

Reference Books:

1. Aaron M. Tenenbaum,Yedidyah Langsam and Moshe J. Augenstein, Data Structures Using C and C++, PHI Learning Private Limited, Delhi India.
2. Horowitz and Sahani, Fundamentals of Data Structures, Galgotia Publications Pvt Ltd Delhi India.
3. A.K. Sharma , Data Structure Using C, Pearson Education India.

ANURAG GROUP OF INSTITUTIONS
(AUTONOMOUS)

II Year B.Tech. IT - I Sem	L	T / P / D	C
	3	0	3

(A53010) ELECTRONIC DEVICES AND CIRCUITS

Prerequisites: Basic-electrical engineering

Course Objectives:

1. To explain the operation of PN diode etc and how to design regulated power supply.
2. To provide an overview of the principles, operation and application of the analog devices like BJT,FET etc
3. To understand various biasing techniques to stabilize transistor operating point
4. To explain the operation, design and analysis of small signal amplifiers using BJT & FET.
5. To analyze different feedback techniques and the design of oscillators for getting sustained oscillations.

Course Outcomes:

1. Understand characteristics of semiconductor devices, diodes, bi polar junction transistors.
2. Introduce to the revolutionary Field Effect Transistors that lead to the development of integrated circuits and study their construction and characteristics.
3. Design simple basic electronic circuits like rectifiers, voltage regulators, amplifiers & oscillators using both BJTs and FETs.
4. Practically design and realize rectifier and amplifier circuits in the lab. Introduction to linked course.

Unit I :

P-N JUNCTION DIODE AND RECTIFIERS:

Quantative theory of P-N Junction, P-N Junction as Diode, Diode Equation, Volt-Ampere Characteristics, Temperature Dependence of VI Characteristic, Transition and Diffusion Capacitances, Diode Equivalent Circuits, Breakdown Mechanisms in Semi Conductor Diodes, Zener Diode Characteristics, Principle of Operation and Characteristics of Tunnel Diode, Schottky Barrier Diode.

The P-N Junction as a Rectifier, Half wave Rectifier, Full wave Rectifier, Bridge Rectifier, Harmonic Components in a Rectifier Circuit, Inductor Filters, Capacitor Filters, L-Section Filters, ΠΠ-Section Filters, Comparison of Filters, Voltage Regulation Using Zener Diode, SCR.

Unit II :

BIPOLAR JUNCTION TRANSISTOR AND FIELD EFFECT TRANSISTOR:

The Junction Transistor, Transistor Current Components, Transistor Construction, BJT Operation, BJT Symbol, Transistor as an Amplifier, Common Base, Common Emitter and Common Collector Configurations, Limits of Operation, BJT Specifications.

The Junction Field Effect Transistor (Construction, Principle of Operation, Symbol), Pinch – Off Voltage –Volt –Ampere Characteristics, The JFET Small Signal Model, MOSFET (Construction, Principle of Operation, Symbol) MOSFET Characteristics In Enhancement and Depletion Modes.

Unit III :

TRANSISTOR BIASING AND STABILIZATION:

Operating Point, The DC and AC Load Lines, Need For Biasing, Fixed Bias, Collector Feedback Bias, Emitter Feedback Bias, Collector Emitter Feedback Bias, Voltage Divider Bias, Bias Stability, Stabilization Factors, Stabilization Against Variation In V_{BE} and β, Bias Compensation Using Diodes and Transistors. Thermal Runway, Thermal Stability, Biasing FET.

Unit IV:

BJT AND FET AMPLIFIERS:

BJT Hybrid Model, Determination of h-Parameters From Transistor Characteristics, Analysis of A Transistor Amplifier Circuit Using h-Parameters, Comparison of CB, CE And CC Amplifier Configurations.FET Common Source Amplifier, Common Drain Amplifier, Generalized FET Amplifier, FET, As Voltage Variable Resistor, Comparison of BJT And FET, The Uni Junction Transistor .

Unit V:

FEED BACK AMPLIFIERS AND OSCILLATORS:

Concepts of feedback. Claffication of feedback amplifiers, General characteristics of negative feedback amplifiers, Effect of Feedback on Amplifier characteristics, Simple problems.

OSCILLATORS: Condition for oscillations. RC and LC type oscillators, Crystal oscillators, Frequency and amplitude stability of oscillators, Generalized analysis of LC oscillators, Quartz (Hartley, Colpitts), RC-phase shift and Wien-bridge oscillators.

Text Books:

1. Millman's Electronic Devices and Circuits – J. Millman, C.C.Halkias, and Satyabrata Jit Tata McGraw Hill, 2nd Ed., 2007.
2. Electronic Devices and Circuits – R.L. Boylestad and Louis Nashelsky, Pearson/Prentice Hall,9th Edition,2006.
3. Introduction to Electronic Devices and Circuits- Rober T. Paynter PE.
4. Electronics Devices and Circuits – A. P. Godse Technical Publications.

Reference Books:

1. Electronic Devices and Circuits – T.F. Bogart Jr., J.S.Beasley and G.Rico, Pearson Education, 6th edition, 2004.
2. Principles of Electronic Circuits – S.G.Burns and P.R.Bond, Galgotia Publications, 2nd Edn.., 1998.
3. Microelectronics – Millman and Grabel, Tata McGraw Hill, 1988.
4. Electronic Devices and Circuits – Dr. K. Lal Kishore, B.S.

ANURAG GROUP OF INSTITUTIONS
(AUTONOMOUS)

II Year B.Tech. IT - I Sem	L	T / P / D	C
	3	1	3

(A53027) DIGITAL LOGIC DESIGN

Prerequisites: Basic electrical engineering

Course Objectives:

1. Understand the concepts of Binary system and conversions.
2. Be familiar with the concepts of logical functions using Boolean algebra
3. Learn various combinational circuits.
4. Understand the functionality of flip flops and design of sequential circuits.
5. Know the concepts of basic memory system.

Course Outcomes:

1. Understand various number systems, conversions, range and error detecting and correcting codes and their significance.
2. Evaluate the minimization of logic gates using Boolean algebraic principles and k-maps.
3. Design various simple and complex combinational circuits with real time applications.
4. Analyze the basic principles behind Flip flops and the design of sequential circuits with real time applications.
5. Illustrate various types of memory devices and their design.

Unit I:

Number Systems: Binary, Octal, Hex Decimal, and Conversions, range; Binary additions and subtractions (using 1c, and 2c), concept of overflow; representations of negative numbers using 1's and 2's complement and range; **BCD numbers:** Representation of 8421, 2421, Ex-3, Gray and self complementary codes; additions and subtractions on 8421 codes; **Error detecting codes:** even, odd parity, hamming codes; **Error correcting codes:** hamming codes, block parity codes; Floating point representation.

Unit II:

Boolean Algebra and Digital Logic GATES, Basic Boolean laws and properties; Boolean functions; canonical and standard forms (SOP, POS); Gate minimization using three and four variable K-Map's with and without don't cares. Encoders, Decoders, Multiplexers, D-Multiplexers;

Unit III:

Definition of combinational circuits**,** design procedure for half, full, decimal (8421) adders and subtractors; Combinational Circuit Design for BCD code converters;

Unit IV :

Sequential circuits, latches, Flip Flops; Analysis of clocked sequential circuits, State Reduction and Assignment, Register, Ripple Counters, Synchronous Counters, Other Counters.

Unit V :

Types of Memory – Main memory – random access memory, ROM, Types of ROM; Decoder and RAM interface: Address lines, data lines, chip select signal; Design of large memories using small memories, using decoders; problems in memory design; Cache Memory- design issues, hit and miss ratio related problems; Associative and Auxiliary memory;

Text Books:

1. M. Morris Mano, Digital Design, Third Edition, Pearson Education/PHI, 2001.

2. Roth, Fundamentals of Logic Design, Fifth Edition, Thomson, 2004

Reference Books:

1. John F. Wakerly, Digital Design, Principles and Practices, 4th Edition, Pearson / Prentice Hall, 2005.
2. Malvino& Leach, Digital Principles and Applications, Seventh Edition, Tata McGraw-Hill Education, 2010.
3. A.K. Maini, Digital Electronics, Principles and Integrated Circuits, 1st Edition, Wiley India Publications, 2007.
4. M. Morris Mano and Michael D. Ciletti, Digital Design, 5th Edition, Pearson Education, 2012.

ANURAG GROUP OF INSTITUTIONS
(AUTONOMOUS)

II Year B.Tech. IT - I Sem	L	T / P / D	C
	3	0	3

(A53028) OBJECT ORIENTED PROGRAMMING

Prerequisites: Any programming language

Course Objectives:

1. Understand the C++ program structure and also the basics of C++ Programming language.
2. Use input and output formatted stream classes and the file streams and file modes to access the files.
3. Know the template classes and functions and Runtime error and how to handle that errors.

Course Outcomes:

1. Describe the important concepts of object oriented programming like object and class, Encapsulation, inheritance and polymorphism
2. Develop the applications using object oriented programming with C++.
3. Implement the concept of inheritance and polymorphism.
4. Apply I/O streams and files to develop programs for real time problems.
5. Apply advance features like templates and exception handling to make programs supporting reusability and sophistication

Unit I :

Concepts of OOP: Introduction to OOP, Procedural versus Object Oriented Programming, Principles, Benefits and applications of OOP.

C++ Basics: Overview, Program structure, namespace, identifiers, variables, constants, enumerations, operators, typecasting, control structures.

Unit II :

C++ Functions: Simple functions Call and Return by reference, Inline functions, Overloading of functions, default arguments, friend functions, and virtual functions.

Objects and classes: Basics of object and class in C++, Private and public members, static data and function members, constructors and their types, destructors, operator overloading.

Unit III :

Inheritance: Concept of Inheritance, types of inheritance: single, multiple, multilevel, hierarchical, hybrid, protected members, overriding, virtual base class.

Polymorphism: Pointers in C++, Pointers and Objects, this pointer, virtual and pure virtual functions, implementing polymorphism.

Unit IV:

I/O Streams: Concept of streams, cin and cout objects, C++ stream classes, Unformatted and formatted I/O, manipulators.

File management: File stream, C++ File stream classes, File management functions, File modes, sequential and random access files.

Unit V:

Templates: Function and class templates, overloading of template functions.

Exceptions: Basics of exception handling, exception handling mechanisms, throwing, catching mechanisms, rethrowing an exception.

Text Books:

1. Herbert Schlitz ,The Complete Reference C++,Fourth Edition, TATA McGraw Hill, 2003.
2. SauravSahay, Object Oriented Programming in C++, Second Edition, Oxford University Press, 2012.

Reference Books:

1. E Balagurusamy, Object Oriented Programming with C++, , Sixth Edition, TATA McGraw Hill, 2013.
2. Steven Holzner,C++ Programming, Black Book, Dreamtech
3. Robert Lafore , Object Oriented Programming in Turbo C++,, Galgotia
4. Ashok Kamthane, Object Oriented Programming with ANSI and Turbo C++, Pearson

ANURAG GROUP OF INSTITUTIONS
(AUTONOMOUS)

II Year B.Tech. IT - I Sem	L	T / P / D	C
	2	0	0

(A53007) GENDER SENSITIZATION

Course Objectives:

1. To develop students sensibility with regard to issues of gender in contemporary India.
2. To provide a critical perspective on the socialization of men and women.
3. To introduce students to information about some key biological aspects of genders.
4. To expose the students to debates on the politics and economics of work.
5. To help students reflect critically on gender violence.
6. To expose students to more egalitarian interactions between men and women.

Course Outcomes:

1. Students will have developed a better understanding of important issues related to gender in contemporary India.
2. Student will be sensitized to basic dimensions of the biological, sociological, psychological and legal aspects of gender. This will be achieved through discussion of materials derived from research, facts, everyday life, literature and film.
3. Students will attain a finer grasp of how gender discrimination works in our society and how to counter it.
4. Students will acquire insight into the gendered division of labour and its relation to politics and economics.
5. Men and women students and professionals will be better equipped to work and live together as equals.
6. Students will develop a sense of appreciation of women in all walks of life.
7. Through providing accounts of studies and movements as will as the new laws that provide protection and relief to women, the textbook will empower students to understand and respond to gender violence.

Unit-I:

UNDERSTANDING GENDER:

Gender: Why Should We Study It? (Towards a World of Equals: Unit-1)
Socialization: Making Women Making Men (Towards a World of Equals: Unit-2)
Introduction. Preparing for Womanhood. Growing up Male. First lesions in Caste. Different Masculinities. Just Relationships: Being Together as Equals (Towards a World of Equals: Unit-12)Mary Kom and Onler. Love and Acid just do not Mix. Love Letters. Others and Fathers. Further Reading: Rosa Parks-The Brave Heart.

Unit-II:

GENDER AND BIOLOGY:

Missing Women: Sex Selection and Its Consequences (Towards a World of Equals: Unit-4) Declining Sex Ratio. Demographic Consequences.Gender Spectrum: Beyond the Binary (Towards a World of Equals: Unit-10)Two or Many? Struggles with

Discrimination.Additional Reading: Our Bodies, Our Health (Towards a World of Equals: Unit-13)

Unit-III:

GENDER AND LABOUR:

Housework: the Invisible Labour (Towards a World of Equals: Unit-3)"My Mother doesn't Work." "Share the Load."Women's Work: Its Politics and Economics (Towards a World of Equals; Unit-7)Fact and Fiction. Unrecognized and Unaccounted work. Further Reading: Wages and Conditions of Work.

Unit-IV:

ISSUES OF VIOLENCE:

Sexual Harassment: Say No! (Towards a World of Equals: Unit-6) Sexual Harassment not Eve-Teasing- Coping with Everyday Harassment-Further Reading: "Chupulu". Domestic Violence: Speaking Out (Towards a World of Equals: Unit-8)Is Home a Safe Place? – When Women Unite (Film). Rebuilding Lives. Further Reading: New Forums for Justice. Thinking about Sexual Violence (Towards a World of Equals: Unit-11)Blaming the Victim-"I Fought for my Life…." – Further Reading: The Caste Face of Violence.

Unit-V

GENDER STUDIES:

Knowledge: Through the Lens of Gender (Towards a World of Equals: Unit-5)
Point of View. Gender and the Structure of Knowledge. Further Reading:
Unaknowledged.Women Artists of Telangana.Whose History? Questions for Historians and Others (Towards a World of EqualsReclaiming a Past. Writing other Histories.
Further Reading: Missing Pages from Modern Telangana History.Essential Reading: All the Units in the Textbook, "Towards a World of Eqals: A Bilingual Textbook on Gender" written by A.Suneetha, Uma Bhrugubanda, Duggirala Vasanta, Rama Melkote, Vasudha Nagarj, Asma Rasheed, Gogu Shyamala, Deepa Sreenivas and Susie Tharu.

Note: Since it is Interdisciplinary Course, Resource Persons can be drawn from the fields of English Literature or Sociology or Political Science or any other qualified faculty who has expertise in this field.

Reference Books:

1. Sen, Amartya, "More than One Million Women are Missing." New York Review of Books 37.20 (20 December 1990). Print. 'We Were Making Hisoty…' Life Stories of Women in the Telangana People's Struggle. New Delhi: Kali for Women, 1989.
2. Tripti Lahiri. "By the Numbers: Where Indian Women Work." Women's Studies Journal (14 November 2012) Available online at:http://blogs.wsj.com/ India real time/2012/11/14/by-the-numbers-where-Indian-women-work/>
3. K.Satyanarayana and Susie Tharu (Ed.) Steel Nibs Are Sprouting: New Dalit Writing From South India, Dossier 2, Telugu and Kannada http://harpercollings.co.in/BookDetail.asp?Book Code=3732

4. Vimala. “Vantilliu (The Kitchen)”. Women Writing in India: 600 Bc To the Present, Volume It: The 20th Century, Ed. Susie Tharu and K.Lalitha. Delhi: Oxford University Press, 1995. 599-601.
5. Shatrunghna, Veena et al. Women’s Work and its impact on Child Health and Nutrition, Hyderabad, National Institute of Nutrition, Indian Council of Medical Research, 1993.
6. Stree Shakti Sanghatana. “We Were Making History…’ Life Stories of Women in the Telangana People’s Struggle, New Delhi: Kali for Women, 1989.
7. Menon, Nivedita, Seeing like a Feminist. New Delhi: Zubaan-Penguin Books, 2012
8. Jayaprabha, A. “Chupulu (Stares)”. Women Writing in India: 600BC to the Present. Volume II: The 20th Century Ed. Susie Tharu and K.Lalita, Delhi: Oxfor Univerity Press. 1995, 596-597.
9. Javeed. Shayan and Anupam Manuhaar. “Women and Wage Discrimination in India: A Critical Analysis.” International Journal of Humanities and Social Science Invention 2,.4 (2013).
10. Gautam, Liela and Gita Ramaswamy. “A ‘conversation’ between a Daughter and a Mother.” Broadsheet on Contemporary Politics. Special Issue on Sexuality and Harassment: Gender Politics on Campus Today. Ed. Madhumeeta Sinha and Asma Rasheed. Hyderabad: Anveshi Research Center for Women’s Studies, 2014.
11. Abdulali Sohaila. “I Fought For My Life… and Won.” Available online at: http://www.thealternative.in/lifestyle/i-fought-for-my-lifeand-won-sohaila-abdulal/
12. Jeganathan pradeep, Partha Chatterjee (Ed). “Community, Gender and Violence Subaltern Studies XI”. Permanent Black Ravi Dayal Publishers, New Delhi, 2000.
13. K.Kapadia. The Violence of Development: The Politics of Identity, Gener and Social Inequalities in India. London: Zed Books, 2002.
14. S.Benhabib. Situating the Self: Gender, Community, and Postmodernism in Contemporary Ethics, London: Routledge, 1992.
15. Virginia Woolf. A Room of One’s Own, Oxford: Black Swan, 1992.
16. T.Banuri and M. Mahmood, Just Development Beyond Adjustment with a Human Face, Karachi: Oxford University Press, 1997.

ANURAG GROUP OF INSTITUTIONS
(AUTONOMOUS)

II Year B.Tech. IT - I Sem	L	T / P / D	C
	0	3	2

(A53213) ELECTRONIC DEVICES AND ELECTRICAL CIRCUITS LAB

Prerequisites: A parallel course on electronic devices, electrical circuits and basic electrical engineering

PART A:

1. Verification of Kirchoff's current law and Kirchoff's voltage law.
2. Verification of Superposition theorem.
3. Verification of maximum power transfer theorem for DC circuits.
4. Verification of Thevenin's theorem.
5. Characteristics of DC shunt generator.
6. Swinburne's test on DC shunt machine.
7. Brake test on DC shunt motor.
8. OC & SC tests on single phase transformer.
9. Brake test on 3 phase induction motor.

PART B:

1. PN Junction Diode characteristics.
2. Zener diode characteristics.
3. Transistor CE characteristics.
4. Rectifier without filters.
5. Rectifiers with filters.

NOTE:

Any 5 experiments from Part – A

All 5 experiments from Part – B

ANURAG GROUP OF INSTITUTIONS
(AUTONOMOUS)

II Year B.Tech. IT - I Sem	L	T / P / D	C
	0	3	2

(A53214) DATA STRUCTURES LAB

Prerequisites: Any programming language and a parallel course on data structures.

Course Outcomes:

1. Develop the programs on stacks and its applications.
2. Demonstrate the operations on trees.
3. Demonstrate the implementation of various advanced trees.
4. Design and implementation of programs on BST and Graph Traversals.

Part-A

1. Program to illustrate string built in functions
2. Program to evaluate postfix notations
3. Program to convert infix to postfix notation
4. Program to illustrate tree traversals
    a) In order b) Preorder c) Post order
5. Program to illustrate insertion, deletion and searching in Binary Search Tree.
6. Program to illustrate Graph traversals
    a) Breadth First Search
    b) Depth First Search
7. Program to illustrate Insertion, deletion and Rotation on AVL Trees.

Part-B

1. Program to illustrate Function Overloading to calculate area of a circle, rectangle and square
2. Program to illustrate virtual function
3. Program to illustrate default constructor, parameterized constructor and copy constructors
4. Program to illustrate single Inheritance, multiple inheritance, multilevel inheritance, hybrid inheritance
5. Program to illustrate run time polymorphism, compile time polymorphism
6. Program to illustrate Operator Overloading

    a)Unary Operator b) Binary Operator

7. Program to illustrate Exception Handling Mechanisms using try, catch, throw keywords
8. Program to illustrate formatted and unformatted I/O streams

ANURAG GROUP OF INSTITUTIONS
(AUTONOMOUS)

II Year B.Tech. IT – II Sem	L	T / P / D	C
	3	0	3

(A54006) ENVIRONMENTAL STUDIES

Prerequisites: Engineering chemistry

Course Objectives:

1. To introduce the knowledge about Environment.
2. To introduce students to the concepts of pollution, Biodiversity
3. To develop an awareness about global Environmental problems.
4. To learn to protect environment, legal issues, Sustainable development

Course Outcomes:

1. Conservation of natural resources.
2. Understand Requirement to conserve environment.
3. Understand the National and international efforts to save globe.
4. Know importance of sustainable development.
5. Impart basic knowledge, awareness & Skills for solving real life environmental problems in order to improve the quality of life.

Unit I:

Multidisciplinary nature of Environmental Studies: Definition, Scope and Importance – Need for Public Awareness. (a) Ecosystems: Concept of an ecosystem – Classification, structure and function of different ecosystems - Producers, consumers and decomposers. - Energy flow in the ecosystem - Ecological succession - Food chains, food webs and ecological pyramids.

(b) Biodiversity and its conservation: Introduction - Definition: genetic, species and ecosystem diversity. - Bio-geographical classification of India - Value of biodiversity: consumptive use, productive use, social, ethical, aesthetic and option values. India as a mega-diversity nation - Hot-spots of biodiversity - Threats to biodiversity: habitat loss, poaching of wildlife, man-wildlife conflicts. ICUN categories of biodiversity and RED DATA book - Conservation of biodiversity: In-situ and Ex-situ conservation of biodiversity.

Unit II:

Natural Resources : Renewable and non-renewable – Natural resources and associated problems: Forest resources – Use and over – exploitation, deforestation,– Timber extraction, mining, dams and other effects on forest and tribal people: Water resources – Use and over utilization of surface and ground water – Floods, drought, conflicts over water, dams – benefits and problems – Mineral resources: Use and exploitation, environmental effects of extracting and using mineral resources. - Food resources: World food problems, changes

caused by agriculture and overgrazing, effects of modern agriculture, fertilizer-pesticide problems, water logging, salinity. - Energy resources: Growing energy needs, renewable and non-renewable energy sources use of alternate energy sources. Land resources: Land as a resource, 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 III :

(a) Environmental Pollution: Definition, Cause, effects and control measures of different kinds of pollution (Air, Water , Soil , Marine , Noise , Thermal, Nuclear, e –Waste)

(b) Social Issues and the Environment: From Unsustainable to Sustainable development - Urban problems related to energy -Water conservation, rain water harvesting, and watershed management. -Climate change, global warming, ozone layer depletion, nuclear accidents and holocaust.

Unit IV :

(a) Waste management technology: Solid waste Management: Causes, effects and control measures of urban and industrial wastes. - Role of an individual in prevention of pollution, Disaster management: floods, earthquake, cyclone and landslides. Waste water and sewage treatment technology: primary, secondary and tertiary treatments. Bioremediation, Phyto-remediation, ZLD (zero liquid discharge), membrane technology.Application of GIS and GPS system in environmental science.

(b) Environmental policy, Rules and regulations. EIA (Environmental Impact Assessment) & EMP (ENVIRONMENTAL Management Plan) – Environment Protection Act. - Air (Prevention and Control of Pollution) Act. -Water (Prevention and control of Pollution) Act - Wildlife Protection Act –Forest Conservation Act.-Public awareness. Global environmental problems and global efforts.

Unit V :

(a) Towards sustainable future: concept of sustainable development, threats of sustainability, population and its explosion, over exploitation of resources, strategies for achieving sustainable development. Environmental education, Conservation of resources.Urban sprawl, sustainable cities and sustainable communities, human health. Role of IT in environment, environmental ethics, concept of green building, Basic principles of Green engineering, clean development mechanism (CDM), Low carbon life cycle, Polluters-pay principle.

(b) Field work: Visit to a local area to document environmental assets River/forest grassland/hill/ mountain Visit to a local polluted site-Urban/Rural/industrial/ Agricultural Study of common plants, insects, birds, Visit to effluent treatment plant/sewage treatment plant Study of simple eco systems pond, river, hill slopes, etc. Mini projects by students which is mandatory.

Text Books:

1. Erach Bharucha for University Grants Commission ,Textbook of Environmental Studies for Undergraduate Courses by, University Press.
2. R.Rajagopalan ,Environmental studies, From Crisis to cure ,2005

Reference Books:

1. Richard T.Wright, Environmental Science: towards a sustainable future, PHL Learning Private Ltd .New Delhi, 2008.
2. Gilbert M.Masters and Wendell P.Ela, Environmental Engineering and science, PHI Learning Pvt. Ltd.,2008.

ANURAG GROUP OF INSTITUTIONS
(AUTONOMOUS)

II Year B.Tech. IT – II Sem	L	T / P / D	C
	3	1	3

(A54024) DESIGN AND ANALYSIS OF ALGORITHMS

Prerequisites: Data structures and any programming language

Course Objectives:

1. Analyze the asymptotic performance of algorithms.
2. Paradigms and approaches used to analyze and design algorithms and to appreciate the impact of algorithm design in practice.
3. Synthesize efficient algorithms in common engineering design situations.
4. To utilize data structures and algorithmic design techniques in solving new problems

Course Outcomes:

1. Acquire the knowledge of algorithm analysis and its notations that are applied on the problems solved by divide and conquer paradigm.
2. Apply the major graph algorithms for model engineering problems and knowledge of the greedy paradigm
3. Apply the dynamic-programming paradigm and recite algorithms that employ this paradigm.
4. Apply the concept of back tracking, branch and bound paradigm for real time problems.
5. Analyze the complexity of problems and differentiate that in terms of P and NP problems with examples.

Unit I :

Introduction: Algorithm, Pseudo code for expressing algorithms, Performance Analysis-Space complexity, Time complexity, Asymptotic Notation- Big oh notation, Omega notation, Theta notation and Little oh notation, Probabilistic analysis, Disjoint Sets- disjoint set operations, union and find operations.

Divide and conquer: General method, applications-Binary search, Quick sort, Merge sort, Strassen's matrix multiplication.

Unit II :

Graphs: breadth first search, depth first search, spanning trees, connected and bi connected components

Greedy method: General method, applications-Job sequencing with dead lines, 0/1 knapsack problem, Minimum cost spanning trees, Single source shortest path problem.

Unit III :

Dynamic Programming: General method, applications-Matrix chain multiplication, Optimal binary search trees, 0/1 knapsack problem, All pairs shortest path problem, Travelling sales person problem, Reliability design.

Unit IV :

Backtracking: General method, applications-n-queen problem, sum of subsets problem, graph coloring, Hamiltonian cycles.

Branch and Bound: General method, applications - Travelling sales person problem,0/1 knapsack problem- LC Branch and Bound solution, FIFO Branch and Bound solution.

Unit V :

Lower Bound Theory : Comparison trees ,NP-Hard and NP-Complete problems: Basic concepts, non deterministic algorithms, NP - Hard and NP Complete classes, Clique Decision Problem(CDP), Node cover decision problem.

Text Books:

1. Ellis Horowitz, Satraj Sahni and Rajasekharam, Fundamentals of Computer Algorithms, , Galgotia publications pvt. Ltd, Second Edition, 2007.
2. Aho, Ullman and Hopcroft,Design and Analysis of algorithms, Pearson education, Reprint 2002.

Reference Books:

1. R.C.T.Lee, S.S.Tseng, R.C.Chang and T.Tsai,Introduction to Design and Analysis of Algorithms A strategic approach, Mc Graw Hill,2005.
2. Allen Weiss,Data structures and Algorithm Analysis in C++,Third edition, Pearson education

ANURAG GROUP OF INSTITUTIONS
(AUTONOMOUS)

II Year B.Tech. IT – II Sem	L	T / P / D	C
	3	1	3

(A54025) COMPUTER ORGANIZATION

Prerequisites: Digital logic design

Course Objectives:

1. Understand instruction format, life cycle and CPU Architecture and Organization
2. Know the basic Architecture of Microprocessor.
3. Understand different types of I/O interfaces.
4. Familiar with the concepts of pipelining techniques.
5. Understand the Multiprocessor concepts

Course Outcomes:

1. Understand the basic organization of computer and different instruction formats and addressing modes.
2. Analyze the concept of pipelining, segment registers and pin diagram of CPU.
3. Understand and analyze various issues related to memory hierarchy.
4. Evaluate various modes of data transfer between CPU and I/O devices.
5. Examine various inter connection structures of multi processors.

Unit I :

Instruction: Instruction Definition, instruction cycle,flow chart for instruction cycle,instruction storage, types of instruction formats (Zero, one, two and three address). Addressing modes: mode field, implied, immediate register, register direct, register indirect, auto increment, decrement, indexed, relative, base address mode, Numerical examples and problems.

Unit II :

CPU-Organization: 8086 – CPU – Block diagram and pin diagram, concept of pipelining, minimum and maximum mode, General purpose registers; segment register and generation of 20 bits address, segmentation of main memory, Addressing modes, systems bus, Types of flags.

Unit III :

Memory Hierarchy, Main memory, memory address map, memory connection to CPU; auxiliary memory, Magnetic disks, magnetic tapes; cache memory, hit and miss ratio, direct, associative and set associative mapping;Micro-programmed control: control memory, address sequencing.

Unit IV:

I/O interface: I/O Bus and Interface modules, I/O versus Memory Bus, isolated vs Memory-mapped I/O. Asynchronous data transfer-strobe control, Hand shaking; Modes of Transfer: Example of programmed I/O, interrupt-initiated I/O, software considerations. Daisy-Chaining priority. DMA: DMA Controller, DMA Transfer, Intel 8089 IOP.

Unit V:

Multi Processors: Characteristics of Multi-Processor; Interconnection structures: Time shared common bus, multiport memory, crossbar switch, multi-stage switching network; Introduction to Flynn's classification**:** SISD, SIMD, MISD, MIMD (Introduction).

Text Books:

1. M. Morris Mano, Computer System Architecture, Third Edition, Pearson/PHI, 2011.
2. Douglas V Hall, Microprocessor and Interfacing, Second Edition, TATA McGraw Hill, 2006.

Reference Books:

1. Carl Hamacher, ZvonksVranesic, SafeaZaky, Computer Organization, 5th Edition, McGraw Hill, 2002.
2. William Stallings, Computer Organization and Architecture, 6th Edition, Pearson/PHI, 2007.

ANURAG GROUP OF INSTITUTIONS
(AUTONOMOUS)

II Year B.Tech. IT – II Sem	L	T / P / D	C
	3	0	3

(A54026) DATABASE MANGEMENT SYSTEMS

Prerequisites: Any programming language

Course Objectives:

1. To provide a sound introduction to Database management systems, Databases and its applications,
2. To familiarize the participant to give a good formal foundation on the relational model of data
3. To present SQL and procedural interfaces to SQL comprehensively
4. To give an introduction to systematic database design approaches conceptual design, logical design ,schema refinement and physical design
5. To introduce the concepts of transactions and transaction are processing and the issues and techniques relating to concurrency and recovery manager.

Course Outcomes:

1. Design Entity-Relationship Model for enterprise level databases.
2. Develop the database and provide restricted access to different users of database and formulate the Complex SQL queries.
3. Analyze various Relational Formal Query Languages and various Normal forms to carry out Schema refinement
4. Use of suitable Indices and Hashing mechanisms for real time implementation.
5. Ability to analyze various concurrency control protocols and working principles of recovery algorithms.

Unit I :

Introduction to Database System Concepts: Database-System Applications, Purpose of Database Systems, View of Data, Database Language, Database Design, Database Architecture, Database Users and Administrators.

Introduction to the Relation Models and Database Design using ER Model: Structure of Relational Databases, Database Schema, Keys, Schema Diagrams, Relational Query Languages, Relational Operations Overview of the Design Process, The Entity-Relationship Model, Constraints, Removing Redundant Attributes in Entity Sets, Entity-Relationship Diagrams, Reduction to Relational Schemas, Entity-Relationship Design Issues, Extended E-R Features

Unit II:

Introduction to SQL: Overview of the SQL Query Language, SQL Data Definition, Basic Structure of SQL Queries, Additional Basic Operations, Set Operations, Null Values, Aggregate Functions Nested Sub queries, Modification of the Database.

Intermediate and Advanced SQL: Join Expressions, Views , Integrity Constraints, SQL Data Types, Authorization. Functions and Procedures, Triggers, Advanced Aggregation Features.

Unit III :

Formal Relational Query Languages: The Relational Algebra, Tuple Relational Calculus, The Domain Relational Calculus.

.**Relational Database Design:** Features of Good Relational Designs, Atomic Domains and First Normal Form, Decomposition Using Functional Dependencies, Decomposition Using Multi valued Dependencies, More Normal Forms.

Unit IV:

Indexing and Hashing: Basic Concepts, Ordered Indices, B+-Tree Index Files, B+-Tree Extensions, Multiple-Key Access, Static Hashing, Dynamic Hashing, Comparison of Ordered Indexing and Hashing, Bitmap Indices.

Transactions: Transaction Concept, A Simple Transaction Model, Storage Structure, Transaction Atomicity and Durability, Transaction Isolation, Serializability, Transaction Isolation and Atomicity, Transaction Isolation Levels.

Unit V :

Concurrency Control: Lock-Based Protocols, Deadlock Handling, Multiple Granularity, Timestamp-Based Protocols, Validation-Based Protocols, Multi version schemes.

Recovery System: Failure Classification, Storage, Recovery and Atomicity, Recovery Algorithm, Buffer Management, Failure with Loss of Nonvolatile Storage, ARIES, Remote Backup Systems.

Text Books:

1. Abraham Silberschatz, Henry F. Korth, S. Sudarshan, Database System Concepts, Sixth Edition, Tata Mc Graw-Hill 2006.
2. Raghu Rama Kirshna, Johannes Gchrke, Database Management System, Third Edition, TATA MC Graw Hill, 2003.

Reference Books:

1. Peter Rob & Carlos Coronel, Data base Systems design, Implementation and Management ,7th Edition, 2007.
2. Ramez Elmasri, Shamkanth B. Navrate, Fundamentals of Database Systems, Pearson Education, 2008.
3. 3.C.J. Date ,Introduction to Database Systems, Pearson Education

ANURAG GROUP OF INSTITUTIONS
(AUTONOMOUS)

II Year B.Tech. IT – II Sem	L	T / P / D	C
	3	0	3

(A54027) SOFTWARE ENGINEERING

Prerequisites: Any programming language

Course objectives

1. Understand the framework activities for a given project.
2. Choose a process model to apply for given project requirements.
3. Design various system models for a given scenario.
4. Design and apply various testing techniques.
5. Understand metrics for Process and Products.

Course Outcomes:

1. Choose a process model to apply for given project requirements.
2. Analyze and apply the framework activities for a given project.
3. Design various system models for a given scenario.
4. Design and apply various testing techniques.
5. Understand metrics for Process and Products.

Unit I:

Introduction to Software Engineering: The evolving role of software, Changing Nature of Software, Software myths. A Generic view of process: Software engineering- A layered technology, a process framework, The Capability Maturity Model Integration (CMMI), personal and team process models.

Unit II:

Process models: The waterfall model, Incremental process models, Evolutionary process model, Agile process. Software Requirements: Functional and non-functional requirements, the software requirements document. Requirements engineering process: Feasibility studies, Requirements elicitation and analysis, Requirements validation, Requirements management

Unit III:

System models: Context Models, Behavioural models, Data models, Object models, structured methods. Design Engineering: Design process and Design quality, Design concepts, the design model, Modelling component level design: design class based components,conductingcomponentlevel design. Performing User interface design: Golden rules.

Unit IV:

Testing Strategies: A strategic approach to software testing, test strategies for conventional software, Black-Box and White-Box testing, Validation testing, System testing, Product

metrics : Software Quality, Metrics for Analysis Model- function based metrics, Metrics for Design Model-object oriented metrics, class oriented metrics, component design metrics, Metrics for source code, Metrics for maintenance.

Unit V:

Metrics for Process and Products: Metrics for software quality. Risk management: Reactive vs. Proactive Risk strategies, software risks, Risk identification, Risk projection, Risk refinement, RMMM, RMMM Plan. Quality Management: Quality concepts, Software Reviews, Formal technical reviews, Software reliability, The ISO 9000 quality standards.

Text Books:

1. Roger S. Pressman, Software Engineering - A practitioner‘s Approach, 6th edition. McGraw Hill International Edition, 2005.
2. Sommerville, Software Engineering, 7th edition, Pearson education,2009 .

Reference Books:

1. K.K. Agarwal & Yogesh Singh, Software Engineering, New Age International Publishers,3rd edition, 2008
2. James F. Peters, Witold Pedrycz, Software Engineering - an Engineering approach, JohnWiely, 2007.
3. ShelyCashmanRosenblatt,Systems Analysis and Design, Thomson Publications.
4. Waman S Jawadekar, Software Engineering Principles and Practice, The McGraw-Hill Companies, 2013.

ANURAG GROUP OF INSTITUTIONS
(AUTONOMOUS)

II Year B.Tech. IT – II Sem	L	T / P / D	C
	3	0	3

(A54028) JAVA PROGRAMMING

Prerequisites: Any programming language

Course Objectives:

1. Understand the concept of OOP and learn the basic syntax and semantics of the Java language and programming environment
2. Be familiar with the purpose and usage principles of inheritance, polymorphism, encapsulation and method overloading.
3. Understand Exceptional handling and multithreading concepts
4. Be familiar with GUI applications.

Course Outcomes:

1. Design, write and test a java program to implement a working Understand the fundamental concepts of the object oriented paradigm and their implementation in the Java programming language.
2. Write code to define classes and interfaces that uses class libraries such as java.lang, java.util, java.io.
3. Use exception handling and multithreading in programs.
4. Develop GUI applications.
5. Give object oriented solutions for the complex and real world problems.

Unit I :

Fundamentals of Object Oriented Programming: Object-Oriented Paradigm, Basic Concepts of Object Oriented Programming- Objects and Classes, Data abstraction and encapsulation, inheritance ,Polymorphism, Data binding, Message Communication, Benefits of OOP, Applications of OOP. **Java Basics** History of Java, Java buzzwords, data types, variables, scope and life time of variables, arrays, operators, expressions, control statements, type conversion and costing, simple java program, concepts of classes, objects, constructors, methods, access control, this keyword, garbage collection, overloading methods and constructors, parameter passing, recursion, nested and inner classes, Strings.

Unit II :

Inheritance – Base class object, subclass, subtype, substitutability, forms of inheritance-specialization, specification, construction, extension, limitation, combination, Member access rules, super uses, using final with inheritance, polymorphism- method overriding, abstract classes, Object class **Packages and Interfaces** : Defining, Creating and Accessing a Package,

Understanding CLASSPATH, importing packages, differences between classes and interfaces,File, Byte Streams, Character Streams, Stream I/O.

Unit III :

Exception handling - Concepts of exception handling, exception hierarchy, usage of try, catch, throw, throws and finally, built in exceptions, creating own exception sub classes. Package java.util- The Collection Interface,list interface, Queue interface,The Collection class:LinkedListClass,HashSetClass.TreeSetClass, StringTokenizer, Date, Random, Scanner. **Multi threading**: Differences between multi threading and multitasking, thread life cycle, creating threads, thread priorities, synchronizing threads, inter thread communication.

Unit IV:

Event Handling: Events, Event sources, Event classes, Event Listeners, Delegation event model, handling mouse and keyboard events, Adapter classes. **AWT:** class hierarchy, component, container, panel, window, frame, canvas, graphics, Layout Manager – layout manager types – boarder, grid, flow, card and grib bag.

Unit V:

AWT controls: Labels, button, canvas, scrollbars, text components, check box, check box groups, choices, lists panels – scroll pane, dialogs, menu bar. **Applets** – Concepts of Applets, differences between applets and applications, life cycle of an applet, create applets, passing parameters to applets. **JDBC Connectivity**: JDBC Type 1 to 4 Drivers,connectionestablishment, QueryExecution.

Text Books:

1. Herbert schildt ,Java- the complete reference, Seventh edition, Tata McGraw Hill.
2. GeorgeReese ,Database Programming with JDBC&JAVA, Second Edition, O'ReillyMedia.

Reference Books:

1. Thinking in Java Fourth Edition, Bruce Eckel
2. Introduction to Java programming, Y. Daniel Liang, pearson education.
3. Understanding OOP with Java, updated edition, T. Budd, pearsoneduction.

ANURAG GROUP OF INSTITUTIONS

(AUTONOMOUS)

II Year B.Tech. IT - II Sem	L	T / P / D	C
	2	0	0

(A54029) LOGICAL REASONING AND QUANTITATIVE APTITUDE – I

Prerequisites: Basic mathematics of 10+2 (intermediate) standard

Course Outcomes:

1. Enhance the problem-solving ability of the students with focusing on basic concepts of arithmetic, algebra, geometry data analysis.
2. Demonstrate various principles involved in solving mathematical problems and thereby reducing the time taken for performing job functions.

Unit I :

Series Completion: Number Series, Alphabet Series, Alpha – Numeric Series.

Analogy: Completing the Analogous Pair, Simple Analogy, Choosing the Analogous Pair, Double Analogy, Word Analogy and Number Analgoy.

Unit II:

Classification / Odd One Out: Word Classification, Number Classification, Letter Classification.Coding – Decoding : Letter Coding, Number Coding, Matrix Coding, Substitution, Deciphering Message Word Codes, Jumbled coding.

Unit III:

Blood Relations : Deciphering Jumbled up Descriptions, Relation Puzzle – Direction sense test. Number, Ranking & Time Sequence Test – Arithmetical Reasoning – Mathematical Operations.

Unit IV :

Number System : Test for Divisibility, Test of prime number, Division and Remainder – HCF and LCM of Numbers – Fractions.

Unit V :

Ratio and Proportion : Properties of Ratio, Comparison of Ratios, Useful Simple Results on Proportion – Partnership and Share – Mixtures.

Text Books:

1. Verbal and Non Verbal Reasoning by R.S.Agarwal.
2. Quantitative Aptitude by R.S.Agarwal.
3. Quantitative Aptitude by Abhijit Guha.

ANURAG GROUP OF INSTITUTIONS
(AUTONOMOUS)

II Year B.Tech. IT – II Sem	L	T / P / D	C
	0	3	2

(A54217) JAVA PROGRAMMING LAB

Prerequisites: Data structures and a parallel course on Java Programming.

Course Outcomes:

1. Familiarize with Java Environment and use of Java Development Kit for the creation and execution of java programs
2. Develop programs on various concepts like data abstraction & data hiding, encapsulation, inheritance, polymorphism.
3. Create and use threads, handle exceptions and write applets.
4. Develop the programs using interfaces, inner classes, wrapper classes and generics.
5. Develop GUI applications.

Week 1:-

1) Write a program to find total, average of given two numbers by using function with default arguments ,static data members and this keyword?

2) Write a program to illustrate class and objects (Banking operations)

Week 2:-

3) Write a program to illustrate constructors?(Inventory of Books)

4) Write a program to create a class complex with necessary operator overloading and type conversion such as integer to complex, complex to double.

Week 3:-

5)Write a program that randomly generates complex numbers and write two numbers per line in a file along with an operator(+,-,P,*,/) .The numbers are written to file in the format (a+ib)

6) Write a program to read online at a time, perform the corresponding operation on two complex numbers read, write the result to another file (one per line)

Week 4:-

7) Write a program to illustrate inheritance (Student Evaluation)

8) Write a java program to handle the situation of exception handling.

Week 5:-

9) Write a java program to demonstrate the concept of polymorphism.

10) Write a java program to illustrate Method Overriding?

Week 6:-

11) Write a java program to illustrate Method overloading of assignment operator?

12) Write a program to illustrate Array Manipulation?

Week 7:-

13) Write a program to illustrate Synchronization?

14) Write a program to String Tokenizer?

Week 8:-

15) Write a program to implement the concept of User defined Exceptions.

16) Write a program to illustrate the use of creation of packages.

Week 9:-

17) Write a program to illustrate Multithreading and Multitasking?

18) Write a program to illustrate thread priorities.

Week 10:-

19) Write a program to illustrate applet concept.

Week 11:-

20) Write a program to illustrate Event Handling(key board, Mouse events)

Week 12:-

21) Write a program to develop a calculator application using AWT.

Week 13:-

22) Write a program to illustrate JDBC.

ANURAG GROUP OF INSTITUTIONS
(AUTONOMOUS)

II Year B.Tech. IT – II Sem	L	T / P / D	C
	0	3	2

(A54218) DATABASE MANAGEMENT SYSTEMS LAB

Prerequisites: A parallel course on data base management systems.

Course Outcomes:

1. Use the SQL commands such as DDL, DML, DCL, TCL to create, manipulate, access data from database objects and providing authorization to access database by different users.
2. To apply various integrity Constraints on the database tables for preserving the integrity of the database.
3. Design and implement Pl/SQL programs which include procedures, functions, cursor and triggers.

1.Database Schema for a customer-sale scenario

Customer(**Cust id : integer,** cust_name: string)

Item(**item_id: integer,**item_name: string, price: integer)

Sale(**bill_no: integer,** bill_data: date, **cust_id: integer, item_id: integer**, qty_sold: integer)

For the above schema, perform the following—

a) Create the tables with the appropriate integrity constraints

b) Insert around 10 records in each of the tables
c) List all the bills for the current date with the customer names and item numbers
d) List the total Bill details with the quantity sold, price of the item and the final amount
e) List the details of the customer who have bought a product which has a price>200
f) Give a count of how many products have been bought by each customer
g) Give a list of products bought by a customer having cust_id as 5
h) List the item details which are sold as of today
i) Create a view which lists out the bill_no, bill_date, cust_id, item_id, price, qty_sold, amount

Create a view which lists the daily sales date wise for the last one week

2 Database Schema for a Student Library scenario

Student(**Stud_no : integer,**Stud_name: string)

Membership(**Mem_no: integer**,**Stud_no: integer**)

Book(**book_no: integer**, book_name:string, author: string)

Iss_rec**(iss_no:integer**, iss_date: date, **Mem_no: integer**, **book_no: integer**)

For the above schema, perform the following—

a) Create the tables with the appropriate integrity constraints
b) Insert around 10 records in each of the tables
c) List all the student names with their membership numbers
d) List all the issues for the current date with student and Book names
e) List the details of students who borrowed book whose author is CJDATE
f) Give a count of how many books have been bought by each student
g) Give a list of books taken by student with stud_no as 5
h) List the book details which are issued as of today
i) Create a view which lists out the iss_no, iss _date, stud_name, book name
j) Create a view which lists the daily issues-date wise for the last one week

3 Database Schema for a Employee-pay scenario

employee(**emp_id : integer**,emp_name: string)

department(**dept_id: integer**,dept_name:string)

paydetails(**emp_id : integer**,**dept_id: integer**, basic: integer, deductions: integer, additions: integer, DOJ: date)

payroll**(emp_id : integer**, pay_date: date)

For the above schema, perform the following—

a) Create the tables with the appropriate integrity constraints
b) Insert around 10 records in each of the tables
c) List the employee details department wise
d) List all the employee names who joined after particular date
e) List the details of employees whose basic salary is between 10,000 and 20,000
f) Give a count of how many employees are working in each department
g) Give a names of the employees whose netsalary>10,000
h) List the details for an employee_id=5
i) Create a view which lists out the emp_name, department, basic, dedeuctions, netsalary
j) Create a view which lists the emp_name and his netsalary

4 Database Schema for a Video Library scenario

Customer(cust_no: integer,cust_name: string)

Membership(**Mem_no: integer**, **cust_no: integer**)

Cassette(**cass_no:integer**, cass_name:string, Language: String)

Iss_rec(**iss_no: integer**, iss_date: date, **mem_no: integer**, **cass_no: integer**)

For the above schema, perform the following—

a) Create the tables with the appropriate integrity constraints
b) Insert around 10 records in each of the tables
c) List all the customer names with their membership numbers
d) List all the issues for the current date with the customer names and cassette names
e) List the details of the customer who has borrowed the cassette whose title is " The Legend"
f) Give a count of how many cassettes have been borrowed by each customer
g) Give a list of book which has been taken by the student with mem_no as 5
h) List the cassettes issues for today
i) Create a view which lists outs the iss_no, iss_date, cust_name, cass_name
j) Create a view which lists issues-date wise for the last one week

5 Database Schema for a student-Lab scenario

Student(**stud_no: integer**, stud_name: string, **class: string**)

Class(**class: string,descrip: string**)

Lab(**mach_no: integer**, Lab_no: integer, description: String)

Allotment(**Stud_no: Integer, mach_no: integer, dayof week: string)**

For the above schema, perform the following—

a) Create the tables with the appropriate integrity constraints
b) Insert around 10 records in each of the tables
c) List all the machine allotments with the student names, lab and machine numbers
d) List the total number of lab allotments day wise
e) Give a count of how many machines have been allocated to the 'CSIT' class
f) Give a machine allotment etails of the stud_no 5 with his personal and class details
g) Count for how many machines have been allocatedin**Lab_no 1** for the day of the week as "Monday"
h) How many students class wise have allocated machines in the labs
i) Create a view which lists out the stud_no, stud_name, mach_no, lab_no, dayofweek
j) Create a view which lists the machine allotment details for "Thursday".

6	Write a program to find largest number from the given three numbers.
7	Simple programs using loop, while and for iterative control statement.
8	Write a program to check whether the given number is Armstrong or not
9	Write a program to generate all prime numbers below 100.
10	Write a program to demonstrate the GOTO statement.
11	Write a program to demonstrate %type and %rowtype attributes
12	Write a program to demonstrate predefined exceptions
13	Write a program to demonstrate user defined exceptions
14	Create a cursor, which displays all employee numbers and names from the EMP table.
15	Create a cursor, which update the salaries of all employees as per the given data.
16	Create a cursor, which displays names of employees having salary > 50000.
17	Create a procedure to find reverse of a given number
18	Create a procedure to update the salaries of all employees as per the given data
19	Create a procedure to demonstrate IN, OUT and INOUT parameters
20	Create a function to check whether given string is palindrome or not.
21	Create a function to find sum of salaries of all employees working in depart number 10.
22	Create a trigger before/after update on employee table for each row/statement.
23	Create a trigger before/after delete on employee table for each row/statement.
24	Create a trigger before/after insert on employee table for each row/statement.
25	Create a Form to display employee details using SQL
26	Create a Report to generate all employee annual salaries

ANURAG GROUP OF INSTITUTIONS
(AUTONOMOUS)

II Year B.Tech. IT - II Sem	L	T / P / D	C
	0	3	2

(A54219) SOFT SKILLS AND PERSONALITY DEVELOPMENT

Prerequisites: Basic English language

Course Outcomes:

1. Improve the functional effectiveness through better written and oral communication skills.
2. Improve managerial capabilities through team building and group dynamics
3. Develop their leadership skills.
4. Prioritize their tasks through effective time management.
5. Design and Present their presentation skills effectively.

1. Self-Assessment
- SWOT
- Presentation of Action Plan
- Acquisition of Employability Skills
- Enhancement of Clarity in Communication
- Practical Activities

2. Motivation and Goal Setting
- Self Motivation
- Pushing yourself beyond imagination
- Role Model
- Practical Activities
- Goal Setting- Process
- Practical Activities

3. Self- Confidence
- Command on Language
- Command on Subject
- Self Efficacy
- Self Esteem
- Self Competence
- Practical Activities

4. Time Management
- Procrastination
- Prioritisation
- Valuing Others Time
- Setting Timelines
- Activities
- Practical Session

5. Etiquette and Grooming

- Personal Habits
- Dressing Sense
- Behavior Control
- General Etiquette
- Situational Courtesies
- Practical Sessions

6. Presentation Skills and Public Speaking

- Techniques of Presentation Skills
- Extempore Speaking
- Body Posture (Non-Verbal Communication)
- Personal Grooming
- Public Speaking
- Role Play on above topics

Text Books:

1. Studying Lives Through Time: Personality and Development by Lunder, D.C; Parke, R.D; Tomlinson-Keasey&Widaman (eds)1996. Cambridge University press(CUP).
2. Handbook of Personality Development – Mroczex& Little (eds).2006.

Reference Books:

1. The Cambridge handbook of Personality Psychology,Corr& Mathews(eds) 2009, Cambridge University press.
2. Personality and Intelligence at work: Exploring and Explaining Individual differences at work, Lurnham.A.2007,

ANURAG GROUP OF INSTITUTIONS
(AUTONOMOUS)

III Year B.Tech. IT –I Sem	L	T/P/D	C
	3	1	3

(A55040) FORMAL LANGUAGES AND AUTOMATA THEORY

Prerequisites: Discrete mathematics, and any programming language

Course Objectives:

1. Familiar with concepts of NFA And DFA
2. Understand various Grammars like Regular grammars-right linear and left linear grammars
3. Familiar with concept of PDA
4. Aware of the concept of Turing Machines

Course Outcomes:

1. Appreciate the role and structure of Language theory.
2. Design of regular expressions for language constructs and conversions of NFA and DFA.
3. Demonstrate the derivations and properties of various CFG and Regular grammars.
4. Design of PDA for the given CFG.
5. Appreciate the role of the Turing machine as computational and universal machine.

UNIT I:

Fundamental concepts: Strings, Alphabets, Language operations, Regular Expressions, Regular Languages: Finite automata, Types of finite automata (FA)-Non deterministic Finite Automata (NFA), Deterministic Finite Automata(DFA), NFA with ε-Moves, regular expression representation; Regular expressions to NFA; NFA with ε-Moves to NFA without ε-Moves; NFA to DFA Conversions; Minimization of DFA (Proofs Not Required)

UNIT II:

DFA with more than two outputs: Moore and Melay machines, Pumping Lemma for Regular Sets: Closure properties of Regular Sets (Proofs Not Required): Context Free Grammars (CFG), Right most, Left most –derivations, Parse Trees; Operator Grammar: Unit productions; Chomsky normal forms; (Proofs Not Required)

UNIT III

Left recursion and Elimination of left recursion in CFG: Elimination of useless symbols and unit productions; Greibach Normal Form, Push Down automata (PDA): Types of PDA: Design of a PDA for a given CFG. (Proofs Not Required)

UNIT IV:

Regular Grammars (RG), Design of DFA for a given RG: Right linear and left linear Grammars and conversions: Definition of Context Sensitive Grammar (CFG) and Linear bounded automata (LBA) (Proofs Not Required).

UNIT V:

Definition of unrestricted Grammar and Turing Machine (TM): Chomsky hierarchy on Languages, Grammars and recognizers; Design of TM as recognizer; Types of TM: Computational problems of TM with multiple tracks; Decidability Problem; Churches hypothesis (Proofs Not Required)

Text Book:

1. John E.Hopcroft, Rajeev Motwani, Jeffrey D.Ullman, Introduction to Automata Theory, Languages and Computation, Third Edition, Pearson, 2013.

Reference Books:

1. Daniel I.A.Cohen, Introduction to Computer Theory, Second Edition, John Wiley.
2. John C Martin, Introduction to languages and the theory of Computation, Third Edition, TATA McGraw Hill, 2014.
3. VivekKulakarni, Theory of Computation, Oxford University press 2013, Second Edition, 2014

ANURAG GROUP OF INSTITUTIONS
(AUTONOMOUS)

III Year B.Tech. IT - I Sem	L	T / P / D	C
	3	0	3

(A55041) WEB TECHNOLOGIES

Prerequisites: Java programming

Course Objectives:

1. Developing static web pages using HTML and CSS.
2. Data Validations using JavaScript.
3. To build XML applications with DTD and style sheets that span multiple domains.
4. Developing Dynamic pages.
5. Manipulating data in the database using JDBC.

Course Outcomes:

1. Design static web pages and provide client side authentication.
2. Prepare Static Web pages With Validations.
3. Develop new tag sets using XML mechanism.
4. Design and develop web applications using JSP and MVC architecture.
5. Understand database connectivity and retrieving data using client/server database.

Unit I:

INTRODUCTION TO WEB: Understanding Internet and Web, Web Architecture, Web servers, protocols: HTTP, Introduction HTML: History of HTML, WWW, HTML Basics: Elements, Attributes, Tags, Tables, Forms, Frames.div and span tags.

Unit II:

CSS: Introduction to cascading style sheet, Types of style sheets, page layout, selectors, pseudo classes and elements.
JAVA SCRIPT: Introduction to scripting, control structures, conditional statements, Arrays functions, objects.
HTML DOM: Predefined object (Window, Location, History, Navigator). Events, DOM Node methods, Navigation, creating nodes, adding nodes, inserting nodes, removing & Replaces Nodes, Form object and Elements, DHTML with Java Script.

Unit III:

XML: Basics of XML, Elements, Attributes, validation, Name space.
XML Scheme Languages: Introduction to DTD, internal and external DTD, Elements of DTD, DTD Limitations, XML Schema, Schema structure, Elements, parsing XML: XML DOM, Document node, element node, Text node, Java and DOM, Navigating DOM Tree.

Unit IV:

AJAX: Introduction, Environment, Asynchronous communication, process steps, sending and Retrieving Information, Ajax with XML.
Servlets : Introduction, Lifecycle, Generic and HTTP servlet, passing parameters to servlet, HTTP servlet Request & Response interfaces, Deploying web Applications, Session Tracking: Hidden form fields, cookies, URL- Rewriting, session.

Unit V:

JSP: Introduction, Difference Between servlets & JSP, Anatomy of JSP page, JSP elements: Directives, comments, Expressions, scriptlets, Declaration, Implicit JSP objects, using Action elements.
JDBC: Introduction, JDBC Drivers, Loading Driver, establishing connection, Executing SQL statement in JSP pages, MVC architecture.

Text Book:

1. Uttam K. Roy, Web Technologies, 8th Impression, Oxford Publication, 2014.

Reference Books:

1. Sebesta, Programming World Wide Web, 4th edition, Pearson, 2008.
2. Chris Bates, Web Programming, building internet applications, 2nd edition, WILEY Dreamtech, 2012.
3. Dietel and Nieto, Internet and World Wide Web – How to program, 3rd edition, PHI/Pearson Education Asia, 2012.
4. Marty Hall and Larry Brown, Core Servlets and Java Server Pages Volume 1: Core Technologies, 2nd edition, Pearson 2012.

ANURAG GROUP OF INSTITUTIONS
(AUTONOMOUS)

III Year B.Tech. IT - I Sem	L	T / P / D	C
	4	0	4

(A55048) COMPUTER NETWORKS

Prerequisites: Data structures and any programming language.

Course Objectives:

1. Compare OSI & TCP/IP models
2. Understand error detection, correction codes and framing methods.
3. Explain MAC and types of Ethernet
4. Discuss the concepts of LANs and Virtual Networks
5. Outline the concepts of logical addressing.

Course Outcomes:

1. Analyze TCP/IP and OSI models and various protocols.
2. Identify suitable multiple access protocol for different networks.
3. Analyze various error handling mechanisms.
4. Use of various devices in connecting different types of LANs
5. Compare and contrast ipv4 and ipv6.

Unit I:

Network Models-Layered Tasks, OSI model, Layers in the OSI model, TCP/IP protocol Suite, Addressing

Unit II:

Data Link Layer: Error **Detection and Correction**-Introduction, Block coding, Cyclic Codes, Check sum. **Data Link Control** –Framing, Flow and Error Control ,Protocols, Noiseless Channels, Noisy Channels, HDLC.

Unit III:

Medium Access Control: Multiple Access -Random Access, Controlled Access, Channelization. **Wired LANs**- IEEE Standards, Standard Ethernet, Changes in standard, FastEthernet, Gigabit Ethernet.

Unit IV:

Connecting LANs, Backbone Networks and Virtual LANs: Connecting Devices, Backbone Networks, Virtual LANs.

Unit V:

Network Layer: **Logical Addressing**- IPV4 addresses, IPV6 addresses. **Internet Protocol**- Internetworking, IPv4, IPv6, Transition from IPv4 to IPv6

Text Book:

1. Behrouz A Forouzan ,"Data Communications and Networking",4th Edition, McGraw-Hill.

Reference Books:

1. Andrew S. Tanenbaum, Computer Networks, Third Edition.
2. William Stallings, Data Communications, Eight Editions. Pearson Publishers.

ANURAG GROUP OF INSTITUTIONS
(AUTONOMOUS)

III Year B.Tech. IT - I Sem	L	T / P / D	C
	4	0	4

(A55042) OPERATING SYSTEMS

Prerequisites: Computer organization

Course Objectives

1. Understand operating system concepts
2. Analyze process scheduling and synchronization concepts.
3. Identify deadlock mechanisms
4. Understand memory management approaches.
5. Identify storage management and protection.

Course Outcomes:

1. Summarize operating system and process management concepts
2. Apply process scheduling and synchronization related issues.
3. Understand Deadlock prevention, avoidance, detection, recovery mechanisms.
4. Analyze effectively memory management concepts
5. Illustrate various protection and security measures.

Unit I:

Operating Systems Overview and Process Management -Introduction-What operating system do, Operating system structure (uni-programmed and multi programmed), Operating system operations, Operating system services, System calls, Types of System calls, Operating system structure.

Process Management- Process concepts, Process scheduling, Operations on processes, Inter process communication.

Unit II:

Process Scheduling and Synchronization-Multithreaded programming: Overview, Multithreading models.

Process Scheduling – Basic concepts, Scheduling criteria, Scheduling algorithms, Thread scheduling.

Process coordination: Synchronization – Background, The critical section problem, Peterson's solution, Synchronization hardware, Semaphore, Classical problems of synchronization, Monitors.

Unit- III:

Deadlocks-System model, deadlock characterization, Methods for handling deadlocks, Deadlock prevention, Detection and avoidance, Recovery from deadlock.

Unit IV:

Memory Management-Swapping, Contiguous memory allocation, Paging, Segmentation. Virtual memory management - Demand paging, copy-on-write, page-replacement, Thrashing.

Unit –V:

File system, system protection and security-Storage management – File concept, Access methods, Directory and disk structure, File-system mounting.System protection- Goals of protection, principles of protection, Domain of protection, Access matrix.
System Security – Security problem, Program threats, System and Network threats.

Text Book:

1. Abraham Silberchatz, Peter B. Galvin, Greg Gagne, Operating System Concepts, 9th edition ,John Wiley, 2016.

Reference Books:

1. D.M. Dharmdhere, Operating Systems – A Concept based Approach, 2nd Edition. TMH, 2007.
2. Andrew S Tanenbaum, Modern Operating Systems, 3rd Edition, PHI, 2008.
3. Behrouz A. Forouzan,Richard F. Gilberg, Unix and shell programming, cengage Learning 2009.

ANURAG GROUP OF INSTITUTIONS
(AUTONOMOUS)

III Year B.Tech. IT - I Sem	L	T / P / D	C
	4	0	4

(A55043) OBJECT ORIENTED ANALYSIS AND DESIGN
(PE-I)

Prerequisites: Any programming language

Course Objectives:

1. Object oriented Analysis and Design using UML present the concepts and techniques necessary to effectively use system requirements to drive the development of a robust design model.
2. To acquire UML, a common language for talking about requirements, designs, and component interfaces. Model a real-world application by using a UML class diagram.
3. Showing how we apply the process of object oriented analysis and design to software development.
4. Pointing out the importance and function of each UML model to the process of object oriented analysis and design, and explaining the notation of various elements in these models.

Course Outcomes:

1. Recognize the concepts and principles of object oriented programming concepts.
2. Understand the purposes, major components and key mechanisms of Class and Object diagram.
3. Describe the basic resource management responsibilities of Interaction Diagram.
4. Knowledge on State-chart Diagram.
5. Applying the techniques for Component and Deployment Diagrams.

Unit I:

Introduction to UML: Importance of modeling, principles of modeling, object oriented Modeling, conceptual model of the UML, Architecture, Software Development Life Cycle.
Basic Structural Modeling: Classes, Relationships, common Mechanisms, and diagrams.

Unit II:

Advanced Structural Modeling: Advanced classes, advanced relationships, Interfaces, Types and Roles, Packages
Class & Object Diagrams: Terms, concepts, modeling techniques for Class & Object Diagrams. Design class diagram for Library information system.

Unit III:

Basic Behavioral Modeling-I: Interactions, Interaction diagrams.
Basic Behavioral Modeling-II: Use cases, Use case Diagrams, Activity Diagrams. Design Use cases, Use case diagrams, Interaction diagram and Activity diagram for library system.

Unit IV:

Advanced Behavioral Modeling: Events and signals, state machines, processes and Threads, time and space, state chart diagrams. Design State machine for different objects in library system

Unit V

Architectural Modeling: Component, Deployment, Component diagrams and Deployment diagrams. Design and document of library system.

Text Book:

1. Grady Booch, James Rumbaugh, Ivar Jacobson, The Unified Modeling Language User Guide, 7th Impression, Pearson Education, 2008.

Reference Books:

1. Hans-Erik Eriksson, Magnus Penker, Brian Lyons, David Fado, UML2 Toolkit, 2nd Edition, WILEY-Dreamtech India Pvt. Ltd., 2012.
2. Meilir Page-Jones, Fundamentals of Object Oriented Design in UML, Illustrated Edition, Pearson Education, 2000.
3. Pascal Roques, Modeling Software Systems Using UML2, 1st edition, WILEY-Dreamtech India Pvt. Ltd., 2011.
4. Atul Kahate, Object Oriented Analysis & Design, 1st Edition, The McGraw-Hill Companies, 2007.
5. Mark Priestley, Practical Object-Oriented Design with UML, 2nd Edition, TATA McGrawHill, 2005.

ANURAG GROUP OF INSTITUTIONS
(AUTONOMOUS)

III Year B.Tech. IT I - Sem	L	T/P/D	C
	4	0	4

(A55061) INFORMATION RETRIEVAL SYSTEM

(PE-I)

Prerequisites: Database management system

Course Objectives:

1. This course studies the basic principles and practical algorithms used for information retrieval and text mining
2. To understand the functions of Information retrieval
3. To provide exploration of information retrieval systems' evaluation tools
4. To provide hands-on experience in evaluating search engines to solve computational search problems.
5. To understand the complexity of Information Retrieval Systems**.**

Course Outcomes:

1. Acquire the knowledge of information retrieval system and its capabilities
2. Comprehend the knowledge of indexing and Data structure that can used for storing the data
3. Know the concept of indexing and clustering of the information
4. Understand the searching techniques and visualization
5. Have a handle on algorithms for text searching and multimedia retrieval

Unit 1:

Introduction to Information Retrieval Systems: Definition, Objectives, functional overview, Relation to Database Management system.
IRS capabilities: Search capabilities, Browse Capabilities, Miscellaneous Capabilities

Unit II:

Cataloging and Indexing: History of objectives of Indexing, indexing process, automatic indexing
Data Structure: Introduction to Data structure, Stemming Algorithms, Invert file system, N-Gram Data structure, PAT data structure, Hypertext and XML data structure

Unit III:

Automatic Indexing: Classes of Automatic indexing, Statistical indexing, Natural language, concept Indexing, Hypertext Linkage.
Document and Term Clustering: Introduction to clustering, Thesaurus Generation, Manual clustering, Automatic term clustering

Unit IV:

User Search Techniques: Searching statement and binding, Similarity Measurement and Ranking, Relevance Feedback, Selective dissemination of information search, weighted searches of Boolean system.
Information Visualization: introduction to information visualization, Cognition and perception

Unit V:

Text Search Algorithms:Introduction to Text search techniques, Software text search algorithms, hardware text search system
Multimedia information retrieval: Spoken language audio retrieval, Non- speech audio retrieval, Graph Retrieval, Imagery retrieval, video retrieval

Text Book:

1. Gerald J.Kowalski, Mark T. Maybury, Information storage and retrieval systems, Theory and Implementation, 2nd Edition, Springer publications, 2013.

Reference Books:

1. Christopher D. Manning and Prabhakar, Raghavan, Introduction to information Retrieval, Cambridge University Press, 2014.
2. Ricardo baeza-Yates, Modern information retrieval, Pearson Education, 2007.
3. Robert Korthage, Information storage and Retrieval, John wiley & sons, 2007.

ANURAG GROUP OF INSTITUTIONS
(AUTONOMOUS)

III Year B.Tech. IT I - Sem	L	T/P/D	C
	4	0	4

(A55044) HUMAN COMPUTER INTERACTION
(PE-I)

Prerequisites: Computer organization

Course Objectives:

1. Demonstrate an understanding of guidelines, principles, and theories influencing human computer interaction.
2. Recognize how a computer system may be modified to include human diversity.
3. Select an effective style for a specific application.
4. Design mock ups and carry out user and expert evaluation of interfaces

Course Outcomes

1. Identify and formulate characteristics and components of graphical user interface.
2. Analyze various design paradigms for human computer interaction.
3. Design & implement human computer interaction using various design techniques.
4. Support design rules to use HCI in the software process.

Unit I:

Introduction: Importance of user Interface – definition, importance of good design. Benefits of good design. A brief history of Screen design.
The graphical user interface – popularity of graphics, the concept of direct manipulation, graphical system, Characteristics, Web user – Interface popularity, characteristics- Principles of user interface.

Unit II :

Design process – Human interaction with computers, importance of human characteristics human consideration, Human interaction speeds, understanding business junctions.

Unit III:

Screen Designing : Design goals – Screen planning and purpose, organizing screen elements, ordering of screen data and content – screen navigation and flow – Visually pleasing composition – amount of information – focus and emphasis – presentation

information simply and meaningfully – information retrieval on web – statistical graphics – Technological consideration in interface design.

Unit IV:

Windows – New and Navigation schemes selection of window, selection of devices based and screen based controls.
Components – text and messages, Icons and increases – Multimedia, colors, uses problems, choosing colors.

Unit V :

Software tools – Specification methods, interface – Building Tools.
Interaction Devices – Keyboard and function keys – pointing devices – speech recognition digitization and generation – image and video displays – drivers.

Text Books:

1. Wilbert O Galitz, The essential guide to user interface design, 3rd Edition, Wiley DreamTech, 2007.
2. Ben Shneidermann, Designing the user interface, 3rd Edition, Pearson Education Asia, 2001.

Reference Books:

1. Alan Dix, Janet Fincay, GreGoryd, Abowd, Russell Bealg, Human – Computer Interaction, Pearson.
2. Rogers, Sharps , Interaction Design Prece, Wiley Dreamtech,

ANURAG GROUP OF INSTITUTIONS
(AUTONOMOUS)

III Year B.Tech. IT - I Sem	L	T / P / D	C
	4	0	4

(A55046) MOBILE COMPUTING
(PE- I)

Prerequisites: Any programming language and computer networks.

Course Objectives:

1. Introduction of an advanced element of learning in the field of wireless communication.
2. The students to the concepts of wireless devices and mobile computing.
3. To introduce wireless communication and networking principles, that support connectivity to cellular networks, wireless internet and sensor devices.
4. To understand the use of transaction and e-commerce principles over such devices to support mobile business concepts
5. To appreciate the social and ethical issues of mobile computing, including privacy.

Course Outcomes:

1. Understand the necessary knowledge of cellular Communication, infrastructure-less networks.
2. Describe the main characteristics of mobile IP and how it differs from IP
3. Analyze TCP, MAC protocols and their technical feasibility.
4. Implement the hardware components/architectures/databases/operating system of mobile networks
5. Describe current and emerging interests in wireless and mobile computing and current capabilities, limitations and potential of each.

Unit I:

Introduction to MC, Applications, limitations, and architecture. GSM : Mobile services, System architecture, Radio interface, Protocols, Localization and calling, Handover, Security, and New data services.(Wireless) Medium Access Control : Motivation for a specialized MAC (Hidden and exposed terminals, Near and far terminals), SDMA, FDMA, TDMA, CDMA.

Unit II:

Mobile Network Layer : Mobile IP (Goals, assumptions, entities and terminology, IP packet delivery, agent advertisement and discovery, registration, tunneling and encapsulation, optimizations), Dynamic Host Configuration Protocol (DHCP).

Unit III:

Mobile Transport Layer : Traditional TCP, Indirect TCP, Snooping TCP, Mobile TCP, Fast retransmit/fast ecovery, Transmission /time-out freezing, Selective retransmission, Transaction oriented TCP.

Unit IV:

Mobile Ad hoc Networks (MANETs):RoutingDistination sequence distance vector Dynamic source outingalternative metrics overview Adhoc routing protocols

Unit V:

Protocols and Tools : Wireless Application Protocol-WAP. (Introduction, protocol architecture, and reatment of protocols of all layers), Bluetooth User scenarios ,Architecture , security, link management) and J2ME.

Text Books:

1. Jochen Schiller, Mobile Communications , ,2nd edition, Addison-Wesley, 2004.
2. Asoke K Talukder, Mobile Computing , 2nd Edition, McGraw Education

References Books:

1. Reza Behravanfar, Mobile Computing Principles, Designing and Developing Mobile Applications with UML and XM, ISBN: 0521817331, Cambridge University Press, October 2004,
2. Adelstein, Frank, Gupta, Sandeep KS, Richard III, Golden , Schwiebert, Loren, Fundamentals of Mobile and Pervasive Computing, ISBN: 0071412379, McGraw-Hill Professional, 2005.
3. Hansmann, Merk, Nicklous, Stober, Principles of Mobile Computing, Springer, second edition, 2003.
4. MartynMallick, Mobile and Wireless Design Essentials, Wiley DreamTech, 2003.

ANURAG GROUP OF INSTITUTIONS
(AUTONOMOUS)

III Year B.Tech. IT - I Sem	L	T / P / D	C
	4	0	4

(A55047) PRINCIPLES OF PROGRAMMING LANGUAGES

(PE-I)

Prerequisites: Any programming language and data structures

Course Objectives:

1. To know the principles of modular and object oriented programming
2. To know the basic knowledge of grammars, compliers and interpreters
3. To know the basic fundamentals of logical and functional programming
4. To know the principles of scripting languages
5. To Know basic overview of concurrency

Course Outcomes:

1. They will be able to know the modular and object oriented programming
2. They will able to write complier programs
3. They will be to know logical and functional programming technique
4. They will able to develop concurrency programming

Unit I:

Preliminary Concepts: Reasons for studying, concepts of programming languages, Programming domains, Language Evaluation Criteria, influences on Language design, Language categories, Programming Paradigms – Imperative, Object Oriented, functional Programming , Logic Programming .Programming Language Implementation–Compilation and Virtual Machines, programming environments.

Syntax and Semantics: general Problem of describing Syntax and Semantics, formal methods of describing syntax - BNF, EBNF for common programming languages features, parse trees, ambiguous grammars, attribute grammars.

Unit II:

Data types: Introduction, primitive, character, user defined, array, associative, record, union, pointer and reference types, design and implementation uses related to these types .Names, Variable, concept of binding, type checking, strong typing, type compatibility, named constants, variable initialization.

Expressions and Statements: Arithmetic relational and Boolean expressions, Short circuit evaluation mixed mode assignment, Assignment Statements, Control Structures – Statement Level, Compound Statements, Selection, Iteration, Unconditional Statements.

Unit III:

Subprograms and Blocks: Fundamentals of sub-programs, Scope and lifetime of variable, static and dynamic scope, Design issues of subprograms and operations, local referencing environments, parameter passing methods, overloaded sub-programs, generic sub-programs, parameters that are sub-program names, design issues for functions user defined overloaded operators, co routines.

Abstract Data types: Abstractions and encapsulation, introductions to data abstraction, design issues, language examples, C++ parameterized ADT, object oriented programming in small talk,C++,Java,C#,Ada95

Unit IV:

Concurrency: Subprogram level concurrency, semaphores, monitors, massage passing, Java threads, C# threads.

Exception handling: Exceptions, exception Propagation, Exception handler in Ada, C++ and Java.

Unit V:

Logic Programming Language: Introduction and overview of logic programming, basic elements of prolog, application of logic programming.

Functional Programming Languages: Introduction, fundamentals of FPL, LISP, ML, Haskell, application of Functional Programming Languages and comparison of functional and imperative Languages

Text Book:

1. Robert .W. Sebesta ,Concepts of Programming Languages, 7th edition, Pearson Education.

Reference Books:

1. Louden, Programming Languages, Second Edition, Thomson.

2. Ghezzi, Programming languages , 3rd Edition, John Wiley.

3. Pratt and Zelkowitz ,Programming Languages Design and Implementation , 4th Edition PHI/Pearson Education.

ANURAG GROUP OF INSTITUTIONS
(AUTONOMOUS)

III Year B.Tech. IT - I Sem	L	T / P / D	C
	0	3	2

(A55216) ADVANCED ENGLISH COMMUNICATION SKILLS LAB

Prerequisites: Basic knowledge in English

1. Introduction

The introduction of the English Language Lab is considered essential at 3rd year level. At this stage the students need to prepare themselves for their careers which may require them to listen to, read, speak and write in English both for their professional and interpersonal communication in the globalised context.

The proposed course should be an integrated theory and lab course to enable students to use good English and perform the following:

- Gather ideas and information, to organize ideas relevantly and coherently.
- Engage in debates.
- Participate in group discussions.
- Face interviews.
- Write project/research reports/technical reports.
- Make oral presentations.
- Write formal letters.
- Transfer information from non-verbal to verbal texts and vice versa.
- To take part in social and professional communication.

2. Objectives:

This Lab focuses on using computer-aided multimedia instruction for language development to meet the following targets:

To improve the students‘ fluency in English, through a well-developed vocabulary and enable them to listen to English spoken at normal conversational speed by educated English speakers and respond appropriately in different socio-cultural and professional contexts.

Further, they would be required to communicate their ideas relevantly and coherently in writing.

3. Syllabus:

The following course content is prescribed for the Advanced Communication Skills Lab:

1. **Vocabulary Building** – synonyms and antonyms, Word Roots, One-Word Substitutes, Prefixes and Suffixes, Study of Word Origin, Analogy, Idioms and Phrases.
2. **Reading Comprehension –** Reading for Facts, Guessing meanings from context, Scanning, Skimming, Inferring Meaning, and Critical Reading.
3. **Writing Skills** –Structure and presentation of different types of writing - Resume Writing /E-Correspondence/Statement of Purpose.
4. **Technical Writing**- Technical Report Writing, Research Abilities/Data Collection/Organizing Data/Tools/Analysis.
5. **Group Discussion** – Dynamics of Group Discussion, Intervention, Summarizing, Modulation of Voice, Body Language, Relevance, Fluency and Coherence.
6. **Presentation Skills** – Oral presentations (individual and group) through JAM sessions/Seminars, Written Presentations through Projects/ PPTs/e-mails etc.
7. **Interview Skills** – Concept and Process, Pre-Interview Planning, Opening Strategies, Answering Strategies, Interview through Telephone and Video-Conferencing.

4. Minimum Requirement: The English Language Lab shall have two parts:

i) The Computer aided Language Lab for 60 students with 60 systems, one master console, LAN facility and English language software for self- study by learners.

ii) The Communication Skills Lab with movable chairs and audio-visual aids with a P.A System, a T. V., a digital stereo –audio & video system and camcorder etc.

System Requirement (Hardware component): Computer network with Lan with minimum 60 multimedia systems with the following specifications:

i) P – IV Processor
a) Speed – 2.8 GHZ
b) RAM – 512 MB Minimum
c) Hard Disk – 80 GB
ii) Headphones of High quality

5. Suggested Software:

The software consisting of the prescribed topics elaborated above should be procured and used.

Suggested Software:

- Clarity Pronunciation Power – part II □
- Oxford Advanced Learner's Compass, 7th Edition □
- DELTA's key to the Next Generation TOEFL Test: Advanced Skill Practice.
- Lingua TOEFL CBT Insider, by Dreamtech.
- TOEFL & GRE(KAPLAN, AARCO & BARRONS, USA, Cracking GRE by CLIFFS) □
- The following software from _train2success.com' □
  i. Preparing for being Interviewed,
  ii. Positive Thinking,
  iii. Interviewing Skills,
  iv. Telephone Skills,
  v. Time Management
  vi. Team Building,
  vii. Decision making
- English in Mind, Herbert Puchta and Jeff Stranks with Meredith Levy, Cambridge □

6. Books Recommended:

1. Technical Communication by Meenakshi Raman & Sangeeta Sharma, Oxford University Press 2009.
2. Advanced Communication Skills Laboratory Manual by Sudha Rani, D, Pearson Education 2011.
3. English Language Communication : A Reader cum Lab Manual Dr A Ramakrishna Rao, Dr G Natanam & Prof SA Sankaranarayanan, Anuradha Publications, Chennai 2008.
4. English Vocabulary in Use series, Cambridge University Press 2008.
5. Management Shapers Series by Universities Press(India)Pvt Ltd., Himayatnagar, Hyderabad 2008.
6. Communication Skills by Leena Sen, PHI Learning Pvt Ltd., New Delhi, 2009.
7. Handbook for Technical Writing by David A McMurrey & Joanne Buckely CENGAGE Learning 2008.
8. Job Hunting by Colm Downes, Cambridge University Press 2008.
9. Master Public Speaking by Anne Nicholls, JAICO Publishing House, 2006.
10. English for Technical Communication for Engineering Students, Aysha Vish hwamohan, Tata Mc Graw-Hil 2009.
11. Books on TOEFL/GRE/GMAT/CAT/ IELTS by Barron's/DELTA/Cambridge University Press.
12. International English for Call Centres by Barry Tomalin and Suhashini Thomas, Macmillan Publishers, 2009.

ANURAG GROUP OF INSTITUTIONS
(AUTONOMOUS)

III Year B.Tech. IT - I Sem	L	T / P / D	C
	0	3	2

(A55217) WEB TECHNOLOGIES LAB

Prerequisites: Java programming language and a parallel course on web technologies

Course Objectives:

1. Developing static web pages using HTML and CSS.
2. Data Validations using JavaScript.
3. To build XML applications with DTD and style sheets that span multiple domains.
4. Manipulating data in the database using JDBC
5. Developing Dynamic pages using servlets, JSP.

Course Outcomes:

1. Design static web pages and provide client side authentication.
2. Develop new tag sets using XML mechanism.
3. Understand database connectivity and retrieving data using client/server database.
4. Design dynamic web pages and develop web applications using MVC architecture.

Week-1:

Design the following static web pages required for an online book store web site.

1) HOME PAGE:

2) LOGIN PAGE:

Week -2:

Design the student REGISTRATION PAGE:

Week- 3:

Apply internal and external CSS (Cascading Style Sheets) for week1&2 pages.

Week -4:

VALIDATION: Write JavaScript to validate the following fields of the above registration page.

Week -5:

Design the catalogue page

Week -6:

Write an XML file which will display the Book information which includes the following: Write a Document Type Definition (DTD) to validate the above XML file.

Week -7:

Install TOMCAT web server and APACHE. While installation assign port number 4040 to TOMCAT and 8080 to APACHE. Make sure that these ports are available i.e., no other process is using this port. Deploy above all pages in to tomcat web server.

Week -8:

Write a program to display the HELLO WORLD message using servlet.

Week - 9:

Communicate two servlets using doGET and doPOST methods.

Week -10:

Write a program to create cookies and retrieval using servlet.

Week -11:

Write a program to display the HELLO WORLD message using JSP

Week -12:

Convert all above static web pages into the JSP pages.

Week -13:

Using registration form. Authenticate the user when he submits the login form using the user name and password from the database

Week -14

Create tables in the database which contain the details of items (books in our case like Book name , Price, Quantity, Amount)) of each category. Modify your catalogue page (week 4)in such a way that you should connect to the database and extract data from the tables and display them in the catalogue page using JDBC.

Week -15

Implement week -10 in MVC architecture.

ANURAG GROUP OF INSTITUTIONS
(AUTONOMOUS)

III Year B.Tech. IT - I Sem	L	T / P / D	C
	0	3	2

(A55218) OPERATING SYSTEM AND COMPUTER NETWORKS LAB

Prerequisites: Any programming language and a parallel course on operating system and computer networks.

PART A

Course Objectives:

1. Analyze system calls that can offer operating system services
2. Demonstrate various operating system concepts
3. Understand and apply concepts towards new operating system design
4. Understand the concept of Dead lock and its avoidance
5. Developing page replacement algorithms

Course Outcomes:

1. Understand system calls behavior and implement that can offer operating system services
2. Implement operating system concepts
3. Implement the producer and consumer problem
4. Implement the dead lock avoidance using banker's algorithm
5. Develop the CPU scheduling applications

1. Write a programs using the following system calls of UNIX operating system: fork, exec, getpid, exit, wait, close, stat, opendir, readdir
2. Write a program to implement multithreading?
3. Give the list of processes, their CPU burst times and arrival times, display or print the Gantt chart for FCFS and SJF. For each of the scheduling policy compute and print the average waiting time and average turnaround time
4. Give the list of processes, their CPU burst times and arrival times, display or print the Gantt chart for Priority and Round Rabin. For each of the scheduling policy compute and print the average waiting time and average turnaround time.
5. Implement producer consumer problem using semaphore?
6. Write a program to implement Banker's algorithm for deadlock avoidance?
7. Write a program to implement page replacement algorithms (FCFS, Optimal, LRU)

PART B

Course Objective:

1. Understand data link layer framing methods.
2. Explain the various error handling mechanism.
3. Understand data link control protocols
4. Implement various protocols of Noisy and Noiseless Channels

Course Outcomes:

1. Implement different data link layer framing methods.
2. Analyze error control methods.
3. Implement different protocols of noiseless Channels.
4. Develop programs for protocols in noisy Channels

1. Implement the data link layer framing methods Bit stuffing, Character Stuffing.
2. Implement CRC 16 error control mechanism in data link layer
3. Implement minimum hamming Distance
4. Implement Stop and Wait protocol.
5. Implement Go-Back-N and Selective Repeat Request protocols.
6. Implement CSMA/CD Using C program.
7. Write a C program for CSMA/CA.

ANURAG GROUP OF INSTITUTIONS
(AUTONOMOUS)

III Year B.Tech. IT – I Sem	L	T / P / D	C
	2	0	0

(A55049) LOGICAL REASONING AND QUANTITATIVE APTITUDE – II

Prerequisites: Basic mathematics of 10 +2 (intermediate) standard

Course Outcomes:

1. Enhance the problem-solving ability of the students with focusing on basic concepts of arithmetic, algebra, geometry data analysis.
2. Demonstrate various principles involved in solving mathematical problems and thereby reducing the time taken for performing job functions.

UNIT I :

Data Sufficiency: Problems in which a question on any topic such as Coding – Decoding, Blood Relations, Directions, Arithmetical Reasoning , etc.

Puzzle Test: Classification Type Questions, Seating Arrangements Comparison Type Questions, Sequential Order of Things, Selection Based on given conditions, Family – Based Puzzles , Jumbled Problems.

UNIT II:

Assertions and Reason – Logical Venn Diagrams – Alpha Numeric Sequence Puzzle.

Cubes and Dice – Analytical Reasoning.

UNIT III :

Logical Deduction: Logic, Statement – Arguments, Statement – Assumptions, Statement – Conclusions, Deriving Conclusions from Passages.

Clocks & Calendar.

UNIT IV:

Simple Interest : Effect of change of P, R and T on Simple Interest – Compound Interest: Conversion Period, Difference between Compound Interest and Simple Interest – Time and Work – Time and Distance.

UNIT V:

Mensuration: Area of Plane Figures, Volume and Surface Area of solid figures.

Data Interpretation: Tabulation, Bar Graphs, Pie Charts, Line Graphs.

Text Books:

1. Verbal and Non Verbal Reasoning by R.S.Agarwal.
2. Quantitative Aptitude by R.S.Agarwal.
3. Quantitative Aptitude by Abhijit Guha.

ANURAG GROUP OF INSTITUTIONS
(AUTONOMOUS)

III Year B.Tech. IT - II Sem	L	T / P / D	C
	3	1	3

(A56043) COMPILER DESIGN

Prerequisites: Formal language and automata theory and data structures

Course Objectives:

1. To introduce the concepts of text processing.
2. To introduce major parsing methods.
3. To introduce the principal ideas in syntax directed definitions and translations and intermediate code generation for typical programming languages.
4. To introduce the technology of code optimization
5. To introduce different code generation algorithms.

Course Outcomes:

1. Analyze different phases of compiler and different translators.
2. Design top down parsers and bottom up parsers for the language constructs.
3. Understand the role of symbol table and design various data structures for symbol table.
4. Apply syntactic analysis and generate intermediate code for different programs.
5. Apply different optimization techniques and code generation.

Unit I:

Introduction to Compilers: Structure of Compiler-Phases of Compiler, Symbol Table Management, Grouping of Phases into Passes, Compiler Vs Interpreter.
Lexical Analysis: Role and need of Lexical Analyzer, Input Buffering, Regular expressions for identifiers, Signed numbers etc.., A Language for specifying Lexical Analyzer, Lexical phase errors.

Unit II:

Syntactic Specification: Context Free Grammars, Derivations and Parse Trees, Capabilities of Context Free Grammars, Syntactic Phase errors, Semantic errors.
Basic Parsing Techniques: Parsers, Shift-Reduce Parsing, Operator-Precedence parsing, Top-Down parsing, Predictive parsers.

Unit III:

Construction of efficient Parsers: LR Parsers, Canonical collection of LR(0) items, Constructing SLR parsing tables, Constructing LR parsing tables, Constructing LALR parsing tables, using Ambiguous grammar, Comparison of SLR,LALR and CALR parsers, Comparison of Top down and Bottom up parsers.

Unit IV:

Syntax Directed Translation: Syntax Directed Translation schemes, Intermediate codes, Postfix notation, Three Address code, Quadruples and triples.
Symbol table: Contents of Symbol table, Data Structures for symbol tables, representing scope information.

Unit V:

Code Optimization: Principal sources of optimization, Loop optimization, Copy Propagation, Dead code elimination, Redundant sub expression elimination.

Code Generation: Object programs, problems in Code generation, A Machine Model, A Simple Code generator, Register allocation and assignment, Peephole optimization.

Text Book:

1. Alfred V Aho, Jeffrey D Ullman, Principles of Compiler Design, Pearson Education, 2001.

Reference Books:

1. J P Trembly and P G Sorenson, The Theory and practice of Compiler Writing, Mc Graw Hill, 2005.
2. Dick Grone, Henri E Bal, Ceriel J H Jacobs, Modern Compiler Design, Wiley Dreamtech, 2006.

ANURAG GROUP OF INSTITUTIONS
(AUTONOMOUS)

III Year B.Tech. IT - II Sem	L	T / P / D	C
	3	0	3

(A56044) DATA WAREHOUSING AND DATA MINING

Prerequisites: Database management system and any programming language

Course Objectives:

1. To familiarize the concepts and architectural types of data Warehouses.
2. Provides efficient design and management of data storages using data warehousing and OLAP.
3. To understand the fundamental processes concepts and techniques of data mining.
4. To consistently apply knowledge concerning current data mining research and how this may contribute to the effective design and implementation of data mining applications.
5. To provide advance research skills through the investigation of data-mining literature

Course Outcomes:

1. Design a data mart or data warehouse for any organization
2. Apply Association and classification knowledge to different data sets
3. Apply the clustering Techniques for different data sets
4. Explore recent trends in data mining such as web mining, spatial-temporal mining

Unit I:

Data Warehouse and OLAP Technology: what is a Data Warehouse, Multidimensional Data Model, OLAP Operations on Multidimensional Data, Data Warehouse Architecture

Cube computation: Multiway Array Aggregation, BUC

Unit II:

Introduction to Data Mining: Fundamentals of data mining, Data Mining Functionalities, Data Mining Task Primitives,Major issues in Data Mining.

Data Preprocessing: Needs for Preprocessing the Data, Data Cleaning, Data Integration and Transformation, Data Reduction

Unit III:

Mining Frequent Pattern: Associations and Correlations: Basic Concepts,Efficient and Scalable Frequent Item set Mining Methods, Mining various kinds of Association Rules,

Classification and Prediction: Issues Regarding Classification and Prediction, Classification by Decision Tree Induction, Bayesian Classification.

Unit IV:

Cluster Analysis: Types of Data in Cluster Analysis, A Categorization of Major Clustering Methods, Partitioning Methods-K-means, PAM, Hierarchical Methods-BIRCH, Density-Based Methods-DBSCAN, Outlier Detection

Unit V:

Pattern Discovery in real world data: Mining Time-Series Data, Spatial Data Mining, Multimedia Data Mining, Text Mining, Mining the World Wide Web, Data Mining Applications

Text Book:

1. Jiawei Han and Micheline Kamber, Data Mining Concepts and Techniques, Second Edition, Elsevier, 2007.

Reference Books :

1. Alex Berson and Stephen J. Smith, Data Warehousing, Data Mining & OLAP, Tata McGraw Hill, Tenth Reprint, 2007.

2. Arun K.Pujari , Data Mining Techniques,2nd Edition, Universities press.

ANURAG GROUP OF INSTITUTIONS
(AUTONOMOUS)

III Year B.Tech. IT - II Sem	L	T / P / D	C
	3	0	3

(A56067) INFORMATION SECURITY

Prerequisites: Computer networks and data structures

Course Objectives:

1. Analyze the importance of information Security in real world.
2. Compare and analyze different encryption Algorithms.
3. Summarize authentication functions using MAC and Hash.
4. Analyze security importance of various web applications.
5. Categorize various types of intruders and viruses

Course Outcomes:

1. Analyze the importance of information Security in real world.
2. Designing and analysis of different encryption Algorithms.
3. Implementation of MAC and Hash functions, security at different layers of a network.
4. Explore different types of intruders and viruses.

Unit I:

Information Security: Introduction, History of Information security, What is Security, CNSS Security Model, Components of Information System, Balancing Information Security and Access, Approaches to Information Security Implementation, The Security Systems Development Life Cycle.

Unit II:

Cryptography: Concepts and Techniques, symmetric and asymmetric key cryptography, steganography, Symmetric key Ciphers: DES structure, DES Analysis, Security of DES, variants of DES, Block cipher modes of operation , AES structure, Analysis of AES , Key distribution Asymmetric key Ciphers: Principles of public key cryptosystems, RSA algorithm, Analysis of RSA, Diffie-Hellman Key exchange.

Unit III:

Message Authentication and Hash Functions: Authentication requirements and functions, MAC and Hash Functions, MAC Algorithms: Secure Hash Algorithm, Whirlpool, HMAC, Digital signatures, X.509, Kerberos.

Unit IV:

Security at layers (Network, Transport, Application): IPSec, Secure Socket Layer(SSL), Transport Layer Security(TLS), Secure Electronic Transaction(SET), Pretty Good Privacy(PGP), S/MIME.

Unit V:

Intruders, Virus and Firewalls: Intruders, Intrusion detection, password management, Virus and related threats, Countermeasures, Firewall design principles, Types of firewalls.

Text Books:

1. Michael E. Whitman, Herbert J. Mattord, Principles of Information Security, 4th Edition, Cengage Learning.
2. William Stallings, Cryptography and Network Security, 4th Edition, Pearson Education.

Reference Books:

1. C K Shyamala, N Harini, Dr T R Padmanabhan, Cryptography and Network Security, 1st Edition, Wiley India.
2. Bernard Menezes, Network Security and Cryptography, CENGAGE Learning
3. AtulKahate, Cryptography and Network Security , 2nd Edition ,McGraw Hill,

ANURAG GROUP OF INSTITUTIONS
(AUTONOMOUS)

III Year B.Tech. IT - II Sem	L	T / P / D	C
	3	0	3

(A56046) ADVANCED COMPUTER NETWORKS

Prerequisites: Computer networks

Course Objectives:

1. Understand different Address Mapping Methods
2. Compare different routing protocols
3. Understand transport layer protocols
4. Discuss the concepts congestion control
5. Outline Application layer

Course Outcomes:

1. Analyze TCP/IP and OSI models and various protocols.
2. Analyze various network layer protocols.
3. Compare and contrast various Routing and Congestion control algorithms.
4. Choose suitable protocol (UDP/TCP) of transport layer based on the type of the application.
5. Evaluate various responsibilities of application layer.

Unit I:

Brief Introduction on Network Models, error detection and correction in data link layer.

Network Layer: **Address Mapping, Error Reporting and Multicasting**-Address Mapping, Internet Control Message Protocol (ICMP), Internet Group Management Protocol (IGMP), Internet Group Management Protocol Version6 (ICMPv6).

Unit II:

Network Layer: **Delivery, Forwarding and Routing**- Delivery, Forwarding, Uni-casting Routing Protocols, Multicast Routing Protocols

Unit III:

Transport Layer: Process to Process Delivery, User Datagram Protocols (UDP), Transmission control Protocol (TCP), Stream Control Transmission Protocol(SCTP).

Unit IV:

Transport Layer: **Congestion Control and Quality of Service**-Data Traffic, Congestion, Control, Quality of Service, Techniques to improve QoS, Integrated Services, and Differentiated services.

Unit V:

Application Layer: **Domain Name System**- Namespace, Domain Name Space, Distribution of Name Space, DNS in Internet, Resolution, Domain Name Space (DNS) Messages, Electronic Mail, File Transfer.

Text Book:

1. Behrouz A Forouzan, Data Communications and Networking, 5th Edition, McGraw-Hill, 2013.

Reference Books:

1. Andrew S. Tanenbaum , Computer Network, 5th Edition, Pearson Education India,2014.
2. William Stallings, Data Communications, 8th Edition, Pearson Education,2013.

ANURAG GROUP OF INSTITUTIONS
(AUTONOMOUS)

III Year B.Tech. IT II Sem	L	T / P/D	C
	3	0	3

(A56047) MACHINE LEARNING
(PE-II)

Prerequisites: Data structures and probability and statistics

Course Objectives:

1. To understand the concepts of machine learning
2. To understand supervised and unsupervised learning and their applications
3. To understand the theoretical and practical aspects of Probabilistic Graphical Models
4. To appreciate the concepts and algorithms of reinforcement learning
5. To learn aspects of computational learning theory

Course Outcomes:

1. To implement a Neural Network for an application of your choice using an available tool.
2. To implement probabilistic discriminative and generative algorithms for an application of your choice and analyze the results
3. To use a tool to implement typical clustering algorithms for different types of applications
4. To design and implement an HMM for a sequence model type of application
5. To identify applications suitable for different types of machine learning with suitable Justification

UNIT I:

INTRODUCTION: Machine Learning - Machine Learning Foundations –Overview – applications - Types of machine learning - basic concepts in machine learning Examples of Machine Learning -Applications - Linear Models for Regression-Linear Basis Function Models - The Bias-Variance Decomposition - Bayesian Linear Regression - Bayesian Model Comparison

UNIT II:

SUPERVISED LEARNING : Linear Models for Classification, Linear Models for Classification - Discriminant Functions -Probabilistic Generative Models - Probabilistic Discriminative Models - Bayesian Logistic Regression. Decision Trees - Classification Trees-

Regression Trees - Pruning. Neural Networks -Feed-forward Network Functions - Error Back propagation ,Radial Basis Function Networks.

UNIT III :

UNSUPERVISED LEARNING: Clustering- K-means - EM - Mixtures of Gaussians - The EM Algorithm in General -Model selection for latent variable models - high-dimensional spaces -- The Curse of Dimensionality -Dimensionality Reduction - Factor analysis - Principal Component Analysis - Probabilistic PCA- Independent components analysis

UNIT IV:

PROBABILISTIC GRAPHICAL MODELS : Directed Graphical Models - Bayesian Networks - Exploiting Independence Properties - From Distributions to Graphs -Examples - Markov Random Fields - Inference in Graphical Models - Learning –Naive Bayes classifiers- Markov Models – Hidden Markov Models.

UNIT V:

ADVANCED LEARNING: Sampling – Basic sampling methods , Reinforcement Learning- K-Armed Bandit Elements - Model-Based Learning- Value Iteration- Policy Iteration. Temporal Difference Learning Exploration Strategies- Deterministic and Non-deterministic Rewards and Actions. Semi - Supervised Learning. Computational Learning Theory

Text Books:

1. Christopher Bishop, Pattern Recognition and Machine Learning, Springer, 2006
2. Tom Mitchell, Machine Learning, McGraw-Hill, 1997

Reference Books:

1. Kevin P. Murphy, Machine Learning: A Probabilistic Perspective, MIT Press, 2012
2. Ethem Alpaydin, Introduction to Machine Learning, Prentice Hall of India, 2005
3. Hastie, Tibshirani , Friedman, The Elements of Statistical Learning, 2nd Edition, Springer, 2008.
4. Stephen Marsland, Machine Learning –An Algorithmic Perspective, CRC Press, 2009

ANURAG GROUP OF INSTITUTIONS
(AUTONOMOUS)

III Year B.Tech. IT II Sem	L	T / P/D	C
	3	0	3

(A56048) INTERNET OF THINGS
(PE-II)

Prerequisites: Computer networks and operating systems

Course Objectives:

1. To understand the basics of Internet of Things
2. To get an idea of some of the application areas where Internet of Things can be applied
3. To understand the middleware for Internet of Things
4. To understand the concepts of Web of Things
5. To understand the concepts of Cloud of Things with emphasis on Mobile cloud computing

Course Outcomes:

1. Identify and design the new models for market strategic interaction
2. Design business intelligence and information security for WoB
3. Analyze various protocols for IoT
4. Design a middleware for IoT
5. Analyze and design different models for network dynamics

Unit I:

Introduction to Internet of Things (IoT) - Definition and characteristics of IoT, Physical Design of IoT, Logical Design of IoT, IoT Enabling Technologies, IoT Levels and Deployment Templates.

Unit II :

Domain Specific IoTs Introduction, Home Automation, cities, Environment, Energy, Retail, Logistics, Agriculture, Industry, Health and Lifestyle.

IoT and M2M Introduction to M2M, Difference between IoT and M2M, SDN and NFV to IoT. Basics of IoT System Management with NETCOZF, YANG NETCONF, YANG, SNMP NETOPEER

Unit III :

Developing Internet of Things: IoT Platform Design Methodology, Introduction, IoT Design Methodology, Case Study on the IoT System for Whether Monitoring, Motivation for using Python.

Unit IV :

IoT Systems –Logical Design using Python, Introduction, Installing Python, Python Data Types and Data Structures, Control Flow and Functions, Modules , Packages, File Handling, Date/Time Operations, Classes, Python packages of Internet of Things,JSON,XML,HTTP,Lib and URL lib, SMTP lib.

Unit V :

IoT Physical Device and Endpoints, What is an IoT Device, Exemplary Device: Raspberry P_i About Raspberry Board, Linux on Raspberry P_i ,Raspberry P_i Interfaces, Serial, SPI, I2C. Programming Raspberry $P_{i\ with}$ Python, Other IoT Devices.

Text Book:

1. ArshdeepBahga and Vijay Madisetti,Internet of Things A Hands -on approach,Universities Press, 2015.

Reference Books:

1. HonboZhou,The Internet of Things in the Cloud: A Middleware Perspective, CRC Press, 2012.
2. Dieter Uckelmann, Mark Harrison, Florian Michahelles, Architecting the Internet of Things, Springer – 2011
3. David Easley and Jon Kleinberg,Networks, Crowds, and Markets: Reasoning About a Highly Connected World, Cambridge University Press, 2010
4. Olivier Hersent, Omar Elloumi and David Boswarthick,The Internet of Things: Applications to the Smart Grid and Building Automation, Wiley, 2012

ANURAG GROUP OF INSTITUTIONS
(AUTONOMOUS)

III Year B.Tech. IT - II Sem	L	T/P/D	C
	3	0	3

(A56068) SOFT COMPUTING
(PE-II)

Prerequisites: Data structures and any programming language

Course Objectives:

1. To learn the key aspects of soft computing.
2. To know about the components and building block hypothesis of genetic algorithms.
3. To understand the features of neural networks and its applications
4. To study fuzzy logic components.
5. To gain insight onto Neuro Fuzzy modelling and control

Course Outcomes:

1. Acquire the knowledge soft computing and correlation with other computing techniques.
2. Comprehend the knowledge of artificial neural networks and its generations.
3. Know the concept of genetic algorithms and its applications.
4. Understand the Fuzzy logic structure and operations.
5. Have a handle on Neuro-fuzzy concepts.

UNIT I :

Introduction To Soft Computing And Neural Networks : Soft Computing Introduction , Hard computing Vs Soft computing, Artificial intelligence , Developments of ANNs, Neural computing Vs Conventional Computing, SWARM Intelligent system: Strengths and Weakness, Application.

UNIT II :

Artificial Neural Networks: First Generation: Introduction to neural networks, Classification of ANN: Architecture, learning/ Training, Training and Testing Modes, Active/ Transfer function, First-generation neural networks: McCulloch and Pitts Neuron model, Perceptron network.

Second Generation: Back propagation neural networks, Kohonen neural networks, Hopfield neural networks.

UNIT III :

Genetic Algorithms: Introduction, Procedures of GAs: Genetic representations, Selection, operators, Mutation, Natural inheritance operators. Working of GAs: Binary or Discrete, Real or Continuous, Genetic algorithms applications: TSP, EPDP, Optimization of weights in

ANNs, Applicability of Genetic algorithms: Parallel GA, Convergence proof of GA, evolutionary programming, Working of evolutionary programming.

UNIT IV :

Fuzzy Logic : Introduction to fuzzy logic, Human learining ability, imprecision and uncertainty, Undesirability, Probability theory Vs Possibility Theory, Classical sets and Fuzzy Sets , Fuzzy set Operations, Fuzzy Relations – Fuzzy composition, Structure of Fuzzy inference systems : Fuzzification, Fuzzy propositions, Connectives, Implication relations, Inference procedures and algorithms, De-fuzzification, Assessment of De-fuzzification methods, Fuzzy Controllers: Antecedent/consequent variables, IF/THEN rules and inference, Fuzzy decision making,

UNIT V :

Neuro-Fuzzy Modeling: Adaptive Neuro-Fuzzy Inference Systems – Coactive Neuro-Fuzzy Modeling – Classification and Regression Trees – Data Clustering Algorithms – Rule base Structure Identification –Neuro-Fuzzy Control.(Text 2)

Text Books:

1. N.P. Padhy, S.P.Simon, Soft Computing, OXFORD University press.
2. S.N.Sivanandam, Introduction to Genetic Algorithms, S.N.Deepa, Wiley, 2007.

Reference Books:

1. Mitchell Melanie, An Introduction to Genetic Algorithm, Prentice Hall, 1998.
2. James A. Freeman and David M. Skapura, Neural Networks Algorithms, Applications, and Programming Techniques, Pearson Edition, 2003.
3. S. N. Sivanandam, S. Sumathi and S. N. Deepa, Introduction to Fuzzy Logic using MATLAB, Springer, 2007.

ANURAG GROUP OF INSTITUTIONS
(AUTONOMOUS)

III Year B.Tech. IT - II Sem	L	T / P / D	C
	3	0	3

(A56069) SOFTWARE PROJECT MANAGEMENT
(PE-II)

Prerequisites: Software engineering

Course Objectives:

1. A basic knowledge of software project management principles
2. The ability to come up with a project schedule and assign resources
3. Choose an appropriate project development methodology (e.g. waterfall, spiral …)
4. Identify project risks, monitor and track project deadlines

Course Outcomes:

1. Apply the practice of project management in delivering of projects.
2. Evaluate the project against strategic, technical and economic criteria.
3. Identify effort estimation and activity plan of a project.
4. Categorize and prioritize actions for risk management.
5. Evaluate the characteristics of various team structures**.**

UNIT I:

Introduction to software project management: Introduction, importance of software project management, Categorization of software project, problems, setting of objectives, stakeholders, the business case, management control.
Stepwise: overview of project planning: Introduction, selection of projects, objectives infrastructure, products and activities, activity risks. Analysis of project characteristics, estimation of effort for each activity, allocation of resources, review/publicize plan/execute plan.

UNIT II:

Programme management and project evaluation: programme management, management of allocation of resources within a programme, strategic programme management, creating a programme management, aids to programme management, benefits, evaluation of individual project's, technical assessment, cost benefit analysis, evaluation techniques, cash flow forecasting.
Selection of an appropriate project approach: choosing technologies, technical plan content list, and dynamic system development method.

UNIT III:

Software effort estimation: applications and its problems, the basis of software estimation.
Activity Planning: objectives, plan, project schedules, projects and activities(sequencing and

scheduling),network planning models, formulating the network models, far ward and backward pass , identifying the critical path, activities.

UNIT IV:

Risk Management: framework (identification,assessment, planning, and management), evaluating risks to the schedule, applying the PERT techniques, monte carol simulation, and critical chain concepts.
Resource Allocation: Nature, identifying requirements, scheduling, creating critical paths, counting costs, publishing, cost schedule, scheduling sequence.

UNIT V:

Monitoring and control: creating framework, collecting data, visualizing progress, cost monitoring, earned value analysis, prioritizing monitoring, change control.
Managing contracts: ISO 12207 approach, supply process, types, stages, typical terms of a contract, contract management, acceptance.
Managing people and organizing teams: organizational behavior, selecting the right person, instruction and best methods, motivation, Oldham-Hackman job characteristics working in groups, becoming a team, decision making, leadership, organizational structures, dispersed and virtual teams, influence of culture, stress, health and safety.

Text Books:

1. Bob Hughes and Mike Cotterell, Software Project Management, 5th Edition, Tata McGraw-Hill, 2015.
2. Newtown Square A Guide To The Project Management Body Of Knowledge (PMBOK Guide)., Pa. : Project Management Institute, Inc., 2004. Print.

Reference Books:

1. Walker Royce, Software Project Management, Pearson Education, 2006.
2. Joel Henry, Software Project Management, Pearson Education, 2005.
3. Pankaj Jalote, Software Project Management in practice, Pearson Education, 2007.

ANURAG GROUP OF INSTITUTIONS
(AUTONOMOUS)

III Year B.Tech. IT –II Sem	L	T/P/D	C
	3	0	3

(A56051) UNIX PROGRAMMING

(PE– III)

Prerequisites: Operating systems.

Course Objectives:

1. To understand the Unix utilities and be able to work with Bourne again shell (bash).
2. To understand the file concepts, process, role of kernel in process management, signal generation and handling.
3. Introduction to inter process communication, semaphores and multithreading.

Course Outcomes:

1. Summarize various utilities and use of shell scripts in UNIX environment.
2. Describe and understand file system, process and signals in UNIX system.
3. Analyze and apply the concepts of inter process communication.
4. Explain thread structure and use of thread API's in multithreaded programming.
5. Analyze the importance of sockets in network programming.

Unit I:

Introduction to Unix:- Architecture of Unix, Features of Unix , Unix Commands – PATH, man, echo, printf, script, passwd, uname, who, date, stty, pwd, cd, mkdir, rmdir, ls, cp, mv, rm, cat, more, wc, lp, od, tar, gzip.

Unit II :

Unix Utilities:- Introduction to unix file system, vi editor, file handling utilities, security by file permissions, process utilities, disk utilities, networking commands, unlink, du, df, mount, umount, find, unmask, ulimit, ps, w, finger, arp, ftp, telnet, rlogin.Text processing utilities and backup utilities , detailed commands to be covered are tail, head , sort, nl, uniq, grep, egrep, fgrep, cut, paste, join, tee, pg, comm, cmp, diff, tr, awk, cpio

Unit III :

Working with the Bourne shell(bash): Introduction, shell responsibilities, pipes and input Redirection, output redirection, here documents, running a shell script, the shell as a programming language, shell meta characters, file name substitution, shell variables, command substitution, test command, control structures, arithmetic in shell, functions.

Filters: Filters and Pipes, Concatenating files, Display Beginning and End of files, Cut and Paste, Sorting, Translating Characters, Files with Duplicate Lines, Count characters, Words or Lines, Comparing Files

Unit IV:

Inter-process Communications: Introduction to IPC, Pipes, FIFOs, Introduction to three types of IPC-message queues, semaphores and shared memory. **Message Queues:** Kernel support for messages, Unix system V APIs for messages, client/server example. **Semaphores**: Kernel support for semaphores, Unix system V APIs for semaphores. **Shared Memory:** Kernel support for shared memory, Unix system V APIs for shared memory, semaphore and shared memory example.

Unit V:

Files: File Concept, Files System Structure, Inodes, File Attributes, File Types, Library functions, the standard I/O and formatted I/O in C, stream errors, kernel support for files, System calls, file descriptors. **Process:** Process concept, Kernel support for process, process attributes, process control-process creation, waiting for a process, process termination, zombie process, orphan process, Process APIs. **Signals:** Introduction to signals, Signal generation and handling, Kernel support for signals, Signal function, unreliable signals, reliable signals, kill, pause, abort, sleep functions.

Text books:

1. Sumitabha Das, Unix Concepts and Applications, 4th edition, TMH, 2006.
2. T.Chan, Unix System Programming using C++, PHI, 2012.

Reference Books:

1. N.Mathew, R.Stones,Wrox, Beginning Linux Programming, 4th edition, Wiley India Edition.
2. W.R.Stevens, Unix Network Programming, PHI, 2001.
3. Graham Glass, King Ables, Unix for programmers and users, 3rd Edition, Pearson Education, 2003.
4. B.A.Forouzan and R.F.Gilberg, Unix and Shell programming, Cengage Learning, 2009.
5. W.R.Stevens, Advanced Programming in the Unix environment, 2nd Edition, Pearson Education, 2001.

ANURAG GROUP OF INSTITUTIONS
(AUTONOMOUS)

III Year B.Tech. IT - II Sem	L	T / P / D	C
	3	0	3

(A56052) COMPUTER GRAPHICS
(PE-III)

Prerequisites: Any programming language, mathematics-1 and data structures

Course Objectives:

1. To exemplify the major computer graphics application areas.
2. To create computer models of 2D And 3D objects using mathematical knowledge and skills.
3. Understating the 2D and 3D transforms

Course Outcomes:

1. To discriminate the various structures of Computer Graphics system.
2. To analyze basic principles of implementing Computer Graphics primitives.
3. To compare and contrast between implementation of 2D and 3D Transformations.
4. To differentiate the techniques for representing 3D geometrical objects.
5. To analyze requirements and constraints for hidden surface removal and rendering methods.

Unit I:

Introduction: Computer-Aided design, Presentation graphics, Computer Art, Entertainment, Education and Training, Visualization, Image processing, Graphics user interfaces.
Graphics Systems: Video display devices, Raster scan systems, Random scan systems, Input devices, Hard-copy devices, Graphics software.

Unit II:

Basic Graphic algorithms: Overview, Scan converting lines, Scan converting Circles, Scan converting Ellipse, Filling polygons, Clipping lines (Cohen Sutherland & Liang Barsky), Clipping polygons (Sutherland Hodgeman).

Unit III:

Geometrical Transformations: 2D Transformation (Translation, Rotation, Scaling, Shearing & reflection), Homogeneous co-ordinates and matrix representation of 2D transformations, Composition of 2D transformations, the window-to-view port transformation.
3D Transformations: Matrix representation of 3D Transformations (Translation, Rotation, Scaling, Shearing & reflection.).

Unit IV:

Viewing in 3D: Projections, Specifying an arbitrary 3D view, Examples of 3D viewing
Curves and surfaces: Polygon meshes, Hermite curves, Bezier curves, Bezier surfaces, B-Spline surfaces.

Unit V:

Visible surface determination: classification of visible surface determination algorithms (Back -Face Detection, Depth-Buffer, Scan line), BSP- Tree Method and Octree Method.
Illumination and Shading: Illumination models (Ambient Light, Diffuse & Specular Reflection and Phong Model), Shading models for Polygons (Gouraud&Phong).

Text Books:

1. Donald Hearn and M. Pauline Baker, Computer Graphics C version, 2nd Edition, Pearson, 2011.

Reference Books:

1. Foley, Van Dam, Feiner, Hughes, Computer Graphics Principles and Practice in C, 2nd Edition, Pearson ,2013,.
2. D.F. Rogers, Procedural Elements for Computer Graphics, 2nd Edition.

ANURAG GROUP OF INSTITUTIONS
(AUTONOMOUS)

III Year B.Tech. IT II Sem	L	T/P/D	C
	3	0	3

(A56053) SOFTWARE TESTING

(PE-III)

Prerequisites: Software engineering

Course Objectives:

1. Understand fundamentals of Software testing.
2. To understand Path, Transaction, Dataflow & Domain testing Strategies.
3. To analyze node reduction algorithm.
4. To explore the logic & state testing strategies.
5. Acquire knowledge on various automated testing tools.

Course Outcomes:

1. Prioritize & categorize the bugs and take necessary measures.
2. Apply Path, Transaction, and Dataflow& Domain testing Strategies.
3. Identify Number of test cases by applying node reduction algorithm.
4. Apply logic & state testing strategies.
5. Understand various automated testing tools.

Unit – I

Introduction: Purpose of testing, Dichotomies, model for testing, consequences of bugs, taxonomy of bugs

Flow graphs and Path testing: Basics concepts of path testing, predicates, path predicates and achievable paths, path sensitizing, path instrumentation, application of path testing .

Unit – II

Transaction Flow Testing: Transaction flows, transaction flow testing techniques.

Dataflow testing:-Basics of dataflow testing, strategies in dataflow testing, application of dataflow testing.

Unit – III

Domain Testing:-domains and paths, Nice & ugly domains, domain testing, domains and interfaces testing.

Paths, Path products and Regular expressions: Path products & path expression, reduction procedure, applications, regular expressions & flow anomaly detection.

Unit – IV

Logic Based Testing: Overview, decision tables, path expressions, kv charts, specifications.

State, State Graphs and Transition testing: State graphs, good & bad state graphs, state testing.

Unit – V

Matrices and Application: Motivational overview, matrix of graph, relations, power of a matrix, node reduction algorithm. Study of different automated testing tools.

Text Books:

1. Boris Beizer, Software Testing techniques, Second edition, Dreamtech, 2014.
2. Dr.K.V.K.K.Prasad, Software Testing Tools, First edition, Dreamtech, 2007.

Reference Books:

1. Glenford Myers,et.el., The art of Software testing, 2nd edition, Wiley Dreamtech, 2004.
2. Brain Marrick, The craft of software testing 1st edition, Pearson Education, 2007.
3. N.Chauhan, Software Testing, 1st edition, Oxford University Press, 2010.

ANURAG GROUP OF INSTITUTIONS
(AUTONOMOUS)

III Year B.Tech. IT - II Sem	L	T / P / D	C
	0	3	2

(A56217) UNIX PROGRAMMING LAB
(PE-II LAB)

Prerequisites: Any programming language, operating systems and a parallel course on Unix programming.

Course Objectives:

1. To provide the foundation of Unix programming..
2. To understand the Unix utilities.
3. Be able to work with Bourne again shell (bash).
4. To provide exploration of file concepts.
5. To understand the process, role of kernel in process management, signal generation and handling.

Course Outcomes:

1. Will be able to describe and use the LINUX operating system.
2. Will be able to describe and use the fundamental LINUX system tools and utilities.
3. We will able to describe and write shell scripts in order to perform basic shell programming.
4. Will be able to describe and understand the LINUX file system.

1. Write a shell script that accepts a file name, starting and ending numbers as arguments and displays all the lines between the given line numbers.

2. Write a shell script that deletes all lines containing the specified word in one or more files supplied as arguments to it.
    a. To delete first character
    b. Deletes last second character in every line.
    c. First word and second word goes to second word and first word in every line.

3. Write a shell script that displays a list of all files in the current directory to which the user has read, write and execute permissions.

4. Write a shell script that receives any number of file names as arguments checks if every argument supplied is a file as its arguments, counts and reports the occurrence of each word that is present in the first argument file on other argument files.

5. Write a shell script that accepts a list of file names as its arguments, counts and reports the occurrence of each word that is present in the first argument file on other argument files.

6. Write a shell script to list all of the directory files in a directory.

7. Write a shell script to find factorial of a given number.

8. Implement in C the following Unix commands and System calls.
   a. cat b. ls c. mv.

   a. Implement in C the cat Unix command using system calls

   b. Implement in C the following ls Unix command using system calls

   c. Implement in C the Unix command mv using system calls

9. Write a C program to emulate the Unix ls – l command.

10. Write a C program that takes one or more file or directory names as command line input and reports the following information on the file.
    1. file type 2. number of links 3. read, write and execute permissions
    4. time of last access

11. Write a C program that redirects a standard output to a file. Ex: ls>f1.

12. Write a C program to create a child process and allow the parent to display "parent" and the child to display "child" on the screen.

13. Write a C program to create a zombie process.

14. Write a C program that illustrates how an orphan is created.

15. Write a C program that illustrates the following.
    a) Creating a message queue.
    b) Writing to a message queue.
    c) Reading from a message queue.

16. Write a C program that illustrates inter process communication using shared memory system calls.

17. Write a C program that implements a producer-consumer system with two processes.(using semaphores)

18. Write a C program that illustrates file locking using semaphores.

19. Write a C program that counts the number of blanks in a text file using standard I/O

20. Write a C program that illustrates communication between two unrelated processes using named pipe.

ANURAG GROUP OF INSTITUTIONS
(AUTONOMOUS)

III Year B.Tech. IT - II Sem	L	T / P / D	C
	0	3	2

(A56218) COMPUTER GRAPHICS LAB
(PE-II LAB)

Prerequisites: A parallel course on computer graphics

Course Objectives:

1. To learn the principles and commonly used paradigms and techniques of computer graphics. To provide students with a foundation in graphics applications programming.
2. To gain a proficiency with OpenGL, "a standard specification defining a cross-language, cross-platform API for writing applications that produce 2D and 3D computer graphics."
3. To develop a facility with the relevant mathematics of computer graphics and understand 3D visualization.
4. To understand, visualize and control the real time universe.
5. The massive data sets being produced by cheap sensors are useless unless they can be understood by people.

Course Outcome

1. Design algorithms for different geometric shapes line, circle, and ellipse.
2. To implement graphics primitives and demonstrate geometrical transformations.
3. To create interactive graphics applications using one or more graphics application programming interfaces.
4. Develop design drawings that demonstrate computer graphics and design skills.
5. Effectively and creatively solve a wide range of graphic design problems.

Week 1

Recursive subdivision of tetrahedron to form 3D Sierpinski gasket

Week 2

Implementation of Line Algorithm – DDA andBresenham Mid-Point Line.

Week 3

Implementation of Bresenham Mid-Point Circle Algorithm

Week 4

Implementation of Bresenham Mid-Point Ellipse Algorithm.

Week 5

Cohen Sutherland 2D line clipping Algorithm

Week 6

Liang-Barsky Line Clipping Algorithm with Window to viewport Mapping

Week 7

Sutherland – Hodgeman Polygon clipping Algorithm.

Week 8 & 9

2-D Geometric Transformations (Translation, Rotation, Scaling, Reflection, Shearing)

Week 10

2-D Composite Transformations

Week 11 & 12

3-D Transformations (Translation, Rotation, Scaling)

Week 13

3-D Composite Transformations

Week 14

Simple shaded scene consisting of a tea pot on a table

Week 15

Bezier Curves Drawing

Week 16

Review

ANURAG GROUP OF INSTITUTIONS
(AUTONOMOUS)

III Year B.Tech. IT II Sem	L	T/P/D	C
	0	3	2

(A56219) SOFTWARE TESTING LAB

(PE-II LAB)

Prerequisites: A parallel course on software testing

Course Objectives:

1. Demonstrate the working of software testing tools with c language.
2. Study of testing tools
3. Writing test cases for various applications.

Course Outcomes:

1. Find practical solutions to the problems
2. Solve specific problems alone or in teams
3. Manage a project from beginning to end
4. Work independently as well as in teams
5. Define, formulate and analyze a problem

1. Write Program in 'C' Language to demonstrate the working of the following constructs: DO…WHILE, WHILE, SWITCH, FOR, IF-ELSE.

2. "A Program written in 'C' language for Matrix Multiplication fails" Introspect the causes for its failure and write down the possible reasons for its failure.

3 .Take any system and study its system specifications and report the various bugs.

4. Write the test cases for any known application.

5 . Create a test plan document for any application.

6. Study of any web testing tool

7. Study of any bug tracking tool

8. Study of any test management tool

9. Study of any functionality testing tool.

ANURAG GROUP OF INSTITUTIONS
(AUTONOMOUS)

III Year B.Tech. IT - II Sem	L	T / P / D	C
	0	3	2

(A56220) DATA WAREHOUSING AND DATA MINING LAB

Prerequisites: Database management system and parallel course on data warehousing and data mining

Course Objectives:

1. To implement data warehouses for different organizations.
2. To analyze the process of preprocessing the data.
3. To test the real world data sets using supervised learning and unsupervised learning.
4. To determine the performance and accuracy of models.
5. To handle small data mining project for a given practical domain.

. **Course Outcomes:**

1. The data mining process and important issues around data cleaning, pre-processing and integration**.**
2. The principle algorithms and techniques used in data mining, such as clustering, association mining, classification and prediction

Week-1: Design multi-dimensional data models namely star, snowflake and Fact constellation schemas for one enterprise (Like banking).

Week-2-3: Apply below preprocessing techniques on given dataset.

Handling Missing Values , Remove records having a NULL value, Replace Numeric attributes by mean value, Remove Nominal attributes having null value, Sampling, Discretization (Binning) , Normalization

Week-4: Market basket analysis using Association Rule Mining

Week-5: Movie reviews classification using WEKA Tool

Week-6: Weather classification using WEKA Tool

Week-7: Multiple regression analysis on sales data set

Week-8: Demonstrate K-means based Clustering in weka

Week-9: Demonstrate hierarchical based Clustering in weka

Week-10: Apply classification, cluster technique on time series data sets

Week-11: Apply classification, cluster technique on time spatial data sets

Week-12: Demonstrate Outlier detection technique

Week-13-16: Credit Risk Assessment

Description: The business of banks is making loans. Assessing the credit worthiness of an applicant is of crucial importance. You have to develop a system to help a loan officer decide whether the credit of a customer is good, or bad. A bank's business rules regarding loans must consider two opposing factors. On the one hand, a bank wants to make as many loans as possible. Interest on these loans is the banks profit source. On the other hand, a bank cannot afford to make too many bad loans. Too many bad loans could lead to the collapse of the bank. The bank's loan policy must involve a compromise: not too strict, and not too lenient

ANURAG GROUP OF INSTITUTIONS
(AUTONOMOUS)

III Year B.Tech. IT –II Sem	L	T/P/D	C
	0	3	2

(A56221) PERSONALITY DEVELOPMENT AND CAREER BUILDING

Prerequisites: Basic english language

1. **Leadership**
    a. What makes a Leader
    b. Qualities of a Good Leader
    c. Leader with a purpose
    d. Selfless Leader
    e. Activities
    f. Practical Sessions
2. **Team Skills**
    a. Team Building
    b. Individual Skills
    c. Team Skills
    d. Subordinate Skills
    e. Leading Skills
    f. Practical Session
3. **Resume and Cover Letter, Writing about yourself**
    a. Resume Writing
    b. Cover Letter
    c. Practical Session
    d. Practical Session
    e. Practical Session
    f. Practical Session
4. **Group Discussion**
    a. What is GD
    b. Types of GD
    c. Group Dynamics
    d. How to take feedback
    e. Practice Session
5. **Interview Skills**
    a. Why Interviews – Corporate Outlook
    b. Tips for a Good Interview
    c. Interview Questions – Personal
    d. Interview Questions – Professional
    e. Common Interview Blunders
    f. Practical Sessions

Stress Management and Emotional Intelligence