VARDHAMAN COLLEGE OF ENGINEERING
(AUTONOMOUS)

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Shamshabad - 501 218, Hyderabad, Telangana State, India.
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BACHELOR OF TECHNOLOGY
INFORMATION TECHNOLOGY

SYLLABI (III Year and IV Year)

B. Tech. - Regular Four Year Degree Program
(For batches admitted from the Academic Year 2013 - 2014)
&
B. Tech. - Lateral Entry Scheme
(For batches admitted from the Academic Year 2014 - 2015)

SYLLABI FOR V SEMESTER

B. Tech. IT V SEMESTER

MICROPROCESSORS AND INTERFACING
(Common to CSE & IT)

Course Code: **A1423**

L	T	P	C
4	-	-	4

UNIT - I
INTRODUCTION: Architecture of 8086 microprocessor, Register organization, 8086 flag register and its functions, addressing modes of 8086, Pin diagram of 8086, Minimum mode system operation, Timing diagram.

UNIT - II
8086 FAMILY ASSEMBLY LANGUAGE PROGRAMMING: 8086 Instruction Set, Simple programs, Assembly language programs involving logical, branch and call instructions, sorting, evaluation of arithmetic expressions, string manipulation, assembler directives, procedures and macros.

UNIT - III
8086 MEMORY AND DIGITAL INTERFACING: 8086 addressing and address decoding, Interfacing RAM, ROM, EPROM to 8086, 8255 programmable Peripheral Interface, various modes of operation and interfacing to 8086, Interfacing keyboard, Interfacing to Alphanumeric Displays, seven segment LED displays, stepper motor, D/A and A/D converter interfacing.

UNIT - IV
INTERRUPTS AND PROGRAMMABLE INTERRUPT CONTROLLERS: 8086 Interrupts and Interrupt Responses introduction to DOS and BIOS interrupts. 8259A Priority Interrupt Controller, Software Interrupt Applications.

The 8086 Maximum Mode, Direct Memory Access (DMA) Data Transfer, Interfacing and Refreshing Dynamic RAMs, 8254 Software-Programmable Timer/Counter.

UNIT - V
SERIAL DATA TRANSFER SCHEMES: Asynchronous and synchronous data transfer schemes, 8251 USART architecture and interfacing, RS - 232C Serial data standard, RS - 423A and RS - 422A, sample program of serial data transfer.

ADVANCED MICROPROCESSORS: Introduction to 80286, salient features of 80386, real and protected mode segmentation and paging.

TEXT BOOKS:
1.   Douglas V. Hall (2007), *Microprocessors Interface*, 2nd edition, Tata McGraw Hill, New Delhi.

REFERENCE BOOKS:
1.   Walter A. Triebel, Avtar Singh (2003), *The 8088 and 8086 Microprocessors* 4th edition, Prentice Hall of India, New Delhi.
2.   Mazidi (2000), *The 8051 Microcontroller and Embedded System*, Prentice Hall of India, New Delhi.
3.   Deshmukh (2004), *Microcontrollers*, Tata McGraw Hill Edition, New Delhi.

B. Tech. IT V SEMESTER

THEORY OF COMPUTATION

Course Code: **A1510**

	L	T	P	C
	4	-	-	4

UNIT - I
FINITE AUTOMATA (FA): Introduction, model and behavior, Deterministic Finite Automata (DFA) -Formal definition, simpler notations (state transition diagram, transition table), language of a DFA. Nondeterministic Finite Automata (NFA)- definition of NFA, language of an NFA, Equivalence of Deterministic and Nondeterministic Finite Automata, Applications of Finite Automata, Finite Automata with Epsilon Transitions, Eliminating epsilon transitions, Minimization of Deterministic Finite Automata, finite automata with output (Moore and Mealy machines).

UNIT - II
REGULAR EXPRESSIONS (RE): Introduction, algebraic laws for Regular Expressions, Finite Automata and Regular Expressions- from DFA's to Regular Expressions, converting Regular Expressions to Automata, applications of Regular Expressions.

REGULAR GRAMMARS: Definition, regular grammars and FA, FA for regular grammar, regular grammar for FA. Proving languages to be non-regular -Pumping lemma, applications. Closure properties of regular languages.

UNIT - III
CONTEXT FREE GRAMMARS (CFG): Formal definition, sentential forms, leftmost and rightmost derivations, the language of a CFG. Derivation tree or parse tree, relationship between parse trees and derivations. Applications of Context Free Grammars, Ambiguous Grammar.

SIMPLIFICATION OF CFG: Removing useless symbols, Null (epsilon) - productions and unit productions. Normal forms: Chomsky Normal Form and Grieback Normal Form. Proving that some languages are not context free, Pumping lemma for Context Free Languages (CFL), applications. Some closure properties of CFLs, decision properties of CFLs, undecidable CFL problems.

UNIT - IV
PUSHDOWN AUTOMATA (PDA): Definition of the Pushdown Automata, the languages of PDA (acceptance by final state and empty stack), Equivalence of PDA's and CFG's, from Grammars to Pushdown Automata, Pushdown Automata to Grammars. Deterministic PDA(DPDA) -definition, DPDAs and regular languages, DPDAs and CFLs. Languages of DPDAs

UNIT - V
TURING MACHINES (TM): Formal definition and behavior, languages of a TM, TM as accepters, TM as a computer of integer functions, Types of TMs.

RECURSIVE AND RECURSIVELY ENUMERABLE LANGUAGES (REL): Some properties of recursive and recursively enumerable languages, universal Turing machine, the Halting problem, undecidable problems about TMs.

COMPUTABILITY THEORY: Context sensitive language and linear bounded automata (LBA), Chomsky hierarchy, the classes P and NP, post's correspondence problem (PCP), undecidability of PCP.

TEXT BOOKS:
1. John E. Hopcroft, Rajeev Motwani, Jeffrey D. Ullman (2007), *Introduction to Automata Theory Languages and Computation*, 3rd edition, Pearson Education, India.

REFERENCE BOOKS:
1. K. L. P Mishra, N. Chandrashekaran (2003), *Theory of Computer Science-Automata Languages and Computation*, 2nd edition, Prentice Hall of India, India.
2. John C. Martin (2003), *Introduction to Languages and the Theory of Computation*, 3rd edition, Tata McGraw Hill, New Delhi.
3. Daniel I. A. Cohen (2007), *Introduction to Computer Theory*, 2nd edition, John Wiley, New Delhi, India.

B. Tech. IT V SEMESTER

SOFTWARE ENGINEERING
(Common to CSE & IT)

Course Code: **A1513**

L	T	P	C
3	1	-	4

UNIT - I
INTRODUCTION TO SOFTWARE ENGINEEIRN: The Evolving nature of software engineering, Changing nature of software engineering, Software engineering Layers, The Software Processes, Software Myths.

PROCESS MODELS: A Generic Process Model, Waterfall Model, Incremental Process Models, Evolutionary Process Models, Spiral Model, the Unified Process, Personal and Team Process Models, the Capability Maturity Model Integration (CMMI).

UNIT - II
REQUIREMENTS ENGINEERING: Functional and Non-Functional Requirements, The Software requirements Document, Requirements Specification, requirements Engineering, Requirements Elicitation and Analysis, Requirement Validation, Requirement Management, System Modeling: Context Models, Interaction Models, Structural Models, Behavioral Model, Model-Driven Engineering.

DESIGN CONCEPTS: The Design Process, Design Concepts, The Design Models, Architectural Design: Software Architecture, Architectural Genres, Architectural Styles.

UNIT - III
DESIGN AND IMPLEMENTATION: The Object Oriented Design with UML, Design Patterns, Implementation Issues, Open Source Development. User Interface Design: The Golden Rules, User Interface Analysis and Design, Interface Analysis, Interface Design Steps, Design Evaluation.

SOFTWARE TESTING STRATEGIES: A Strategic approach to Software Testing, Strategic Issues, Test Strategies for Conventional Software, Validation Testing, System Testing, The Art of Debugging, White-Box Testing, Black Box Testing.

UNIT - IV
PRODUCT METRICS: A Frame Work for Product Metrics, Metrics for the Requiremets Model, Metrics for Design Model, Metrics for Source Code, Metrics for Testing.

PROCESS AND PROJECT METRICES: Metrics in the Process and Project Domains, Software Measurements, Metrics for Software Quality, Risk Management: Risk verses Proactive Risk Strategies, Software Risks, Risk Identification, Risk Projection, Risk Refinements, Risk Mitigation Monitoring and Management (RMMM), The RMMM Plan.

UNIT - V
QUALITY MANAGEMENT: Quality Concepts, Software Quality, Software Quality Dilemma, Achieving Software Quality, Review Techniques, Reviews: A Formal spectrum, Informal Reviews, Formal Technical Reviews,

SOFTWARE QUALITY ASSURANCE: Background Issues, Elements of Software Quality Assurance, Tasks, Goals and Metrics, Software Reliability, the ISO 9000 Quality Standards.

TEXT BOOKS:
1. Roger S. Pressman (2011), *Software Engineering, A Practitioner's approach,* 7th edition, McGraw Hill International Edition, New Delhi.
2. Sommerville (2001), *Software Engineering,* 9th edition, Pearson education, India.

REFERENCE BOOKS:
1. K. K. Agarval, Yogesh Singh (2007), *Software Engineering,* 3rd edition, New Age International Publishers, India.
2. Lames F. Peters, Witold Pedrycz(2000), *Software Engineering an Engineering approach,* John Wiely & Sons, New Delhi, India.
3. Shely Cashman Rosenblatt (2006), *Systems Analysis and Design*, 6th edition, Thomson Publications, India.

UNIX PROGRAMMING
(Common to CSE & IT)

Course Code: **A1514**

L	T	P	C
4	-	-	4

UNIT - I
INTRODUCTION TO UNIX AND UNIX UTILITIES: A brief history of UNIX, architecture of UNIX, features of UNIX, introduction to vi editor. General purpose utilities, file handling utilities, security by file permissions, process utilities, disk utilities, networking commands, detailed commands to be covered are passwd, tty, script, clear, date, cal, cp, mv, ln, rm, unlink, mkdir, rmdir, du, df, mount, umount, find, unmask, ulimit, ps, who, w, finger, arp, ftp, telnet, rlogin.

TEXT PROCESSING AND BACKUP UTILITIES: Text processing utilities and backup utilities , detailed commands to be covered are cat, tail, head , sort, nl, uniq, grep, egrep, fgrep, cut, paste, join, tee, pg, comm, cmp, diff, tr, awk, tar, cpio.

UNIT - II
WORKING WITH THE BOURNE AGAIN SHELL (BASH): Shell, shell responsibilities, types of shell, pipes and i/o redirection, shell as a programming language, shell syntax: variables, conditions, control structures, commands, command execution, here documents, and debugging scripts.

UNIX FILE STRUCTURE: Introduction to UNIX file system, inode (Index Node), file descriptors, system calls and device drivers, library functions. Low level file access: open, read, write, close, lseek, stat, fstat, lstat, ioctl, umask, dup and dup2. The Standard i/o library: fopen, fread, fwrite, fclose, fflush, fseek, fgetc, fputc, fgets. Formatted input and output: printf, fprintf, sprint, scanf, fscanf, and sscanf. File and directory maintenance: chmod, chown, unlink, link, symlink, mkdir, rmdir, chdir, getcwd, scanning directories: opendir, readdir, telldir, seekdir, closedir.

UNIT - III
PROCESS AND SIGNALS: Process, process identifiers, process structure: process table, viewing processes, system processes, process scheduling, starting new processes: waiting for a process, zombie processes, fork, vfork, exit, wait, waitpid, exec, signals functions, unreliable signals, interrupted system calls, kill, raise, alarm, pause, abort, system, sleep functions, signal sets.

DATA MANAGEMENT AND FILE LOCKING: Data Management: managing memory: malloc, free, realloc, calloc, file locking: creating lock files, locking regions, use of read and write with locking, competing locks, other lock commands, deadlocks.

UNIT - IV
INTER PROCESS COMMUNICATION: Pipe, process pipes, the pipe call, parent and child processes, named pipes: fifos, semaphores: semget, semop, semctl, message queues: msgget, msgsnd, msgrcv, msgctl, shared memory: shmget, shmat, shmdt, shmctl, ipc status commands.

UNIT - V
INTRODUCTION TO SOCKETS: Socket, socket connections - socket attributes, socket addresses, socket, connect, bind, listen, accept, socket communications.

TEXT BOOKS:
1. W. Richard. Stevens (2005), *Advanced Programming in the UNIX Environment*, 1st edition, Pearson Education, New Delhi, India.

REFERENCE BOOKS:
1. Sumitabha Das (2007), *Your Unix The Ultimate Guide,* Tata Mc graw Hill, New Delhi, India.
2. Neil Matthew, Richard Stones, *Beginning Linux Programming (2011)*, 4th Edition, Wrox, USA.
3. W. Richard Stevens, Bill Fenner, Andrew M. Rudoff, (2002) *UNIX Network Programming - The Sockets Networking API*, 3rd edition, Volume 1, PHI Learning Private Limited India, New Delhi.

COMPUTER NETWORKS
(Common to CSE & IT)

Course Code: **A1515**

L	T	P	C
3	1	-	4

UNIT - I

INTRODUCTION: Network applications, network hardware, network software, reference models: OSI, TCP/IP, Internet, Connection oriented network - X.25, frame relay.

THE PHYSICAL LAYER: Theoretical basis for communication, guided transmission media, wireless transmission, the public switched telephone networks, mobile telephone system.

UNIT - II

THE DATA LINK LAYER: Design issues, error detection and correction, elementary data link protocols, sliding window protocols, example data link protocols - HDLC, the data link layer in the internet.

THE MEDIUM ACCESS SUBLAYER: Channel allocations problem, multiple access protocols, Ethernet, Data Link Layer switching, Wirelwss LAN, Broadband Wireless, Bluetooth

UNIT - III

THE NETWORK LAYER: Network layer design issues, routing algorithms, Congestion control algorithms, Internetworking, the network layer in the internet (IPv4 and IPv6), Quality of Service.

UNIT – IV

THE TRANSPORT LAYER: Transport service, elements of transport protocol, Simple Transport Protocol, Internet transport layer protocols: UDP and TCP.

UNIT - V

THE APPLICATION LAYER: Domain name system, electronic mail, World Wide Web: architectural overview, dynamic web document and http.

APPLICATION LAYER PROTOCOLS: Simple Network Management Protocol, File Transfer Protocol, Simple Mail Transfer Protocol, Telnet.

TEXT BOOKS:
1.   A. S. Tanenbaum (2003), *Computer Networks*, 4th edition, Pearson Education/ PHI, New Delhi, India.

REFERENCE BOOKS:
1.   Behrouz A. Forouzan (2006), *Data communication and Networking*, 4th Edition, Mc Graw-Hill, India.
2.   Kurose, Ross (2010), *Computer Networking: A top down approach,* Pearson Education, India.

B. Tech. IT V SEMESTER

DESIGN AND ANALYSIS OF ALGORITHMS
(Common to CSE & IT)

Course Code: **A1517**

L	T	P	C
4	-	-	4

UNIT - I
INTRODUCTION: Algorithm, pseudo code for expressing algorithms, performance analysis-space complexity, time complexity, asymptotic notation- big (O) notation, omega notation, theta notation and little (o) notation, recurrences, probabilistic analysis, disjoint set operations, union and find algorithms.

DIVIDE AND CONQUER: General method, applications-analysis of binary search, quick sort, merge sort, strassen's matrix multiplication, finding the maxima and minima.

UNIT - II
GREEDY METHOD: General method, applications-job sequencing with dead lines, 0/1 knapsack problem, minimum cost spanning trees, single source shortest path problem, optimal storage on tapes.

GRAPHS (Algorithm and Analysis): Graphs-breadth first search and traversal, depth first search and traversal, spanning trees, connected components and biconnected components, articulation points.

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, string editing.

UNIT - IV
BACKTRACKING: General method, applications-n-queen problem, sum of subsets problem, graph colouring, 0/1 knapsack problem, 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, oracles and adversary arguments, lower bounds through reductions.

NP-HARD AND NP-COMPLETE PROBLEMS: Basic concepts, non-deterministic algorithms, NP-hard and NP-complete classes, cook's theorem.

TEXT BOOKS:
1.   Ellis Horowitz, Satraj Sahni, Rajasekharam(2007), *Fundamentals of Computer Algorithms*, 2nd edition, University Press, New Delhi.

REFERENCE BOOKS:
1.   R. C. T. Lee, S. S. Tseng, R.C. Chang and T. Tsai (2006), *Introduction to Design and Analysis of Algorithms A strategic approach*, McGraw Hill, India.
2.   Allen Weiss (2009), *Data structures and Algorithm Analysis in C++*, 2nd edition, Pearson education, New Delhi.
3.   Aho, Ullman, Hopcroft (2009), *Design and Analysis of algorithms*, 2nd edition, Pearson education, New Delhi.

B. Tech. IT V SEMESTER

MICROPROCESSORS AND INTERFACING LAB
(Common to CSE & IT)

Course Code: **A1427**

L	T	P	C
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LIST OF EXPERIMENTS:

- **MICROPROCESSOR 8086:**

1. Programs involving data Transfer Instructions
    a. Byte and word transfer in different addressing modes
    b. Block move Without overlapping
    c. Block move With overlapping
    d. Block interchanging

2. Programs involving arithmetic and logical operations like addition and subtraction of multi precision numbers
    a. Addition and Subtraction of Multi precision numbers
    b. Multiplication and division of signed and unsigned Hexadecimal numbers
    c. ASCII adjustment instructions
    d. Code Conversion
    e. Arithmetic program to find square ,cube ,LCM ,GCD and factorial

3. Programs involving bit manipulation instructions like checking
    a. If given data is positive or negative
    b. If given data is odd or even
    c. Logical ones and zeros in a given data
    d. 2 out of 5 code
    e. Bit wise palindrome
    f. Nibble wise palindrome

4. Programs involving Branch / Loop instructions like :
    a. Programs on arrays : addition/subtraction of N nos., finding largest/smallest no., ascending/descending order, etc.
    b. Near and Far Conditional and Unconditional jumps, Calls and Returns

5. Programs on String Manipulations like string transfer, string reversing, searching for a character in a string, palindrome etc.

6. Programs involving on Software Interrupts

7. Programs to use DOS interrupt INT 21H Function calls For:
    a. Reading a Character from Keyboard, Buffer Keyboard input
    b. Display of characters/String on console
    c. Creation of a new file, read/write from a file,
    d. Read system date, set system date, read system time, set system time

- **INTERFACING 8086:**

1. Experiments on interfacing 8086 with the following modules through 8255 PPI / 8257 DMA / 8259 PIC
    a. A/D and D/A converters
    b. Matrix keyboard interface
    c. Seven segment display interface
    d. Logical controller interface
    e. Stepper motor interface
    f. Traffic signals by interfacing traffic controller to 8086
    g. Real time Clock using PIT 8253/8254

2. Interfacing a printer to an 8086 Microcomputer kit

B. Tech. IT V SEMESTER

UNIX PROGRAMMING LAB
(Common to CSE & IT)

Course Code: **A1518**

L	T	P	C
-	-	3	2

LIST OF EXPERIMENTS:

1. Study and Practice on various commands like
    man, passwd, tty, script, clear, date, cal, cp, mv, ln, rm, unlink, mkdir, rmdir, du, df, mount, umount, find, unmask, ulimit, ps, who, w.

2. Study and Practice on various commands like
    cat, tail, head , sort, nl, uniq, grep, egrep,fgrep, cut, paste, join, tee, pg, comm, cmp, diff, tr, awk, tar, cpio.

3. a) Write a Shell Program to print all .txt files and .c files.
    b) Write a Shell program to move a set of files to a specified directory.
    c) Write a Shell program to display all the users who are currently logged in   after a specified time.
    d) Write a Shell Program to wish the user based on the login time.

4. a) Write a Shell program to pass a message to a group of members, individual member and all.
    b) Write a Shell program to count the number of words in a file.
    c) Write a Shell program to calculate the factorial of a given number.
    d) Write a Shell program to generate Fibonacci series.

5. a) Write a Shell program to print all prime numbers between 1 and n.
    b) Write a Shell program to count no of lines in a text file which starts with a specified letter   (Use grep command).

6. a) Simulate **cat** command.   b) Simulate **cp** command.

7. a) Simulate **head** command. b) Simulate **tail** command.

8. a) Simulate **mv** command.   b) Simulate **nl** command.

9. Write a program to handle the signals like **SIGINT, SIGQUIT, SIGFPE**.

10. Implement the following IPC forms
       a) **FIFO**   b) **PIPE**

11. Implement **message queue** form of IPC.

12. Implement **shared memory** form of IPC.

13. Write a Socket program to print system date and time (Using TCP/IP).

SYLLABI FOR VI SEMESTER

B. Tech. IT VI SEMESTER

EMBEDDED SYSTEMS
(Common to CSE & IT)

Course Code: **A1430**

L	T	P	C
4	-	-	4

UNIT - I
EMBEDDED COMPUTING: Introduction, complex systems and microprocessor, the embedded system design process, formalisms for system design, design examples.

UNIT - II
THE 8051 ARCHITECTURE: Introduction, 8051 micro controller hardware, input/output ports and circuits, external memory, counter and timers, serial data input/output, interrupts.

BASIC ASSEMBLY LANGUAGE PROGRAMMING CONCEPTS: The assembly language programming process, programming tools and techniques, programming the 8051. Data transfer and logical instructions, arithmetic operations, decimal arithmetic, jump and call instructions.

UNIT - III
INTRODUCTION TO REAL-TIME OPERATING SYSTEMS: Tasks and task states, tasks and data, semaphores, and shared data; message queues, mailboxes and pipes, timer functions, events, memory management, interrupt routines in an RTOS environment.

BASIC DESIGN USING A REAL-TIME OPERATING SYSTEM: Principles, semaphores and queues, hard real-time scheduling considerations, saving memory and power, an example RTOS like uC-OS (open source).

UNIT - IV
EMBEDDED SOFTWARE DEVELOPMENT TOOLS: Host and target machines, linker/locators for embedded software, getting embedded software into the target system

DEBUGGING TECHNIQUES: Testing on host machine, using laboratory tools, an example system.

UNIT - V
INTRODUCTION TO ADVANCED ARCHITECTURES: ARM and SHARC, processor and memory organization and instruction level parallelism; networked embedded systems: bus protocols, I^2C bus and CAN bus; internet-enabled systems, design example-elevator controller.

TEXT BOOKS:
1. Wayne Wolf (2008), *Computers as Components-principles of embedded computer system design*, Elseveir, New Delhi, India.
2. Kenneth J. Ayala (2008), *The 8051 Microcontroller*, 3rd edition, Cengage Learning, India.
3. David E. Simon (1999), *An Embedded Software Primer*, Pearson Education, India.

REFERENCE BOOKS:
1. Jean J. Labrosse (2000), Embedding System Building Blocks, 2nd edition, CMP publishers, USA.
2. Raj Kamal (2004), *Embedded Systems*, Tata McGraw hill, India.
3. Ajay V. Deshmukh (2005), *Micro Controllers*, Tata McGraw hill, India.
4. Frank Vahid, Tony Givargis (2002), *Embedded System Design*, John Wiley, India.

LANGUAGE PROCESSORS
(Common to CSE & IT)

Course Code: **A1519**

L	T	P	C
4	-	-	4

UNIT - I
INTRODUCTION TO COMPILERS: Definition of compiler, interpreter and its differences, the phases of a compiler, role of lexical analyzer, regular expressions, finite automata, from regular expressions to finite automata, pass and phases of translation, bootstrapping, LEX-lexical analyzer generator.

PARSING: Parsing, role of parser, context free grammar, derivations, parse trees, ambiguity, elimination of left recursion, left factoring, eliminating ambiguity from dangling-else grammar, classes of parsing, top down parsing - backtracking, recursive descent parsing, predictive parsers, LL(1) grammars.

UNIT - II
BOTTOM UP PARSING: Definition of bottom up parsing, handles, handle pruning, stack implementation of shift-reduce parsing, conflicts during shift-reduce parsing, LR grammars, LR parsers-simple LR, canonical LR(CLR) and Look Ahead LR (LALR) parsers, error recovery in parsing, parsing ambiguous grammars, YACC-automatic parser generator.

UNIT - III
SYNTAX DIRECTED TRANSLATION: Syntax directed definition, construction of syntax trees, S-attributed and L-attributed definitions, translation schemes, emitting a translation.

INTERMEDIATE CODE GENERATION: intermediate forms of source programs– abstract syntax tree, polish notation and three address code, types of three address statements and its implementation, syntax directed translation into three-address code, translation of simple statements, boolean expressions and flow-of-control statements.

UNIT - IV
TYPE CHECKING: Definition of type checking, type expressions, type systems, static and dynamic checking of types, specification of a simple type checker, equivalence of type expressions, type conversions, overloading of functions and operators.

RUN TIME ENVIRONMENTS: Source language issues, Storage organization, storage-allocation strategies, access to non local names, parameter passing, symbol tables and language facilities for dynamic storage allocation.

UNIT - V
CODE OPTIMIZATION: Organization of code optimizer, basic blocks and flow graphs, optimization of basic blocks, the principal sources of optimization, the directed acyclic graph (DAG) representation of basic block, global data flow analysis.

CODE GENERATION: Machine dependent code generation, object code forms, the target machine, a simple code generator, register allocation and assignment, peephole optimization.

TEXT BOOKS:
1. Alfred V. Aho, Ravi Sethi, Jeffrey D. Ullman (2007), *Compilers Principles, Techniques and Tools*, 2nd edition, Pearson Education, New Delhi, India.

REFERENCE BOOKS:
1. Alfred V. Aho, Jeffrey D. Ullman (2001), *Principles of compiler design*, Indian student edition, Pearson Education, New Delhi, India.
2. Kenneth C. Louden(1997), *Compiler Construction– Principles and Practice*, 1st edition, PWS Publishing.
3. K. L. P Mishra, N. Chandrashekaran (2003), *Theory of computer science- Automata Languages and computation*, 2nd edition, Prentice Hall of India, New Delhi, India.
4. Andrew W. Appel (2004), *Modern Compiler Implementation C*, Cambridge University Press, UK.

B. Tech. IT VI SEMESTER

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OBJECT ORIENTED DESIGN AND PATTERNS
(Common to CSE & IT)
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Course Code: **A1520**   **L   T   P   C**
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UNIT - I
INTRODUCTION TO UML: Introduction to object oriented concepts like inheritance, Polymorphism, Information hiding, Importance of modeling, Principles of modeling, Object oriented modeling, An overview of UML, Conceptual model of the UML, Architecture, Software development life cycle.

BASIC STRUCTURAL MODELING: *Classes:* Terms and concepts, Common modeling techniques; *Relationships:* Modeling simple dependencies, Single inheritance and structural relationships; Common mechanisms and diagrams.

ADVANCED STRUCTURAL MODELING: Advance classes, Advance relationships, Interfaces, Types and Roles, Packages, Instances.

UNIT - II
THE OBJECT-ORIENTED DESIGN PROCESS: The object and class Concepts, Identifying classes, Identifying responsibilities, Relationships between Classes, Use Cases, CRC cards, UML class diagrams, Sequence diagrams, State diagrams, Using javadoc for design documentation, *Case Study:* A voice mail system.

UNIT - III
GUIDELINES FOR CLASS DESIGN: An overview of the date classes in the java library, designing a day class, the importance of encapsulation, analyzing the quality of an interface, programming by contract, unit testing.

INTERFACE TYPES AND POLYMORPHISM: The icon interface type, polymorphism, drawing shapes, the comparable interface type, the comparator interface type, anonymous classes, frames and user interface components, user interface actions, timers, designing an interface type.

UNIT - IV
PATTERNS AND GUI PROGRAMMING: Iterator, the pattern concept, the observer pattern, layout managers and the strategy pattern, components, containers and the composite pattern, scroll bars and the decorator pattern, how to recognize patterns, putting patterns to work.

INHERITANCE AND ABSTRACT CLASSES: The concept of inheritance, graphics programming with inheritance, abstract classes, the template method pattern, protected interfaces, the hierarchy of swing components, the hierarchy of standard geometric shapes, the hierarchy of exception classes, when not to use inheritance.

UNIT - V
FRAMEWORKS: Frameworks, applets as a simple framework, the collections framework, a graph editor framework, enhancing the graph editor framework.

MULTITHREADING: Thread basics, Thread synchronization, Animations.

MORE DESIGN PATTERNS: The adapter pattern, Actions and the command pattern, the factory method pattern, the proxy pattern, the singleton pattern, the visitor pattern, other design patterns.

TEXT BOOKS:
1.   Grady Booch, James Rumbaugh, Ivar Jacobson (2009), *The Unified Modeling Language User guide*, 2nd edition, Pearson Education, New Delhi, India.
2.   Cay Horstmann(2004), *Object-Oriented Design And Patterns*, Wiley India edition, New Delhi, India.

REFERENCE BOOKS:
1.   Meilir Page-Jones (2000), *Fundamentals of Object Oriented Design in UML*, Pearson Education, New York.
2.   Craig Larman(2005), *An introduction to Object –Oriented Analysis and Design and Unified Process Appling UML and Patterns*, 3rd edition, Pearson Education, New Delhi, India.
3.   John W. Satzinger, Robert B Jackson, Stephen D Burd(2004), *Object-Oriented Analysis and Design with the Unified Process*, Cengage learning, India.

B. Tech. IT VI SEMESTER

C# AND .NET FRAMEWORK
(Common to CSE & IT)

Course Code: **A1521**

L	T	P	C
3	1	-	4

UNIT - I

INTRODUCING C# AND THE .NET PLATFORM: The Philosophy of .NET, The .NET Solution, Building Blocks of the .NET platform(the CLR, CTS, and CLS), Additional .NET-Aware Programming Languages, An Overview of .NET Assemblies, Understanding the CTS, CLS, and CLR, The Assembly / namespace / Type Distinction, Exploring an Assembly Using ildasm.exe, Exploring an Assembly Using Reflector, The Platform-Independent Nature of .NET.

BUILDING C# APPLICATION: The Role of the .NET Framework 4.0 SDK, Building C# Applications Using csc.exe, Building .NET Applications Using Notepad++, Building .NET Applications Using SharpDevelop, Building .NET Applications Using Visual C# 2010 Express, Building .NET Applications Using Visual Studio 2010.

UNIT - II

CORE C# PROGRAMMING CONSTRUCTS PART - I: The Anatomy of Simple C# Program, Environment Class, The Syste.Console Class, System Data Types and C# Shorthand notation, Working with String data, Narrowing and Widening Data Type Local Variables, C# Iteration Constructs, Decision Constructs and the relational / Equality Operators.

CORE PROGRAMMING CONSTRUCTS PART-II: Methods and Parameter Modifiers, Understanding C# Arrays, Understanding the Enum Type, Understanding the Structure Type, Understanding Value Types and Reference Types, Understanding C# Nullable Type.

UNIT - III

UNDERSTANDING INHERITANCE AND POLYMORPHISM: The Basic Mechanics of Inheritance, revising Visual Studio Class Diagrams, Defining the Pillars of OOP, The First Pillar, The Second Pillar of OOP, The Third Pillar of OOP, Understanding Base Class / Derived Class Casting Rules, The Master Parent Class.

UNDERSTANDING STRUCTURED EXCEPTION HANDLING: ODE to Errors, Bugs, and Exceptions, The Role of .NET Exception Handling, The Simplest Possible Example, Configuring the State of an Exception, System-Level Exceptions, application-Level Exceptions, Processing Multiple Exceptions.

UNIT - IV

DELEGATES AND EVENTS: Understanding the .NET Delegate type, defining a Delegate Type in C#, The System.MulticastDelegate and System.Delegate Base Classes, The Simple Possible Delegate Example, Sending Object State Notification using Delegates.

PROGRAMMING WITH .NET ASSEMBLIES: Configuring .NET Assemblies, defining Custom Namespaces, The role of .NET Assemblies, Understanding the Format of a .NET assembly, Building and Consuming a Single-File Assembly, Building and Consuming a Multifile Assembly, Understanding Private Assembly, Understanding Shared Assembly, Consuming a Shared Assembly, Configuring Shared assemblies, Understanding Publisher Policy assemblies, Understanding the <codebase> Element, The System.Configuration Namespace.

UNIT - V

ADO.NET PART - I: The Connected Layer: A High-Level Definition of ADO.NET, Understanding ADO.NET Data Provider, Additional ADO.NET Namespaces, The Types of the System.Data.namespace, Abstracting Data Providers Using Interfaces, Creating the AutoLot Database, The ADO.NET data Provider Factory Model, Understanding the Connected Layer of Ado.NET, Working with Data Readers, Building a reusable Data Access Library, Creating a Console UI-Based Front End, Understanding Database Transactions.

ADO.NET PART - II: Disconnected Layer: Understanding the Disconnected Layer of ADO.NET, Understanding the Role of the Dataset, Working with DataColumns, Working with Datarows, Working with DataTables, Binding with Data Adapters, Adding Disconnected Functionality to AutoLotDAL.dll, Multitabled Dataset Objects and Data Relationships, the Windows Forms Database Code into a Class Library, Programming with LINQ to DataSet.

TEXT BOOKS:
1.	 Andrew Troelsen (2010), *Pro C# and the .NET 4 Platform*, 5th edition, Springer (India) Private Limited, New Delhi, India.

REFERENCE BOOKS:
1.	 E. Balagurusamy (2004), *Programming in C#,* 5th edition, Tata McGraw-Hill, New Delhi, India.
2.	 Herbert Schildt (2004), *The Complete Reference: C#,* Tata McGraw-Hill, New Delhi, India.
3.	 Simon Robinson, Christian Nagel, Karli Watson, Jay Gl (2006), *Professional C#*, 3rd edition, Wiley & Sons, India.

B. Tech. IT VI SEMESTER

<div align="center">

WIRELESS AND MOBILE COMPUTING

</div>

Course Code: **A1606**

L	T	P	C
3	1	-	4

UNIT - I

SATIELLITE SYSTEM: History, Applications, Routing, Localization, Handover.

WIRELESS LAN: Infrared vs. radio transmission, infrastructure and ad hoc networks, IEEE 802.11.

HIPER LAN: Protocol architecture, physical layer, channel access control sub-layer, MAC sub-layer, information bases and networking.

UNIT - II

MOBILE COMPUTING: Introduction, history, architecture, devices and applications, limitations.

GLOBAL SYSTEM FOR MOBILE COMMUNICATIONS (GSM): Mobile services, system architecture, radio interface, protocols, localization and calling, handover, security, and new data services.

MEDIUM ACCESS CONTROL: Motivation for a specialized MAC (Hidden and exposed terminals, near and far terminals), SDMA, FDMA, TDMA, CDMA.

UNIT - III

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).

MOBILE ADHOC NETWORKS (MANETS): Overview, properties of a MANET, spectrum of MANET applications, routing and various routing algorithms, security in MANETs.

MOBILE TRANSPORT LAYER: Traditional TCP, indirect TCP, snooping TCP, mobile TCP, fast retransmit/ fast recovery, transmission /time-out freezing, selective retransmission, transaction oriented TCP.

UNIT - IV

DATA DISSEMINATION: Push based mechanisms, pull based mechanisms, hybrid mechanisms, selective tuning (indexing) techniques.

DATABASE ISSUES: Hoarding techniques, caching invalidation mechanisms, client server computing with adaptation, power-aware and context-aware computing, transactional models, query processing, recovery, and quality of service issues.

UNIT - V

PROTOCOLS AND TOOLS: Wireless Application Protocol-WAP. (Introduction, protocol architecture, and treatment of protocols of all layers), Bluetooth (user scenarios, physical layer, MAC layer, networking, security, link management) and J2ME.

TEXT BOOKS:
1. Jochen Schiller (2004), *Mobile Communications*, 2nd edition, Low price edition, Pearson Education, New Delhi.
2. Rajkamal (2007), *Mobile Computing*, 2nd edition, Oxford University Press, USA.

REFERENCE BOOKS:
1. Stojmenovic, Cacute(2002), *Handbook of Wireless Networks and Mobile Computing,* John Wiley, New York.
2. Hansmann, Merk, Nicklous, Stober(2003), *Principles of Mobile Computing*, 2nd edition, Springer, New Delhi, India.

B. Tech. IT VI SEMESTER

HUMAN VALUES AND ETHICS
Interdepartmental Elective - I
(Common to CSE, IT & ECE)

Course Code: **A1016**

	L	T	P	C
	4	-	-	4

UNIT - I
HUMANVALUES: Morals, values and ethics, integrity, work ethic, service learning, civic virtue, respect for others, living peacefully, caring, sharing, honesty, courage, valuing time, co-operation, commitment, empathy, self-confidence, character and spirituality.

UNIT - II
ENGINEERING ETHICS: Senses of 'Engineering Ethics', variety of moral issued, types of inquiry, moral dilemmas, moral autonomy, Kohlberg's theory, Gilligan's theory, consensus and controversy, models of professional roles, theories about right action, self-interest, customs and religion, uses of ethical theories.

UNIT - III
ENGINEERING AS SOCIAL EXPERIMENTATION: Engineering as experimentation, engineers as responsible experimenters, codes of ethics, a balanced outlook on law, the challenger case study.

UNIT - IV
SAFETY, RESPONSIBILITIES AND RIGHTS: Safety and risk, assessment of safety and risk, risk benefit analysis and reducing risk, the Three Mile Island and Chernobyl case studies. Collegiality and loyalty, respect for authority, collective bargaining, confidentiality, conflicts of interest, occupational crime, professional rights, employee rights, Intellectual Property Rights (IPR), discrimination.

UNIT - V
GLOBAL ISSUES: Multinational corporations, environmental ethics, computer ethics, weapons development, engineers as managers-consulting engineers-engineers as expert witnesses and advisors -moral leadership-sample code of ethics like ASME, ASCE, IEEE, institution of engineers (India), Indian institute of materials management, institution of electronics and telecommunication engineers (IETE),India, etc.

TEXT BOOKS:
1. Mike Martin, Roland Schinzinger(1996), *Ethics in Engineering*, McGraw-Hill, New York.
2. Govindarajan M, Natarajan S, Senthil Kumar V. S (2004), *Engineering Ethics*, Prentice Hall of India, New Delhi, India.

REFERENCE BOOKS:
1. Charles D. Fleddermann(2004), *Engineering Ethics*, Pearson Education / Prentice Hall, New Jersey.
2. Charles E Harris, Michael S. Protchard, Michael J Rabins(2000), *Engineering Ethics - Concepts and Cases*, Wadsworth Thompson Learning, United States.
3. John R Boatright(2003), *Ethics and the Conduct of Business*, Pearson Education, New Delhi.
4. Edmund G Seebauer and Robert L Barry, (2001), *Fundamentals of Ethics for Scientists and Engineers,* Oxford University Press, New York.

B. Tech. IT VI SEMESTER

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HUMAN RESOURCE MANAGEMENT
Interdepartmental Elective - I
(Common to CSE, IT & ECE)

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Course Code: **A1017**   **L   T   P   C**
                                                             4   -   -   4

UNIT - I

INTRODUCTION HUMAN RESOURCE MANAGEMENT: Introduction and significance of HRM, Scope, functions of HRM, changing environment of HRM and Challenges. Human Resource Planning, Objectives, Factors influencing Human Resource planning, HR Planning Process.

UNIT - II

JOB ANALYSIS AND RECRUITMENT: Process and Sources of Recruitment; Selection, process of selection and techniques, Retention of Employees.

UNIT - III

HUMAN RESOURCES DEVELOPMENT: Training Vs Development, Need, Process of training, Methods of training, Training Evaluation, Career planning, Performance Management System, Methods of Appraisal, Common Errors.

UNIT - IV

COMPENSATION MANAGEMENT: Concepts and components of wages, Factors influencing wage fixation, Job evaluation, Methods of payment, Incentives and Fringe benefits.

UNIT - V

MANAGING INDUSTRIAL RELATIONS: Components of Industrial Relation, Trade Unions, functions of Trade Union, Employee Participation, Importance and Schemes, Collective Bargaining, Grievance Redressal, Industrial Dispute Settlement machinery.

TEXT BOOKS:
1.   Biswajeet Pattnayak (2009), *Human Resource Management*, Prentice hall of India, New Delhi, India.
2.   R. Wayne Mondy and Robert M. Noe (2009), *Human Resource Management*, Pearson, India.

REFERENCE BOOKS:
1.   Aswathappa. K. (2007), *Human Resources and Personnel Management*, Tata MC Graw Hill, New Delhi, India.
2.   Monappa. A, Saiyadain. M. (1979), *Personnel Management*, Tata Mc Graw Hill, New Delhi, India.
3.   C. B. Mamoria (2003), *Personnel Management*, Himalaya Publishing House, India.

ENTERPRENEURSHIP
Interdepartmental Elective - I
(Common to CSE, IT & ECE)

Course Code: **A1018**

L	T	P	C
4	-	-	4

UNIT - I
ENTREPRENEURSHIP: Importance and role of entrepreneurship, Characteristics of entrepreneurship, Qualities of an entrepreneur, Functions of entrepreneur; Theories of entrepreneurship, Stimulants of entrepreneurship and Barriers to entrepreneurship, Ethics and Social Responsibility, Role of entrepreneur in economic development.

UNIT - II
INSTITUTIONAL SUPPORT: Role of Government; Role of IDBI, SIDBI, SIDO, NIESBUD, SISI, DIC, Entrepreneurship Development Institute, MSMEs.

UNIT - III
WOMEN ENTREPRENEURSHIP: Role & Importance, Functions of women entrepreneur, Profile of Indian Women Entrepreneur, Problems of Women Entrepreneurs, Women Entrepreneurship Development in India and in Foreign Countries.

UNIT - IV
PROJECT MANAGEMENT: Concept of project and classification of project identification, project formulation - project report - project design, Project appraisal - profitability appraisal - project planning - social cost benefit analysis - financial analysis and project financing.

UNIT - V
TRAINING: Designing appropriate training programmes to inculcate Entrepreneurial Spirit, significance of entrepreneurial training, Training for New and Existing Entrepreneurs, Feedback and Performance of Trainees.

TEXT BOOKS:
1.   Robert Hisrich, Michael P. Peter, Dean A. Shepherd (2010), E*ntrepreneurship*, Tata Mc Graw Hill, New Delhi.

REFERENCE BOOKS:
1.   Bholanath Datta (2009), *Entrepreneurship*, Excel publications, India.
2.   David H Holt (2010), *Entrepreneurship*, Prentice hall of India, New Delhi, India.

B. Tech. IT VI SEMESTER

<div align="center">

BUSINESS COMMUNICATION
Interdepartmental Elective - I
(Common to CSE, IT & ECE)

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Course Code: **A1019**

L	T	P	C
4	-	-	4

UNIT - I

INTRODUCTION TO MANAGERIAL COMMUNICATION: Meaning, Importance and objectives, Principles of Communication, Forms of communication, Communication Process, Barriers To effective communication, Gateways to effective communication.

UNIT - II

NONVERBAL COMMUNICATION: Body Language, Gestures, Postures, Facial Expressions, Dress Code. Listening and Speaking Skills, Probing questions, Observation, Business and Social etiquette.

UNIT - III

MANAGERIAL SPEECHES: Principles of Effective Speech & Presentations. Technical and Non-technical presentations. Speech of introduction, speech of thanks, occasional speech, theme speech, Use of audio visual aids.

UNIT - IV

INTERVIEW TECHNIQUES: Mastering the art of conducting and giving interviews, Placement interviews, discipline/technical interviews, appraisal interviews, exit Interviews. *Group communication*: Importance, Meetings, group discussions, Video conferencing.

UNIT - V

INTRODUCTION TO BUSINESS CORRESPONDENCE: *Business letters*: Enquiries, Circulars, Quotations, Orders, Acknowledgments, Executions, Complaints, Persuading letters, Sales letters, Job application letters, Bio-data, Covering Letter, Interview Letters, Letter of Reference, Memos, minutes, Circulars and Notices. *Reports:* Types of Business Reports - Format, Choice of vocabulary, Coherence, paragraph writing, organization reports by individual, Report by committee.

TEXT BOOKS:
1. Lesikar R. V, Flatley M. E (2005), *For Empowering the Internet Generation*, Tata McGraw Hill Publishing Company Ltd., New Delhi, India.
2. Ludlow. R, Panton. F (1998), *The Essence of Effective Communications*, Prentice Hall of India Pvt. Ltd., New Delhi, India.

REFERENCE BOOKS:
1. Adair .J (2003), *Effective Communication,* Pan Macmillan, London.
2. Pan Mcmillan Thill J. V, Bovee G. L (1993), *Excellence in Business Communication,* Tata McGraw Hill, New York.
3. Bowman J.P, Branchaw P. P (1987), *Business Communications: From Process to Product*, Dryden Press, Chicago.

B. Tech. IT VI SEMESTER

INTELLECTUAL PROPERTY AND PATENT RIGHTS
Interdepartmental Elective - I
(Common to CSE, IT & ECE)

Course Code: **A1020**

L	T	P	C
4	-	-	4

UNIT - I
INTRODUCTION TO INTELLECTUAL PROPERTY: Introduction, types of intellectual property, international organizations, agencies and treaties, importance of intellectual property rights.

UNIT - II
TRADE MARKS: Purpose and function of trademarks, acquisition of trade mark rights, protectable matter, selecting and evaluating trade mark' trade mark registration processes.

UNIT - III
LAW OF COPY RIGHTS : Fundamental of copy right law, originality of material, rights of reproduction, rights to perform the work publicly, copy right ownership issues, copy right regisffation, notice of copy right' international copy right law.

LAW OF PATENTS: Foundation of patent law, patent searching process' ownership rights and transfer.

UNIT - IV
TRADE SECRETS: Trade secrete law, determination of trade secrete status' liability for misappropriations of trade secrets, protection for submission, trade secrete litigation.

UNFAIR COMPETITION: Misappropriation right of publicity, false advertising.

UNIT - V
NEW DEVELOPMENT OF INTELLECTUAL PROPERTY: New developments in trade mark law; copy right law patent law, intellectual property audits'. International overview on intellectual property, international - trade mark law, copy right law, international patent law, and international development trade secrets law.

TEXT BOOKS:
1.   Deborah. E. Bouchoux (2009*), Intellectual property*, Cengage learning, India.
2.   Deborah. E. Bouchoux (2001), *Protecting your companies intellectual property*, AMACOM, USA.

REFERENCE BOOKS:
1.   Prabudda ganguli (2003), *Intellectual property right*, Tata McGraw Hill Publishing company ltd., India.
2.   Robert Hisrich, Michael P. Peter, Dean A. Shepherd (2010), *Entrepreneurship*, Tata Mc Graw Hill., India.

PROJECT PLANNING AND MANAGEMENT
Interdepartmental Elective - I
(Common to CSE, IT & ECE)

Course Code: **A1021**

L	T	P	C
4	-	-	4

UNIT - I
PERT AND CPM : Introduction, origin of PERT and CPM, planning, scheduling and controlling, bar charts, milestone charts, weaknesses in bar charts, PERT and CPM networks comparison, event, activity, rules for drawing networks, numbering the events (Fulkerson's law), dummy activities.

UNIT - II
CPM - PERT NETWORK ANALYSIS : Time estimate, expected time, earliest allowable occurrence time, latest allowable occurrence time, slack, project duration, probability of completion, start and finish time estimates, floats, project scheduling, critical and sub-critical path. Updating - process of updating, when to update.

UNIT - III
CPM COST MODEL & RESOURCES ALLOCATIONS, RESOURCE SCHEDULING : Cost analysis, direct and indirect costs, operation time, normal and crash times and costs, optimizing project cost, crash limit, free float limit, optimization. Resource smoothening, resource leveling.

UNIT - IV
MANAGEMENT: Scope of construction management, significance of construction management, concept of scientific management, psychology in management, a historical account of management philosophy, qualities of manager, the roles/functions performed by effective and competent managers, the manager - as a decision maker, as a motivator, as a communication-link, as a conflict resolver, as a well wisher of co-employees and the employer etc.

UNIT - V
ORGANIZATION: Types of organization, merits and demerits of different types of organization, authority, policy, recruitment process and training; development of personnel department; labor problems; labor legislation in India; 'workmen's compensation act of 1923 and minimum wages act of 1948', and subsequent amendments. Safety in construction.

TEXT BOOKS:
1.   Punmia, Khandelwal (2006), *Project planning and control with PERT and CPM*, 3rd edition, Laxmi Publications, New Delhi, India.

REFERENCE BOOKS:
1.   L. S. Srinath (1975), *PERT and CPM*, 2nd Edition, Afflicted East West Press Pvt. Ltd, New Delhi, India.
2.   U. K. Shrivastava (1999), Construction Planning and Management, Galgotia Publications Pvt. Ltd., New Delhi, India.

OBJECT ORIENTED DESIGN AND PATTERNS LAB
(Common to CSE & IT)

Course Code: **A1522**

L	T	P	C
-	-	3	2

I.   OBJECT ORIENTED ANALYSIS (UML) LAB EXPERIMENTS:

Case studies given below should be Modeled using Rational Rose tool in different views i.e Use case view, logical view, component view, Deployment view.

CASE STUDY 1: LIBRARY INFORMATION SYSTEM
Problem Statement:

A library lends books and magazines to members, who are registered in the system. Also it handles the purchase of new titles for the library. Popular titles are bought in multiple copies. A member can reserve a book or magazine that is not currently available in the library, so that when it is returned by the library that person is notified. The library can easily create, update and delete information about the titles, members, loans and reservations in the systems.

CASE STUDY 2: A POINT OF SALE (POS) SYSTEM
Problem Statement:

A POS System is a computerized application used to record sales and handle payments; it is typically used in a retail store. It includes hardware components such as a computer and bar code scanner, and software to run the system. It interfaces to various service applications, such as a third-party tax calculator and inventory control. These systems must be relatively fault tolerant; that is, even if remote services and temporarily unavailable they must still be of capturing sales and handling at least cash payments. A POS system must support multiple and varied client – side terminals and interfaces such as browser, PDA's, touch – screens.

CASE STUDY 3: AUTOMATED TELLER MACHINE (ATM)
Problem Statement:

Software is designed for supporting a computerized ATM banking network. All the process involved in the bank is computerized these days. All the accounts maintained in the bank and also the transactions effected, including ATM transactions are to be processed by the computers in the bank. An ATM accepts a relevant cash card, interacts with user, communicates with the central system to carry out the transaction, dispenses cash, and prints receipts. The system to be designed and implemented must include appropriate record keeping and security provisions. The system must handle concurrent access to the same account.

CASE STUDY 4: ONLINE TICKET RESERVATION FOR RAILWAYS
Problem Statement:

Computer play an integral part of the day in today's life. It makes the entire job easier and faster, every job is computerized so as the ticket reservation we can book over the online ticket reservation system. During the booking of the ticket reservation passenger has to select origin, date of journey, destination, class of train etc. The reservation counter keeps track of passenger's information. Thus the system will have all the details about the trains and facilities provided by them. There are various trains with the different level of convenience for the passengers. The whole database will be maintained by database administrator. There are varieties of trains where the passengers can select the train according to the convenience for their destination journey. The journey could be within the state or across the India. Each train has the three types of classes i.e. Sleeper class, First class and the AC compartment. Design the application for the above problem description.

CASE STUDY 5: RECRUITMENT PROCEDURE FOR SOFTWARE INDUSTRY
Problem Statement:

In the software industry the recruitment procedure is the basic thing that goes in the hand with the requirement as specified by the technical management team. HR first gives an advertisement in leading Newspapers, Journals, Weeklies and Websites. The job seekers can apply for it through by Post or by e-mail to the company.
The technical skill and the experience of the candidates are reviewed and the short listed candidates are called for the interview.
There may be different rounds for interview like the written test, technical interview, HR interview. After the successful completion of all rounds of interview, the selected candidates names are displayed. Mean while HR gives all the details about the salary, working hours, terms and conditions and the retirement benefit to the candidate.

CASE STUDY 6: DESIGN A STUDENT REGISTRATION SYSTEM

Problem Statement:

Each student has access to his or her course and grade information only and must be authenticated prior to viewing or updating the information. A course instructor will use the system to view the list of courses he or she is assigned for a given semester or has taught previously, view the list of students registered for the course(s) he or she is teaching and record final grades for each student in the course(s). TA assignments will also be viewable through this system. Instructors must also be authenticated prior to viewing or updating any information.

CASE STUDY 7: ONLINE AUCTION SALES

Problem Statement:

The online auction system is a design about a website where sellers collect and prepare a list of items they want to sell and place it on the website for visualizing. To accomplish this purpose the user has to access the site. Incase it's a new user he has to register. Purchaser's login and select items they want to buy and keep bidding for it. Interacting with the purchasers and sellers through messages does this. There is no need for customer to interact with the sellers because every time the purchasers bid, the details will be updated in the database. The purchaser making the highest bid for an item before the close of the auction is declared as the owner of the item. If the auctioneer or the purchaser doesn't want to bid for the product then there is fixed cutoff price mentioned for every product. He can pay that amount directly and own the product. The purchaser gets a confirmation of his purchase as an acknowledgement from the website. After the transition by going back to the main menu where he can view other items.

B.   DESIGN PATTERNS LAB EXPARIMENTS

1.   Write a program to define one to many dependency relationship between the objects so that one object changes its state, all its dependents are notified and updated automatically using MVC relations.
2.   Write a program to build the components of maze for computer game applications using creational patterns.
3.   Write a program to create online help system like chain which are request receiving objects and pass the request along the chain until an object handles the request using chain of responsibility mechanism.
4.   Write a program to make any subsystem easier within a compiler system by providing the unified Interface to a set of interfaces within compiler.
5.   Write a program to add additional properties and behaviors like borders and scroll bars respectively to any user interface component using the decorator design pattern.

C# AND .NET FRAMEWORK LAB
(Common to CSE & IT)

Course Code: **A1523**

L	T	P	C
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LIST OF EXPERIMENTS:

1. **Working with callbacks and delegates in C#:** Demonstrates the use of delegates, callbacks, and synchronous and asynchronous method invocation, including how Microsoft .NET Framework classes provide explicit asynchronous support using the BeginXXXX and EndXXXX naming conventions and how you can make use of this support in your own code.

2. **Code access security with C#:** Demonstrates the use of .NET Framework Code Access Security, in which code can have permissions independent of the person executing the code.

3. **Creating a COM+ component with C#:** Demonstrates how to create a COM+ component, that takes advantage of Transaction management service within COM+, then assign a strong name to the assembly, register the assembly in the Global Assembly Cache, and register the component with COM+.

4. **Creating a Windows Service with C#:** Demonstrates how to create a Microsoft Windows Service that uses a File System Watcher object to monitor a specific directory for changes in files.

5. **Read and Write Images to a SQL Server Database with C#:** Demonstrates how to upload images into SQL Server by using standard HTML upload methods and then insert each image as a byte array into SQL Server.

6. **Interacting with a Windows Service with C#:** Develop a sample application that launches a Windows Form to allow the user to interact and manipulate the IIS Admin service on the local machine. The application should work by placing an icon in the System Tray.

7. **Partitioning an Application into Multiple Assemblies with C#:** Understand why it can be beneficial to create separate modules for an application download, and then demonstrates how to do so with C#.

8. **Using System Printing in C# Applications:** Develop a sample application that shows how to print a formatted report from sample data stored in an XML file using the PrintDocument class in the System.Drawing.Printing namespace. Also illustrates the user selection of a destination printer and multiple print fonts.

9. **Using Reflection in C#:** Demonstrate how to gather information on various types included in any assembly by using the System.Reflection namespace and some main .NET base classes.

10. **Sending Mail with SmtpMail and C#:** Uses a simple Web form to demonstrate how to use the SmtpMail class in the .NET Framework.

11. **Perform String Manipulation with the String Builder and String Classes and C#:** Demonstrates some basic string manipulation using both the String Builder and String classes.

12. **Application Configuration Using Configuration Files and the Registry Using C#:** A sample application that demonstrates methods of storing application settings by making use of both the system registry and application configuration files. Implements a custom configuration section to show how you can tailor these files to the specific needs of a particular application.

13. **Using the System.Net.WebClient to Retrieve or Upload Data with C#:** Demonstrate how to create a Windows Form that can use HTTP to download and save a resource from a specified URI, upload a resource to a specified URI, or read and write data through a stream object.

14. **Web Services Security with C#:** Examines how to use IIS to perform user authentication so that no changes to the Web Service are required in order to provide superior security.

15. **Reading and Writing XML Documents with the XmlTextReader and XmlTextWriter Class and C#:** Demonstrate how to retrieve information from an existing XML document and how to create a new XML document.

SYLLABI FOR VII SEMESTER

SOFTWARE PROJECT MANAGEMENT
(Common to CSE & IT)

Course Code: **A1524**

L	T	P	C
4	-	-	4

UNIT - I
SOFTWARE EFFORTS ESTIMATION TECHNIQUES: The waterfall model, conventional software Management performance. Evolution of software economics -Software Economics, pragmatic software cost estimation.

IMPROVING SOFTWARE ECONOMICS: Reducing Software product size, improving software processes, improving team effectiveness, improving automation, Achieving required quality, peer inspections, the principles of conventional software Engineering, principles of modern software management, transitioning to an iterative process.

UNIT - II
LIFE CYCLE PHASES: Engineering and production stages, inception, Elaboration, construction, transition phases. Artifacts of the process - the artifact sets, Management artifacts, Engineering artifacts, programmatic artifacts.

MODEL BASED SOFTWARE ARCHITECTURES: A Management perspective and technical perspective. Workflows of the process - Software process workflows, Iteration workflows.

PROJECT ORGANIZATIONS AND RESPONSIBILITIES: Line of Business Organizations, Project Organizations, evolution of Organizations. Process automation - Automation Building blocks, The Project Environment.

UNIT - III
CHECKPOINTS OF THE PROCESS: Major mile stones, Minor Milestones, Periodic status assessments. Iterative process planning - Work breakdown structures, planning guidelines, cost and schedule estimating, Iteration planning process, Pragmatic planning.

UNIT - IV
PROJECT CONTROL AND PROCESS INSTRUMENTATION: The seven core Metrics, Management indicators, quality indicators, life cycle expectations, pragmatic Software Metrics, Metrics automation. Tailoring the process, process discriminants.

UNIT - V
NEXT GENERATION SOFTWARE ECONOMICS: Modern Project Profiles, Next generation Software economics, modern process transitions.

CASE STUDIES: The Command Center Processing and Display system- Replacement (CCPDS-R), Process Improvement and Mapping to the CMM.

TEXT BOOKS:
1.   Walker Royce (2005), *Software Project Management*, Pearson Education, India

REFERENCE BOOKS:
1.   Bob Hughes, Mike Cottrell (2006), *Software Project Management*, Tata McGraw-Hill Edition, India.
2.   Joel Henry (2003), *Software Project Management,* Pearson Education, India.

B. Tech. IT VII SEMESTER

SOFTWARE TESTING AND QUALITY ASSURANCE
(Common to CSE & IT)

Course Code: **A1525**

L	T	P	C
4	-	-	4

UNIT - I
INTRODUCTION AND THE TAXONOMY OF BUGS: Purpose of testing, some dichotomies, a model for testing, the consequences of bugs, taxonomy for bugs, some bug statistics.

FLOW GRAPHS AND PATH TESTING: Path testing basics, predicates, path predicates and achievable paths, path sensitizing, path instrumentation, implement and application of path testing.

UNIT - II
TRANSACTION FLOW TESTING AND DATA FLOW TESTING: Transaction flows, transaction flow testing techniques, dataflow testing basics, data flow testing strategies, application, tools and effectiveness.

DOMAIN TESTING: Domains and paths, nice and ugly domains, domain testing, domains and interfaces testing, domains and testability.

UNIT - III
PATHS, PATH PRODUCTS AND REGULAR EXPRESSIONS: Path products and path expressions, a reduction procedure, applications, regular expressions and flow anomaly detection.

LOGIC BASED TESTING: Motivational overview, decision tables, path expressions again, KV charts, specifications.

UNIT - IV
STATES, STATE GRAPHS AND TRANSITION TESTING: State graphs, good state graphs and bad, state testing, testability tips.

GRAPH MATRICES AND APPLICATIONS: Motivational overview, the matrix of a graph, relations, the powers of a matrix, node reduction algorithm, building tools.

UNIT - V
AN OVERVIEW OF SOFTWARE TESTING TOOLS: Overview of win runner and QTP testing tools for functional / regression testing, testing an application using win runner and QTP, synchronization of test cases, data driven testing, testing a web application.

TEXT BOOKS:
1.   Boris Beizer (2004), *Software Testing Techniques*, 2nd edition, Dreamtech Press, New Delhi, India.
2.   Dr. K. V. K. K. Prasad (2005), *Software Testing Tools*, Dreamtech Press, India.

REFERENCE BOOKS:
1.   William E. Perry (2006), *Effective methods of Software Testing*, 3rd edition, John Wiley Edition, USA.
2.   Meyers (2004), *Art of Software Testing*, 2nd edition, John Wiley, New Jersey, USA.

B. Tech. IT VII SEMESTER

NETWORK SECURITY AND CRYPTOGRAPHY

Course Code: **A1607**

L	T	P	C
4	-	-	4

UNIT - I
INTRODUCTION: Security trends, The OSI Security Architecture, Security Attacks, Security Services and Security Mechanisms, A model for Network security.

CLASSICAL ENCRYPTION TECHNIQUES: Symmetric Cipher Modes, Substitute Techniques, Transposition Techniques, Rotor Machines, Stenography.

UNIT - II
BLOCK CIPHER AND DATA ENCRYPTION STANDARDS: Block Cipher Principles, Data Encryption Standards, the Strength of DES, Differential and Linear Crypt Analysis, Block Cipher Design Principles.

ADVANCED ENCRYPTION STANDARDS: Evaluation Criteria for AES, the AES Cipher.

MORE ON SYMMETRIC CIPHERS: Multiple Encryption, Triple DES, Block Cipher Modes of Operation, Stream Cipher and RC4.
INTRODUCTION TO NUMBER THEORY: Prime Numbers, Fermat's and Euler's Theorem, Testing for Primality, The Chinese Remainder Theorem, Discrete logarithms,

UNIT - III
PUBLIC KEY CRYPTOGRAPHY AND RSA: Principles Public key crypto Systems the RSA algorithm, Key Management, Diffie Hellman Key Exchange, Elliptic Curve Arithmetic, Elliptic Curve Cryptography.

MESSAGE AUTHENTICATION AND HASH FUNCTIONS: Authentication Requirement, Authentication Function, Message Authentication Code, Hash Function, Security of Hash Function and MACs.

HASH AND MAC ALGORITHM: Secure Hash Algorithm, Whirlpool, HMAC, CMAC.

DIGITAL SIGNATURE: Digital Signature, Authentication Protocol, Digital Signature Standard.

UNIT - IV
AUTHENTICATION APPLICATION: Kerberos, X.509 Authentication Service, Public Key Infrastructure.

EMAIL SECURITY: Pretty Good Privacy (PGP) and S/MIME.

IP SECURITY: Overview, IP Security Architecture, Authentication Header, Encapsulating Security Payload, Combining Security Associations and Key Management.

UNIT - V
WEB SECURITY: Requirements, Secure Socket Layer (SSL) and Transport Layer Security (TLS), Secure Electronic Transaction (SET), Intruders, Viruses and related threats.

FIREWALL: Firewall Design principles, Trusted Systems.

TEXT BOOKS:
1. William Stallings (2006), *Cryptography and Network Security: Principles and Practice*, 4th edition, Pearson Education, India.
2. William Stallings (2000), *Network Security Essentials (Applications and Standards)*, Pearson Education, India.

REFERENCE BOOKS:
1. Charlie Kaufman (2002), *Network Security: Private Communication in a Public World*, 2nd edition, Prentice Hall of India, New Delhi.
2. Atul Kahate (2008), *Cryptography and Network Security,* 2nd edition, Tata Mc Grawhill, India.
3. Robert Bragg, Mark Rhodes (2004), *Network Security: The complete reference,* Tata Mc Grawhill, India.

B. Tech. IT VII SEMESTER

MOBILE APPLICATION DEVELOPMENT THROUGH J2ME

Course Code: A1608

L	T	P	C
3	1	-	4

UNIT - I
J2ME OVERVIEW: Java 2 Micro Edition and the World of Java, Inside J2ME, J2ME and Wireless Devices. *Small Computing Technology:* Wireless Technology, Radio Data Networks, Microwave Technology, Mobile Radio Networks, Messaging, Personal Digital Assistants.

UNIT - II
J2ME ARCHITECTURE AND DEVELOPMENT ENVIRONMENT: J2ME Architecture, Small Computing Device Requirements, Run-Time Environment, MIDlet Programming, Java Language for J2ME, J2ME Software Development Kits, Hello World J2ME Style, Multiple MIDlets in a MIDlet Suite, J2ME Wireless Toolkit. *J2ME Best Practices and Patterns:* The Reality of Working in a J2ME World, Best Practices

UNIT - III
COMMANDS, ITEMS AND EVENT PROCESSING: J2ME User Interfaces, Display Class, The Palm OS Emulator, Command Class, Item Class, Exception Handling. *High-Level Display: Screens:* Screen Class, Alert Class, Form Class, Item Class, List Class, Text Box Class, Ticker Class. *Low-Level Display: Canvas:* The Canvas, User Interactions, Graphics, Clipping Regions, Animation.

UNIT - IV
RECORD MANAGEMENT SYSTEM: Record Storage, Writing and Reading Records, Record Enumeration, Sorting Records, Searching Records, Record Listener. *JDBC Objects:* The Concept of JDBC, JDBC Driver Types, JDBC Packages, Overview of the JDBC Process, Database Connection, statement Objects, Result set, Transaction Processing, Metadata, Data Types, Exceptions. *JDBC and Embedded SQL:* Model Programs, Tables, Indexing, Inserting Data into Tables, Selecting Data from a Table, Metadata, Updating Tables, Deleting Data form a Table, Joining Tables, Calculating Data, Grouping and Ordering Data, Subqueries, VIEWs.

UNIT - V
GENERIC CONNECTION FRAMEWORK: The Connection, Hypertext Transfer Protocol, Communication Management Using HTTP Commands, Session Management, Transmit as a Background Process.

TEXT BOOKS:
1. James Keogh (2003), *J2ME: The Complete Reference*, Tata McGraw Hill, New Delhi.

REFERENCE BOOKS:
1. Michael Juntao Yuan (2004), *Enterprise J2ME: Developing Mobile Java Applications*, Pearson Education, India.
2. Ray Rischpater(2009), *Beginning Java ME Platform*, Apress, India.
3. Sing Li, Jonathan B. Knudsen (2005), *Beginning J2ME: from Novice to Professional*, 3rd edition, Apress, India.
4. J. Knudsen (2008), *Kicking Butt with MIDP and MSA: Creating Great Mobile Applications*, 1st edition, Pearson Education, India.

B. Tech. IT VII SEMESTER

DATA MINING AND DATA WAREHOUSING
(Interdepartmental Elective - II)

Course Code: **A1526**

	L	T	P	C
	4	-	-	4

UNIT - I
INTRODUCTION TO DATA MINING: Motivation, Importance, Definition of Data Mining, Kind of Data, Data Mining Functionalities, Kinds of Patterns, Classification of Data Mining Systems, Data Mining Task Primitives, Integration of A Data Mining System With A Database or Data Warehouse System, Major Issues In Data Mining, Types of Data Sets and Attribute Values, Basic Statistical Descriptions of Data, Data Visualization, Measuring Data Similarity.

PREPROCESSING: Data Quality, Major Tasks in Data Preprocessing, Data Reduction, Data Transformation and Data Discretization, Data Cleaning and Data Integration.

UNIT - II
DATA WAREHOUSING AND ON-LINE ANALYTICAL PROCESSING: Data Warehouse basic concepts, Data Warehouse Modeling - Data Cube and OLAP, Data Warehouse Design and Usage, Data Warehouse Implementation, Data Generalization by Attribute-Oriented Induction.

DATA CUBE TECHNOLOGY: Efficient Methods for Data Cube Computation, Exploration and Discovery in Multidimensional Databases.

UNIT - III
MINING FREQUENT PATTERNS, ASSOCIATIONS AND CORRELATIONS: Basic Concepts, Efficient and Scalable Frequent Itemset Mining Methods, Are All the Pattern Interesting, Pattern Evaluation Methods, Applications of frequent pattern and associations.

FREQUENT PATTERN AND ASSOCIATION MINING: A Road Map, Mining Various Kinds of Association Rules, Constraint-Based Frequent Pattern Mining, Extended Applications of Frequent Patterns.

UNIT - IV
CLASSIFICATION: Basic Concepts, Decision Tree Induction, Bayesian Classification Methods, Rule-Based Classification, Model Evaluation and Selection, Techniques to Improve Classification Accuracy: Ensemble Methods, Handling Different Kinds of Cases in Classification, Bayesian Belief Networks, Classification by Neural Networks, Support Vector Machines, Pattern-Based Classification, Lazy Learners (or Learning from Your Neighbors), Other Classification Methods.

UNIT - V
CLUSTER ANALYSIS: Basic Concepts of Cluster Analysis, Clustering structures, Major Clustering Approaches, Partitioning Methods, Hierarchical Methods, Density-Based Methods, Model-Based Clustering - The Expectation-Maximization Method, Other Clustering Techniques, Clustering High-Dimensional Data, Constraint-Based and User-Guided Cluster Analysis, Link-Based Cluster Analysis, Semi-Supervised Clustering and Classification, Bi-Clustering, Collaborative Clustering.

OUTLIER ANALYSIS: Why outlier analysis, Identifying and handling of outliers, Distribution-Based Outlier Detection: A Statistics-Based Approach, Classification-Based Outlier Detection, Clustering-Based Outlier Detection, Deviation-Based Outlier Detection, Isolation-Based Method: From Isolation Tree to Isolation Forest.

TEXT BOOKS:
1.   Jiawei Han, Micheline Kamber, Jian Pei (2012), *Data Mining: Concepts and Techniques*, 3rd edition, Elsevier, United States of America.

REFERENCE BOOKS:
1.   Margaret H Dunham (2006), *Data Mining Introductory and Advanced Topics*, 2nd edition, Pearson Education, New Delhi, India.
2.   Amitesh Sinha(2007), *Data Warehousing*, Thomson Learning, India.
3.   Xingdong Wu, Vipin Kumar (2009), *The Top Ten Algorithms in Data Mining*, CRC Press, UK.
4.   Max Barmer(2007), *Principles of Data Mining*, Springer, USA.

B. Tech. IT VII SEMESTER

POWER ELECTRONICS
Interdepartmental Elective - II
(Common to CSE & IT)

Course Code: **A1222**

L	T	P	C
4	-	-	4

UNIT - I
POWER SEMI CONDUCTOR DEVICES AND COMMUTATION CIRCUITS: Thyristors - silicon controlled rectifiers (SCR's), BJT, power MOSFET, power IGBT and their characteristics, other thyristors. Basic theory of operation of SCR, static characteristics, turn on and turn off methods, dynamic characteristics of SCR, turn on and turn off times, salient points, two transistor analogy, SCR UJT firing circuit, series and parallel connections of SCR's, snubber circuit details, specifications and ratings of SCR's, BJT, IGBT numerical problems, line commutation and forced commutation circuits.

UNIT - II
SINGLE PHASE CONTROLLED CONVERTERS: Phase control technique, single phase line commutated converters, midpoint and bridge connections, half controlled converters, fully controlled converters with resistive, RL loads and RLE load, derivation of average load voltage and current line commutated inverters, active and reactive power inputs to the converters without and with freewheeling diode. Effect of source inductance, derivation of load voltage and current, numerical problems.

UNIT - III
THREE PHASE LINE COMMUTATED CONVERTERS: Three phase converters, three pulse and six pulse converters, midpoint and bridge connections average load voltage with R and RL loads, effect of source inductance, dual converters (both single phase and three phase), waveforms, numerical problems.

AC VOLTAGE CONTROLLERS: AC voltage controllers, single phase two SCR's in anti parallel with R and RL loads, modes of operation of Triac, Triac with R and RL loads, derivation of RMS load voltage, current and power factor wave forms, firing circuits, numerical problems.

UNIT - IV
CYCLO CONVERTERS: Cyclo converters, single phase midpoint cyclo converters with resistive and inductive load (principle of operation only), bridge configuration of single phase cyclo converter (principle of operation only), waveforms.

CHOPPERS: Time ratio control and current limit control strategies, step down choppers derivation of load voltage and currents with R, RL and RLE loads, step up chopper, load voltage expression. Morgan's chopper, jones chopper and oscillation chopper (principle of operation only) waveforms, AC chopper, problems.

UNIT - V
INVERTERS: Inverters, single phase inverter, basic series inverter, basic parallel capacitor inverter bridge inverter, waveforms, simple forced commutation circuits for bridge inverters, MC Murray and MC Murray, bedford inverters, voltage control techniques for inverters pulse width modulation techniques, numerical problems.

TEXT BOOKS:
1. M. D. Singh, K. B. Kanchandhani (2008), *Power Electronics*, 3rd edition, Tata Mc graw hill publishing company, New Delhi.
2. M. H. Rashid (1998), *Power Electronics: Circuits, Devices and Applications*, 3rd edition, Prentice Hall of India, New Delhi.

REFERENCE BOOKS:
1. Vedam Subramanyam (1997), *Power Electronics*, New Age International (P) Limited, New Delhi.
2. V. R. Murthy (2005), *Power Electronics,* 1st edition, Oxford University Press, New Delhi.
3. P. C. Sen(2001), *Power Electronics*, 30th edition, Tata Mc Graw Hill Publishing, New Delhi.

VLSI DESIGN
Interdepartmental Elective - II
(Common to CSE & IT)

Course Code: **A1429**

	L	T	P	C
	4	-	-	4

UNIT - I
MOS TRANSISTOR THEORY: Introduction, MOS Device Design Equations–Threshold Voltage-Body Effect, Channel Length Modulation, MOS Models, the Complementary CMOS Inverter-DC characteristics, the differential inverter, the Tristate inverter, Bipolar devices.

UNIT - II
CMOS PROCESSING TECHNOLOGY: Overview-Wafer Processing, Oxidation, Epitaxy, deposition, ion-implantation and diffusion, the silicon gate process, Basic CMOS technology, Latchup – Origin of Latchup, Latchup triggering, Latchup prevention.

UNIT - III
MOS-CIRCUIT DESIGN PROCESSES: MOS Layers, Stick Diagrams-nMOS Design style, CMOS design style, Design Rules and Layout-Lambda based design rules, contact cuts, double metal MOS process rules, CMOS Lambda based design rules, general observations on design rules, 2 µm Double metal Double poly CMOS rules, Layout Diagrams.

CIRCUIT CHARACTERIZATION: Introduction, Resistance Estimation, Capacitance Estimation, Inductance, Switching Characteristics-analytic delay models, Power Dissipation, Scaling of MOS Transistor Dimensions.

UNIT - IV
CMOS CIRCUIT DESIGN AND LOGIC DESIGN: Introduction, CMOS logic gate design, Basic Physical design of simple logic gates, CMOS logic structures-CMOS complementary logic, Pseudo-nMOS logic, Dynamic CMOS logic, Pass transistor Logic, CMOS Domino Logic.

UNIT - V
CMOS TESTING: Need for Testing, Manufacturing Test Principles-fault models, Observability, Controllability, Design Strategies for Test, Chip Level test Techniques.

TEXT BOOKS:
1. Neil H. E. Weste, Kamran Eshraghian (2001), *Principles of CMOS VLSI Design – A System Perspective*, 2nd Edition, Pearson Education Asia, India.
2. Kamran Eshraghian, Dougles A. Pucknell, Sholeh Eshraghian (2005)*, Essentials of VLSI Circuits and Systems*, PHI, New Delhi.

REFERENCE BOOKS:
1. John .P. Uyemura (2011), *Introduction to VLSI Circuits and Systems,* John Wiley, India.
2. S.M. Sze (2003), *VLSI Technology,* 2nd Edition, Tata McGraw Hill, New Delhi.

ROBOTICS
Interdepartmental Elective - II
(Common to CSE & IT)

Course Code: **A1337**

L	T	P	C
4	-	-	4

UNIT - I

INTRODUCTION: Automation and Robotics, CAD/CAM and Robotics, an over view of Robotics, present and future applications – classification by coordinate system and control system.

COMPONENTS OF THE INDUSTRIAL ROBOTICS: Function line diagram representation of robot arms, common types of arms. Components, Architecture, number of degrees of freedom – Requirements and challenges of end effectors, determination of the end effectors, comparison of Electric, Hydraulic and Pneumatic types of locomotion devices.

UNIT - II

MOTION ANALYSIS: Homogeneous transformations as applicable to rotation and translation, problems.

MANIPULATOR KINEMATICS: Specifications of matrices, D-H notation joint coordinates and world coordinates Forward and inverse kinematics, problems.

UNIT - III

MANIPULATOR DYNAMICS - I: Differential transformation and manipulators, Jacobians, problems. Dynamics: Lagrange, Euler and Newton, Euler formations, Problems.

MANIPULATOR DYNAMICS - II: Trajectory planning and avoidance of obstacles, path planning, Skew motion, joint integrated motion, straight line motion, Robot programming, languages and software packages.

UNIT - IV

ROBOT ACTUATORS AND FEEDBACK COMPONENTS: Actuators: Pneumatic, Hydraulic actuators, electric & stepper motors. Feedback components: position sensors, potentiometers, resolvers, encoders, Velocity sensors.

UNIT - V

ROBOT APPLICATION IN MANUFACTURING: Material Transfer, Material handling, loading and unloading, Processing spot and continuous arc welding & spray painting, Assembly and Inspection.

TEXT BOOKS:
1. M. P. Groover (2010), *Industrial Robotics*, 3rd edition, Pearson Education, New Delhi.
2. K.S. Fu (2010), *Robotics*, 1st edition, Tata Mc Graw Hill Publishing Company Ltd., New Delhi.

REFERENCE BOOKS:
1. R.K. Mittal, I. J. Nagrath (2012), *Robotics and Control*, 1st edition, Tata Mc Graw Hill Publishing Company Ltd., New Delhi.
2. P. Coiffet, M. Chaironze (2010), *An Introduction to Robot Technology*, 3rd edition, Kogam Page Ltd., London.
3. Richard D. Klafter(2010), *Robotic Engineering*, 2nd edition, Prentice Hall of India, New Delhi.

AIR POLLUTION AND CONTROL METHODOLOGIES
Interdepartmental Elective - II
(Common to CSE & IT)

Course Code: **A1148**

L	T	P	C
4	-	-	4

UNIT - I
AIR POLLUTION: Definitions, scope, significance and episodes, air pollutants – classifications - natural and artificial - primary and secondary, point and non- point, line and areal sources of air pollution- stationary and mobile sources. Effects of air pollutants on man, material and vegetation: global effects of air pollution - green house effect, heat islands, acid rains, ozone holes etc.

UNIT - II
THERMODYNAMICS AND KINETICS OF AIR - POLLUTION: Applications in the removal of gases like SO_x, NO_x, CO, HC etc., air-fuel ratio. Computation and Control of products of combustion. Meteorology and plume Dispersion,

UNIT - III
PROPERTIES OF ATMOSPHERE: Heat, Pressure, Wind forces, Moisture and relative Humidity, Influence of Meteorological phenomena on Air Quality-wind rose diagrams.

LAPSE RATES: Pressure Systems, Winds and moisture plume behavior and plume Rise Models; Gaussian Model for Plume Dispersion.

UNIT - IV
CONTROL OF PARTICULATES: Control at Sources, Process Changes, Equipment modifications, Design and operation of control. Equipment's – Settling Chambers, Centrifugal separators, filters Dry and Wet scrubbers, Electrostatic precipitators. General Methods of Control of NO_x and So_x emissions – In-plant Control Measures, process changes, dry and wet methods of removal and recycling.

UNIT - V
AIR QUALITY MANAGEMENT: Monitoring of SPM, SO; NO and CO Emission Standards.

TEXT BOOKS:
1.   M. N. Rao, H. V. N. Rao (1988), *Air pollution*, Tata McGraw Hill Education, New Delhi, India.
2.   C. S. Rao (2006), *Environmental Pollution control Engineering*, New age international, New Delhi, India.

REFERENCE BOOKS:
1.   R. K. Trivedy, P.K. Goel (2003), *Introduction to Air pollution*, ABD Publications, New Delhi, India.
2.   Wark, Warner (1998), *Air pollution its origin and control,* Addison-Wesley, New York.

B. Tech. IT VII SEMESTER

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INTRODUCTION TO AIRCRAFT INDUSTRY
Interdepartmental Elective - II
(Common to CSE & IT)

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Course Code: **A1701**

L	T	P	C
4	-	-	4

This Course is Designed in Collaboration with Insfosys Technologies Limited.

UNIT - I
AIRCRAFT INDUSTRY OVERVIEW: Evolution and History of Flight, Types Of Aerospace Industry, Introduction to ages of engineering, Aerospace Manufacturing, Introduction to the space environment & human space exploration.

UNIT - II
INTRODUCTION TO AIRCRAFTS, DURATION: Basic components of an Aircraft, Structural members, Aircraft Axis System, Aircraft Motions, Control surfaces and High lift Device. Types of Aircrafts - Lighter than Air/Heavier than Air Aircrafts Conventional Design Configurations based on Power Plant Location, Wing vertical location, intake location, Tail Unit Arrangements, Landing Gear Arrangements. Unconventional Configurations-Biplane, Variable Sweep, Canard Layout, Twin Boom Layouts, Span loaders, Blended Body Wing Layout, STOL and STOVL Aircraft, Stealth Aircraft. Advantages and disadvantages of these Configurations.

UNIT - III
INTRODUCTION TO AIRCRAFT SYSTEMs: Types of Aircraft Systems, Mechanical Systems, Electrical and Electronic Systems, Auxiliary systems. *Mechanical Systems*: Environmental control systems (ECS), Pneumatic systems, Hydraulic systems, Fuel systems, Landing gear systems, Engine Control Systems, Ice and rain protection systems, Cabin Pressurization and Air Conditioning Systems, Steering and Brakes Systems Auxiliary Power Unit. *Electrical systems:* Avionics, Flight controls, Autopilot and Flight Management Systems, Navigation Systems, Communication, Information systems, Radar System.

UNIT - IV
BASIC PRINCIPLES OF FLIGHT: Significance of speed of Sound, Air speed and Ground Speed, Properties of Atmosphere, Bernoulli's Equation, Forces on the airplane, Airflow over wing section, Pressure Distribution over a wing section, Generation of Lift, Drag, Pitching moments, Types of Drag, Lift curve, Drag Curve, Lift/Drag Ratio Curve, Factors affecting Lift and Drag, Center of Pressure and its effects. Aerofoil Nomenclature, Types of Aerofoil, Wing Section- Aerodynamic Center, Aspect Ratio, Effects of lift, Drag, speed, Air density on drag.

UNIT - V
BASICS OF FLIGHT MECHANICS: Mach Waves, Mach Angles, Sonic and Supersonic Flight and its effects.

STABILITY AND CONTROL: Degree of Stability- Lateral, Longitudinal and Directional Stability and controls of Aircraft. Effects of Flaps and Slats on Lift Coefficients, Control Tabs, Stalling, Landing, Gliding Turning, Speed of Sound, Mach Numbers and Shock Waves.

AIRCRAFT PERFORMANCE AND MANEUVERS: Power Curves, Maximum and minimum speeds of horizontal flight, Effects of Changes of Engine Power, Effects of Altitude on Power Curves, Forces acting on a Aeroplane during a Turn, Loads during a Turn, Correct and incorrect Angles of Bank, Aerobatics, Inverted Maneuvers, Maneuverability

TEXT BOOKS:
1.   Anderson J. D. (2012), *Introduction to Flight*, 7th edition, McGraw Hill, New Delhi.
2.   Shevell (2004), *Fundamentals of Flight*, 2nd edition, Pearson Education Limited, India.
3.   Allan Seabridge, Ian Moir (2008), *Aircraft Systems: Mechanical, Electrical and Avionics Subsystems Integration,* 3rd edition, John Willey & Sons, New Delhi, India.

REFERENCES BOOKS:
1.   A.C Kermode (2012), *Mechanics of Flight*, 12th edition, Pearson Education Limited, India.
2.   Kermode, A.C. (1989), *Flight without Formulae*, 5th edition, Pearson Education Limited, India.

OPERATIONS RESEARCH
Professional Elective - I
(Common to CSE, IT, ME & ECE)

Course Code: **A1331**

L	T	P	C
3	1	-	4

UNIT - I
INTRODUCTION TO OPERATIONS RESEARCH: Basics definition, scope, objectives, phases, models and limitations of Operations Research. Linear Programming Problem, Formulation and Graphical solution of Linear Programming Problem. Simplex Method, Artificial variables Techniques, big -M method, two -phase simplex method, degeneracy and unbound solutions.

UNIT - II
TRANSPORTATION PROBLEM: Formulation, solution, unbalanced Transportation problem. Finding basic feasible solutions, North-West corner rule, least cost method and Vogel's approximation method. Optimality test - MODI method.

 ASSIGNMENT MODEL: Formulation, Hungarian method for optimal solution, solving unbalanced problem, Traveling salesman problem as assignment problem.

UNIT - III
SEQUENCING MODELS: Solution of Sequencing Problem, Processing n Jobs through two machines, Processing n Jobs through three machines, Processing two Jobs through m machines, Processing n Jobs through m Machines.

QUEUING THEORY: Introduction, Single Channel, Poisson arrivals, exponential service times with infinite population and finite population models.

UNIT - IV
 REPLACEMENT MODELS: Replacement of Items that Deteriorate whose maintenance costs increase with time without change in the money value, Replacement of items that fail suddenly, individual replacement policy, group replacement policy.

INVENTORY MODELS: Inventory costs, Models with deterministic demand model: (a) Demand rate uniform and production rate infinite, (b) Demand rate non-uniform and production rate infinite, (c) Demand rate uniform and production rate finite.

UNIT - V
GAME THEORY: Competitive game, rectangular game, saddle point, minimax (maximin) method of optimal strategies, value of the game. Solution of games with saddle points, dominance principle, Rectangular games without saddle point, mixed strategy for 2 X 2 games.

DYNAMIC PROGRAMMING: Characteristics of dynamic programming, Dynamic programming approach for priority management employment smoothening, Capital budgeting, Stage Coach/Shortest Path, cargo loading and Reliability problems.

TEXT BOOKS:
1. A. M. Natarajan, P. Balasubramani, A. Tamilarasi (2006), *Operations Research*, Pearson Education, India.
2. S. D. Shama (2009), *Operation Research,* Tata McGraw Hill, New Delhi.

REFERENCE BOOKS:
1. J. K. Sharma (2007), *Operations Research – Theory and Applications,* 3rd edition, Macmillan India Ltd, India.
2. R. Panneerselvam (2008), *Operations Research*, 2nd edition, Prentice Hall of India, India.
3. F. S. Hillier, G. J. Lieberman (2007), *Introduction to Operations Research,* 8th edition, Tata McGraw Hill, New Delhi, India.

B. Tech. IT VII SEMESTER

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RATIONAL APPLICATION DEVELOPER
Professional Elective – I
(Common to CSE & IT)

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Course Code: **A1527**

L	T	P	C
3	1	-	4

This Course is designed in Collaboration with IBM India Private Limited.

UNIT - I
WORKBENCH BASICS: Set Workbench preferences, Work with perspectives and views, Use the import and export wizards, Use the Help feature to aid in development activities, Use the Local History to compare and replace resources, Manage workspaces.

JAVA DEVELOPMENT: Create Java projects packages, classes, and methods, Manage the Java Build Path, Use the Outline view, Use the refactoring features, Use the Java editor features such as content assist and code formatting, Add and organize import declarations, Use the Java search function, Use the Task and Problems views, Use the Hierarchy view, Use the resource and project property dialogues.

UNIT - II
WEB DEVELOPMENT BASICS: Create dynamic and static Web projects, Understand classpath and module dependencies, Use Page Designer to add and modify HTML, JavaScript, and JSP content, Configure Web project properties, Create and configure Servlets.

UNIT - III
RUNNING APPLICATIONS: Use WebSphere Application Server V6 to run J2EE applications, Create and configure data sources, Add and remove projects from the server, Run stand-alone Java applications, Locate and view WebSphere application server logs.

DATABASES: Create a database connection, use the SQL Statement wizard, sample contents of a database table.

UNIT - IV
WEB DEVELOPMENT - ADVANCE: Understand the available Struts development tools, understand the available JSF (JavaServer Faces) development tools.

PACKAGING AND DEPLOYMENT: Create J2EE projects, Import and export J2EE modules, Create and locate resources in the appropriate location of the project hierarchy, Work with Web and Application Deployment Descriptor Editors.

UNIT - V
DEBUGGING WEB APPLICATION: Perform JSP debugging, Use step-by-step debugging.

TEST WEB APPLICATION: Perform unit testing using Junit, Perform Web Application testing.

TEXT BOOKS:
1. Ueli Wahli (2010), *Rational Application Developer V7.5 Programming Guide*, 1st edition, Redbooks, SPD, New Delhi, India.

REFERENCE BOOKS:
1. Jane Fung, Christina Lau, Ellen McKay, Valentina Birsan, Colin Yu, Joe Winchester, Dr. Gili Mendel, Gary Flood , Peter Walker, Timothy deBoer, Yen Lu, James Hunter(2005), *An Introduction to IBM Rational Application Developer: A Guided Tour (Ibm Illustrated Guide Series)*, Mc Press, IBM Press, USA.
2. Colette Burrus, Stephanie Parkin (2008), *Building Applications with IBM Rational Application Developer and JavaBeans*, 2nd edition, Mc Press, IBM Press, USA.

DISTRIBUTED OPERATING SYSTEMS
Professional Elective – I
(Common to CSE & IT)

Course Code: **A1529**

L	T	P	C
3	1	-	4

UNIT - I
INTRODUCTION TO DISTRIBUTED SYSTEMS: What is a Distributed System, Hardware concepts, software concepts, design issues.

UNIT - II
COMMUNICATION IN DISTRIBUTED SYSTEMS: Layered Protocols, ATM networks, the client / server model, remote procedure call, group communication.

UNIT - III
SYNCHRONIZATION IN DISTRIBUTED SYSTEM: Clock synchronization, mutual exclusion, election algorithms, atomic transactions, deadlocks in distributed systems.

UNIT - IV
PROCESS AND PROCESSORS IN DISTRIBUTED SYSTEM: Threads, system models, processors allocation, scheduling in distributed system, fault tolerance, real time distributed system.

DISTRIBUTED FILE SYSTEMS: Distributed file system design, distributed file system implementation, trends in distributed file system.

UNIT - V
DISTRIBUTED SHARED MEMORY: Introduction to Shared memory, Consistency models, page based distributed shared memory, shared variable distributed shared memory, object based distributed shared memory.

TEXT BOOKS:
1.   Andrew S. Tanenbanm (2007), *Distributed Operating Systems,* Pearson Education Inc, India.

REFERENCE BOOKS:
1.   Makes Singhal, Niranjan G. Shivaratna (2001), *Advanced Concepts in Operating Systems,* Tata McGraw-Hill Edition, New Delhi, India.

B. Tech. IT VII SEMESTER

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BUILDING ENTERIPSE APPLICATIONS
Professional Elective - I
(Common to CSE & IT)

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Course Code: **A1609**

L	T	P	C
3	1	-	4

This Course is designed in Collaboration with Infosys Technologies Limited.

UNIT - I
INTRODUCTION: Introduction to Enterprise Applications and their types, Software Engineering Methodologies, Life cycle of raising Enterprise Application, Introduction to skills required to build an Enterprise Application, Key determinants of successful Enterprise Applications, and measuring the success of Enterprise Application.

UNIT - II
INCEPTING ENTERPRISE APPLICATIONS: Enterprise Analysis, Business Modeling, Requirements Elicitation, Actors and Use Cases Modeling, Prototyping, Non Functional Requirements, Requirements Validation, Planning and Estimation.

UNIT - III
ARCHITECTING AND DESIGNING ENTERPRISE APPLICATION: Concept of Architecture, Views and Viewpoints, Enterprise Architecture, Logical Architecture, Technical Architecture – Design, different Technical Layers, Best Practices, Data Architecture and Design – Relational, XML, and other Structured Data Representations, Infrastructure Architecture and Design Elements – Networking, Internetworking, and Communication Protocols, IT Hardware and Software, Middleware, Policies for Infrastructure Management, Deployment Strategy, Documentation of Application Architecture and Design.

UNIT - IV
CONSRUCTING ENTERPRISE APPLICATIONS: Construction readiness of Enterprise Applications – defining a Construction Plan, defining a Package Structure, Setting up a Configuration Management Plan, Setting up a Development Environment, Introduction to the concept of Software Construction Maps, Construction of Technical Solutions Layers, Methodologies of Code Review, Static Code Analysis, Build Process and Unit Testing, Dynamic Code Analysis – Code Profiling and Code Coverage.

UNIT - V
TESTING ROLLING OUT ENTERPRISE APPLICATIONS: Type and methods of testing an Enterprise Application, Testing Levels and Approaches, Enterprise Application Environments, Integration Testing, Performance Testing, Penetration Testing, Usability Testing, Globalization Testing and Interface Testing, User Acceptance Testing, Rolling out an Enterprise Application.

TEXT BOOKS:
1. Anubhav Pradhan, SathReesha B. Nanjappa, Senthil K. Nallasamy, VeeraKumar Esakimuthu(2010), *Raising Enterprise Applications: A Software Engineering Perspective*, Wiley India Pvt Ltd, India.

REFERENCE BOOKS:
1. Raffaele Garofalo(2011), *Building Enterprise Applications with Windows® Presentation Foundation and the Model View View Model Pattern*, O'Reilly Media, Inc, India.

BIOINFORMATICS
Professional Elective - I
(Common to CSE & IT)

Course Code: **A1610**

L	T	P	C
3	1	-	4

UNIT - I
INTRODUCTION TO BIOINFORMATICS: Scope of bioinformatics, elementary commands and protocols, FTP, Telnet, HTTP, primer on information theory.

INTRODUCTION TO HOMOLOGY: Introduction to homology (with special mention to Charles Darwin, Sir Richard Owen, Willie Henning, Alfred Russel Wallace).

UNIT - II
SPECIAL TOPICS IN BIOINFORMATICS: DNA mapping and sequencing, Map alignment, large scale sequencing methods, Shotgun and Sanger method.

UNIT - III
SEQUENCE ALIGNMENT AND DYNAMIC PROGRAMMING: Heuristic alignment algorithms, Global sequence alignments- Needleman-Wunsch algorithm, Smith-Waterman algorithm - local sequence alignments, Amino acid substitution matrices- PAM and BLOSUM.

UNIT - IV
PRIMARY DATABASE AND THEIR USE: Introduction to biological databases, organization and management of databases, Searching and retrieval of information from the World Wide Web, Structure databases - PDB (Protein Data Bank), Molecular Modeling Databases (MMDB), primary databases- NCBI, EMBL, DDBJ.

SECONDARY DATABASES: Introduction to secondary databases- organization and management of databases Swissprot, PIR, KEGG.

UNIT - V
BIOCHEMICAL DATA BASES: Introduction to biochemical databases, organization and management of databases, KEGG, EXGESCY, BRENDA, WIT.

TEXT BOOKS:
1.   Hooman H. Rashidi, Lukas K. Buehler (2005), *Bioinformatics Basics, Applications in Biological Science and Medicine*, 2nd edition, CRC Press, Taylor and Francis Group, USA.
2.   David W. Mount (2005), *Bioinformatics- Sequence and Genome Analysis*, 2nd edition, Cold Spring Harbor Laboratory Press, New York.

REFERENCE BOOKS:
1.   Harshawardhan P. Bal (2005), *Bioinformatics Principles and Applications,* Tata McGraw Hill, New Delhi.
2.   Cynthia Gibbas, Per Jamberk(2001), *Developing Bioinformatics Skills,* Cold Spring Harbor Laboratory Press, New York.
3.   C. Stan Tsai (2002), *An Introduction to Computational Biochemistry*, John Wiley & Sons Inc, New York.

IMAGE PROCESSING
(Professional Elective - I)

Course Code: **A1611**

L	T	P	C
3	1	-	4

UNIT - I
FUNDAMENTALS OF IMAGE PROCESSING: Image acquisition, image model, sampling, quantization, relationship between pixels, distance measures, connectivity, image geometry, photographic film.

IMAGE TRANSFORMS: A detail discussion on Fourier transform, DFT, FFT, properties. A brief discussion on WALSH transform, WFT, HADAMARD transform, DCT.

UNIT - II
IMAGE ENHANCEMENT (by SPATIAL Domain Methods): Histogram Processing - definition, equalization, matching, local enhancement, use of histogram statics for image enhancement, Arithmetic and logical operations, pixel or point operations, size operations, Smoothing filters-mean, median, mode filters, sharpening spatial filtering.

IMAGE ENHANCEMENT (by FREQUENCY Domain Methods): Design of low pass, high pass, edge enhancement, smoothening filters in frequency domain. Butter worth filter, sharpening frequency domain filters, homomorphic filters in frequency domain.

UNIT - III
IMAGE COMPRESSION: Fundamentals, image compression models, elements of information theory, error-free compression, lossy compression, image compression standards.

UNIT - IV
IMAGE SEGMENTATION: Detection of discontinuities, edge linking and boundary detection, thresholding, region based segmentation, segmentation by morphological watersherds, the use of motion in segmentation.

UNIT - V
COLOR IMAGE PROCESSING: Fundamentals, models, pseudo color image, color transformation, smoothing, color segmentation, noise in color image, color image compression.

MORPHOLOGY: Dilation, erosion, opening, closing, hit-and-miss transform, boundary extraction, region filling, connected components, thinning, thickening, skeletons, pruning extensions to gray scale image application of morphology in image processing.

TEXT BOOKS:
1. Rafael C. Gonzalez, Richard E. Woods (2008), *Digital Image Processing*, Low Price Edition, Pearson Education, New Delhi, India.

REFERENCE BOOKS:
1. Arthur R. Weeks (1996), *Fundamentals of Electronic Image Processing*, Prentice Hall of India, New Delhi.
2. Milan Sonka, Vaclav Hlavac, Roger Boyle (2008), *Image processing, Analysis and Machine vision*, Thomson Publications, India.

B. Tech. IT VII SEMESTER

SOFTWARE TESTING AND QUALITY ASSURANCE LAB
(Common to CSE & IT)

Course Code: **A1530**

L	T	P	C
-	-	3	2

LIST OF EXPERIMENTS:

1. Generate meaningful Unit test cases for the Project module-wise and test them for defects, identify the defects from the code and correct them. Try Identify the various unit test metrics studied already to identify module stability. Fill the unit test report supplied by the instructor.

2. Generate meaningful Integration test cases for the Project and test them for defects, identify the defects and correct them. Try Identify the various Integration test metrics studied already to identify module stability. Fill the Integration test report supplied by the instructor.

3. Generate meaningful System test cases for the Project and test them for defects, identify the defects and correct them. Try Identify the various System test metrics studied already to identify system stability. Fill the System test report supplied by the instructor.

4. Generate meaningful User Acceptance cases for the Project and test them for defects, identify the defects and correct them. Try Identify the various System test metrics studied already to identify system stability. Fill the System test report supplied 0062y the instructor.

5. Test the supplied project/Application through testing tool: Win Runner, by generating appropriate test cases.

6. Test the supplied project/Application through testing tool: Load Runner by generating appropriate test cases.

7. Test the supplied project/Application through testing tool: Quick Test Professional by generating appropriate test cases.

TEXT BOOKS:
1. Dr. K.V.K.K. Prasad (2007), *Software Testing Tools*, Dream tech Press.
2. Boris Beizer(2003), *Software Testing Techniques*, 2nd edition, Dream tech Press.

B. Tech. IT VII SEMESTER

MOBILE APPLICATION DEVELOPMENT THROUGH J2ME LAB

Course Code: **A1612**

L	T	P	C
-	-	3	2

1. Installation of Java Wireless Toolkit (J2ME)

2. Working with J2ME Features:

Working with J2ME Features: Say, creating a *Hello World* program Experiment with the most basic features and mobile application interaction concepts (lists, text boxes, buttons, radio boxes, soft buttons, graphics, etc)

2.1 Create a program which creates to following kind of menu.

* cut
* copy
* past
* delete
* select all
* unselect all

2.2 Event Handling.

Create a menu which has the following options:

* cut - can be on/off
* copy - can be on/off
* paste - can be on/off
* delete - can be on/off
* select all - put all 4 options on
* unselect all - put all 4 options off

2.3. Input checking

Create an MIDP application which examine, that a phone number, which a user has entered is in the given format.

* Area code should be one of the following: 040, 041, 050, 0400, 044
* There should 6-8 numbers in telephone number (+ area code)

3 .Threads & High Level UI:

   3.1 Create a slide show which has three slides, which includes only text. Program should change to the new slide after 5 seconds. After the third slide program returns to the first slide.
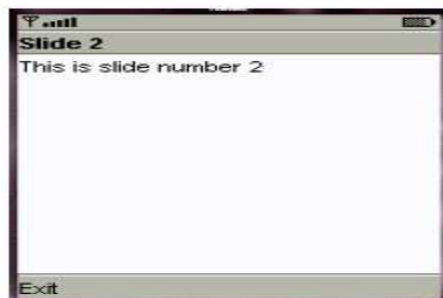
3.2 High-level UI

Create a MIDP application, which show to the user 5-10 quiz questions. All questions have 4 possible options and one right option exactly. Application counts and shows to the user how many right answers were right and shows them to user.

3.3 Create a MIDP application,

where the user can enter player name and points. The program saves the information to the record using RMS at MIDP device. Program should also print out the top 10 player list to the end user. You can use this class in your game if you made own class for saving and reading record sets.
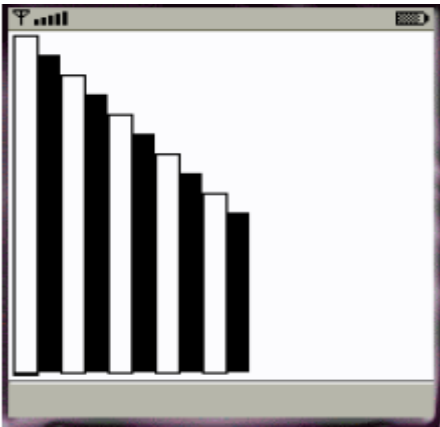
4. Working on Drawing and Images

4.1 Create a slide show which has three slides, which includes pictures at PNG format. Program should change to the new slide other 5 seconds.

4.2 Create a MIDP application, which draws a bar graph to the display. Data values can be given at int[] array.

4.3 Create a MIDP application, which draws a bar graph to the display. Data values can be given at int[] array. You can enter four data (integer) values to the input text field.
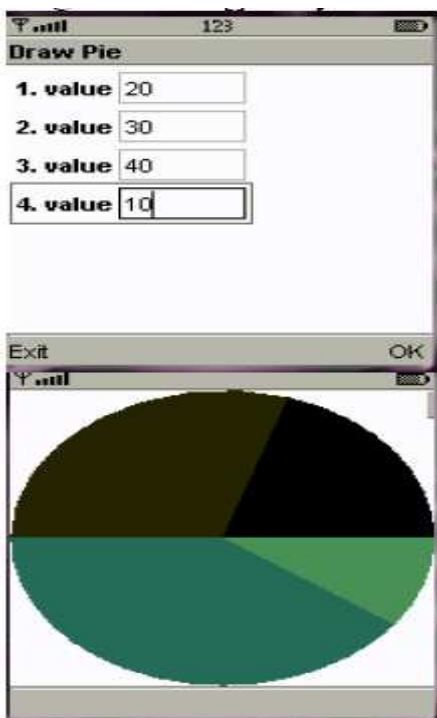
5. Developing Networked Applications using the Wireless Toolkit

Creating a Simple Client-Server Application
Create, compile and run a basic UDP-based client-server application.

Creating the Datagram Server project
1) Click on Wireless Toolkit 2.5.2 under the group: **All Programs→Sun Java (TM) Wireless Toolkit 2.5.2**.
2) Click on '**New Project...**' button.
3) Enter project name as '**DatagramServer**'. Enter MIDlet name as '**DatagramServer**'. Note that the Midlet name is the same as the name of the class in the source code, which extends the MIDlet class, otherwise the application won't run.
4) Another window pops up where it is required to select a target platform. Select '**MIDP 1.0**' from the drop down list.

5) After clicking OK, the project is created; and the Wireless Toolkit tells that the name of the folder where source code files are created. The path of the source code folder is displayed in the debug output window.

Creating and Compiling the DatagramServer source files
The Wireless Toolkit does not come with an IDE by default so Use any IDE or a text editor like *Notepad*.
1) Create a new text file called **DatagramServer.java** in the source folder of the project. The exact path of this folder is displayed in the Wireless Toolkit window.
2) Paste contents **DatagramServer.java** from into the source file.

Running your Server application on the Phone simulator
1) After compiling the project successfully, click on the Run button in the Wireless Toolkit window.
2) A graphical window depicting a phone handset will appear with the name of your application highlighted on its screen as shown below.
3) To start the application, click on the right soft-key (marked with a dot) below the '**Launch'** command.
4) The phone simulator might ask if it is OK to run the network application. Select '**Yes**' by clicking on the appropriate soft-key. The server is now up and running.
5) Keep the server running during the creation, compilation and running of the Datagram Client application.

Creating the DatagramClient project
1) Use the same instance of the Wireless Toolkit that is used for creating and compiling the Datagram Server project.
2) Click on '**New Project...**' button.
3) A new window pops up. Enter project name as '**DatagramClient**'. Enter MIDlet name as '**DatagramClient**'. Note that the Midlet name is the same as the name of the class in the source code, which extends the MIDlet class.
4) Another window pops up where one has to select a target platform. Select '**MIDP 1.0**' from the drop down list.
5) After clicking OK, the project is created and the Wireless Toolkit tells where to place the source code files. The path of the source code folder is displayed in the debug output window as explained before.

Creating and Compiling the DatagramClient source files
1) Create a new text file called **DatagramClient.java** in the source folder of the project.
2) Paste contents **DatagramClient.java** into the source file.
3) Then click on the Build button in the Wireless Toolkit window. If the compilation is OK, it will say Build Complete in the window's debug output window, otherwise it will show the errors. Note: In the source code, use the System.out.println() statement to output debug information to this window.

Running your Client application on the Phone simulator
1) After compiling the project successfully, click on the Run button in the Wireless Toolkit window.
2) A graphical window depicting a phone handset will appear with the name of the application highlighted on its screen.
3) To start the application, click on the right soft-key (marked with a dot) below the '**Launch**' command.
4) The phone simulator might ask if it is OK to run the network application. Select '**Yes**' by clicking on the appropriate soft-key. The client is now up and running.
5) When the client executes on the phone simulator, one should see a text box with the caption 'Message'. Enter any message and press the right soft-key (corresponding to Send). If the client-server application is working properly, the screen of the server phone will display the message sent by the client and the client screen will now display a message sent by the server in response. The response message from the server is the original client message in reverse.
6) Try various features of the phone simulator including the different look-and-feel options.

6. Authentication with a Web Server

6.1 Write a sample program to show how to make a SOCKET Connection from j2me phone.

This J2ME sample program shows how to how to make a SOCKET Connection from a J2ME Phone. Many a times there is a need to connect backend HTTP server from the J2ME application. shows how to make a SOCKET connection from the phone to port 80.

6.2 Login to HTTP Server from a J2ME Program

This J2ME sample program shows how to display a simple LOGIN SCREEN on the J2ME phone and how to authenticate to a HTTP server.

Many J2ME applications for security reasons require the authentication of the user. This free J2ME sample program, shows how a J2ME application can do authentication to the backend server.

Note: Use Apache Tomcat Server as Web Server and Mysql as Database Server.

7. Web Application using J2ME
The following should be carried out with respect to the given set of application domains: (Assume that the Server is connected to the well-maintained database of the given domain. Mobile Client is to be connected to the Server and fetch the required data value/information)

- Students Marks Enquiry
- Town/City Movie Enquiry
- Railway/Road/Air (For example PNR) Enquiry/Status
- Sports (say, Cricket) Update
- Town/City Weather Update
- Public Exams (say Intermediate or SSC)/ Entrance (Say EAMCET) Results Enquiry

Divide Student into Batches and suggest them to design database according to their domains and render information according the requests.

SYLLABI FOR VIII SEMESTER

INDUSTRIAL MANAGEMENT AND PSYCHOLOGY
(Common to CSE & IT)

Course Code: **A1015**

L	T	P	C
3	1	-	4

UNIT - I

CONCEPTS OF MANAGEMENT AND ORGANISATION: Functions of management, evolution of management thought, Taylor's scientific management, fayol's principles of management, Hertzberg's Maslow's hierarchy of human needs, systems approach to management.

DESIGNING ORGANISATIONAL STRUCTURES: Basic concepts related to organisation - departmentation and decentralization, types of mechanistic and organic structures of organisation (line organization, line and staff organization, functional organization.

UNIT - II

PLANT LOCATION: Definition, factors affecting the plant location, comparison of rural and urban sites, methods for selection of plant- matrix approach. Plant layout - definition, objectives, types of production, types of plant layout, various data analyzing forms travel chart.

WORK STUDY: Definition, objectives, method study - definition, objectives, steps involved- various types of associated charts, difference between micromotion and memomotion studies. Work measurement- definition, time study, steps involved, equipment, different methods of performance rating, allowances, standard time calculation. Work Sampling - definition, steps involved, standard time calculations, differences with time study.

UNIT - III

INTRODUCTION TO PERT / CPM : Project management, network modeling-probabilistic model, various types of activity times estimation, programme evaluation review techniques, critical path, probability of completing the project, deterministic model, critical path method (CPM), critical path calculation, crashing of simple of networks.

INSPECTION AND QUALITY CONTROL: Types of inspections, statistical quality control, techniques, variables and attributes, assignable and non assignable causes, variable control charts, and R charts, attributes control charts, p charts and c charts. Acceptance sampling plan, single sampling and double sampling plans, OC curves. Introduction to TQM - quality circles, ISO 9000 series procedures.

UNIT - IV

MATERIALS MANAGEMENT: Objectives, inventory functions, types, associated costs, inventory classification techniques-ABC and VED analysis. Inventory control systems, continuous review system, periodical review system. Stores management and stores records. Purchase management, duties of purchase of manager, associated forms.

INTRODUCTION TO HUMAN RESOURCE MANAGEMENT: Functions of HRM, job evaluation, different types of evaluation methods. Job description, merit rating, difference with job evaluation, different methods of merit ratings, wage incentives, different types of wage incentive schemes. Marketing, marketing vs. selling, marketing mix, product life cycle.

UNIT - V

INDUSTRIAL PSYCHOLOGY: Definition and concept, industrial psychology vs. personnel management, aims and objectives of industrial psychology, scope of industrial psychology, individual and group, individual differences in behavior, group dynamics, theory x and y, Hawthorne experiment, morale, motivation, working environmental conditions, industrial fatigue.

TEXT BOOKS:
1. O. P. Khanna (2004), *Industrial Engineering and Management*, Dhanpat Rai, New Delhi.

REFERENCE BOOKS:
1. Stoner, Freeman (2005), *Gilbert, Management*, 6th edition, Pearson Education, New Delhi.
2. Panner Selvam (2004), *Production and Operations Management*, Prentice Hall of India, New Delhi.
3. Ralph M. Barnes (2004), *Motion and Time Studies*, John Wiley and Sons.
4. L. S. Srinath (2000), *PERT / CPM*, affiliate East-West Press, New Delhi.
5. Gary Dessler (2002), *Human Resource Management*, Pearson Education Asia, India.

BUSINESS INTELLIGENCE AND ANALYTICS
Professional Elective - II
(Common to CSE & IT)

Course Code: **A1533**

L	T	P	C
3	1	-	4

This Course is designed in collaboration with Infosys Technologies Limited.

UNIT - I
INTRODUCTION TO BUSINESS INTELLIGENCE: Introduction to digital data and its types – structured, semi-structured and unstructured, Introduction to OLTP and OLAP (MOLAP, ROLAP, HOLAP), BI Definitions & Concepts, BI Framework, Data Warehousing concepts and its role.

UNIT - II
ASPECTS OF BUSINESS INTELLIGENCE: BI Infrastructure Components – BI Process, BI Technology, BI Roles & Responsibilities, Business Applications of BI, BI best practices.

UNIT - III
BASICS OF DATA INTEGRATION: Concepts of data integration, needs and advantages of using data integration, introduction to common data integration approaches, Meta data – types and sources, Introduction to data quality, data profiling concepts and applications, introduction to ETL using Pentaho data Integration (formerly Kettle).

UNIT - IV
INTRODUCTION TO MULTI-DIMENSIONAL DATA MODELING: Introduction to data and dimension modeling, multidimensional data model, ER Modeling vs. multi dimensional modeling, concepts of dimensions, facts, cubes, attribute, hierarchies, star and snowflake schema, introduction to business metrics and KPIs, creating cubes using Microsoft Excel.

UNIT - V
BASICS OF ENTERPRISE REPORTING: A typical enterprise, Malcolm Baldrige – quality performance framework, balanced scorecard, enterprise dashboard, balanced scorecard vs. enterprise dashboard, enterprise reporting using MS Access / MS Excel, best practices in the design of enterprise dashboards.

TEXT BOOKS:
1. Daniel J. Power (2002), *Decision Support Systems: Concepts and Resources for Managers*, Greenwood Publishing Group, Inc, USA.
2. Roland Bouman, Jos van Dongen(2009), *Pentaho Solutions - Business Intelligence and Data warehousing With Pentaho and MySQL,* Wiley Publishing, Inc, Indiana.

REFERENCE BOOKS:
1. Jerzy Surma (2011), *Business Intelligence: Making Decisions through Data Analytics,* Business Expert Press, New Delhi, India.
2. William H. Inmon(2005)**,** *Building the Data Warehouse,* 4th edition, Wiley- India Private Limited, New Delhi.
3. Solomon Negash (2004), *Communications of the Association for Information Systems,* Volume13, USA.
4. Jiawei Han, Micheline Kamber, Jian Pei (2012), *Data Mining: Concepts and Techniques*, 3rd edition, Elsevier, United States of America.
5. David Taniar (2009), *Progressive methods* in *Data Warehousing and Business Intelligence: Concepts and Competitive Analytics,* Idea Group Inc (IGI), USA*.*
6. Rajiv Sabherwal, Irma Becerra-Fernandez (2011), *Business Intelligence: Practices, Technologies and Management,* John Wiley & Sons, USA.

GRID AND CLOUD COMPUTING
Professional Elective - II
(Common to CSE & IT)

Course Code: **A1614**

L	T	P	C
3	1	-	4

UNIT - I
INTRODUCTION: Introduction to middleware technologies and its classification.

DISTRIBUTED SYSTEM MODELS AND ENABLING TECHNOLOGIES: Scalable Computing Service over the Internet, the Age of Internet Computing, Computing Trends and New Paradigms, Internet of Things and Cyber-Physical Systems. System Models for Distributed and Cloud Computing, Clusters of Cooperative Computers, Grid Computing Infrastructures, Peer-to-Peer Network Families, Cloud Computing over the Internet. Software Environments for Distributed Systems and Clouds, Service-Oriented Architecture (SOA), Distributed Operating Systems and Software Tools, Parallel/Distributed Programming Models. *Performance, Security and Energy-Efficiency:* Performance Metrics and Scalability Analysis, Fault-Tolerance and System Availability, Network Threats and Data Integrity, Energy-Efficiency in Distributed Computing.

UNIT - II
DESIGN OF CLOUD COMPUTING PLATFORMS: Cloud Computing and Service Models; Public, Private and Hybrid Clouds, Cloud Ecosystem and Enabling Technologies, Infrastructure-as-a-Service (IaaS) Model, Platform -and Software-as-a-Service (Paas, SaaS). *Architecture Design Of Compute And Storage Clouds:* A Generic Cloud Architecture Design, Layered Cloud Architectural development, Virtualization Support and Disaster Recovery, Architectural Design Challenges. *Public Cloud Platforms*: Google Application Engine (GAE), Amazon Web Service (AWS) and Windows Azure; Public Clouds and Service Offerings, Google Application Engine (GAE), Amazon Web Service (AWS), Microsoft Windows Azure. *Inter- Cloud Resource Management:* Extended Cloud Computing Services, Resource Provisioning and Platform Deployment, Virtual Machine Creation and Management, Global Exchange of Cloud Resources. *Cloud Security and Trust Management:* Cloud Security Defense Strategies, Distributed Intrusion/Anomaly Detection, Data and Software Protection Techniques, Reputation-Guided Protection of Datacenters.

UNIT - III
SERVICE ORIENTED ARCHITECTURES: *Services and Service Oriented Architectures:* REST and Systems of Systems, Services and Web Services, Enterprise Multi-tier Architecture, Grid Services and OGSA, Other Service Oriented Architectures and Systems. *Message-Oriented Middleware:* Enterprise Bus, Publish-Subscribe Model and Notification, Queuing and Messaging Systems, Cloud and Grid Middleware applications. *Discovery, Registries, Metadata and Databases:* UDDI and Service Registries, Databases and Publish-Subscribe, Metadata catalogues, Semantic Web and Grid, Job Execution Environments and Monitoring. *Workflow in Service-Oriented Architectures:* Basic Concepts of Workflow, Workflow Standards, Workflow Architecture and Specification, Workflow Execution Engine.

UNIT - IV
CLOUD PROGRAMMING AND SOFTWARE ENVIRONMENTS: Features of Cloud and Grid Platforms; Cloud Capabilities and Platform Features, Traditional Features Common to Grids and Clouds, Data Features and Databases, Programming and Runtime Features. Parallel and Distributed Programming Paradigms; Parallel Computing and Programming Paradigms, MapReduce, Twister and Iterative MapReduce, Hadoop Library from Apache, Mapping Applications to Parallel and Distributed Systems. *Programming Support of Google App Engine:* Programming the Google App Engine, Google File System (GFS), Bigtable, Google's NOSQL system, Chubby, Google's Distributed Lock service*. Programming on Amazon AWS and Microsoft Azure:* Programming on Amazon EC2, Amazon Simple Storage Service S3, Amazon Elastic Block Store EBS and SimpleDB, Microsoft Azure programming support.

EMERGING CLOUD SOFTWARE ENVIRONMENTS: Open Source Eucalyptus and Nimbus, OpenNebula, Sector/Sphere and OpenStack, Manjrasoft Aneka Cloud and Appliances.

UNIT - V

GRID COMPUTING SYSTEMS AND RESOURCE MANAGEMENT: Grid Architecture and Service Modeling; Grid History and service families, CPU Scavenging and Virtual super computers, OGSA, Data intensive Grid service models.

GRID RESOURCE MANAGEMENT AND BROKERING: Resource Management and Job Scheduling, Grid Resource Monitoring with CGSP, Service Accounting and Economy Model, Grid Resource Brokering with Gridbus. Software and Grid Computing; Open-Source Grid Middleware Packages, The Globus Toolkit Architecture (GT4), Containers and Resource/Data Management. Grid Application Trends and security measures; Trust models for grid security enforcement, Authentication and Authorization methods, GSI. On-Line Social and Professional Networking; Online Social Network Characteristics, Graph-Theoretic Analysis of Social networks, Communities and Applications of Social Networks, *Facebook*: The World's Largest Content-Sharing Network, Twitter for Microblogging, News and Alert Services.

TEXT BOOKS:
1. Kai Hwang, Jack Dongarra, Geoffrey Fox (2011), *Distributed and Cloud Computing, From Parallel Processing to the Internet of Things*, Morgan Kaufman Publishers, India.

REFERENCE BOOKS:
1. Joshy Joseph, Craig Fellenstein(2007), *Grid Computing*, IBM Press, India.
2. Prabhu(2007), *Grid and Cluster Computing*, Prentice Hall of India, New Delhi.
3. Anthony T. Velte, Toby J. Velte, Robert Elsenpeter(2010), *Cloud Computing, A Practical Approach*, McGraw Hill Edition, New Delhi.

B. Tech. IT VIII SEMESTER

GEOGRAPHICAL INFORMATION SYSTEMS
(Professional Elective - II)

Course Code: **A1615**

L	T	P	C
3	1	-	4

UNIT - I
INTRODUCING GIS AND SPATIAL DATA: Definition - maps and spatial information -computer assisted mapping and map analysis - components of GIS - people and GIS.

MAPS AND SPATIAL DATA: Thematic characteristics of spatial data - other sources of spatial data: census, survey data, air Photos, satellite images, field data.

UNIT - II
SPATIAL AND ATTRIBUTES DATA MODELING AND MANAGEMENT: *Data quality and data standards*: Concepts - Definition - Components and assessment of data quality: Spatial entities - generalization - Raster and Vector spatial data structures - comparison of Vector and Raster Methods - Acquisition of spatial data for terrain modeling - Raster and Vector approach to digital terrain modeling - modeling network - layered approach and object - oriented approach - modeling third and fourth dimension.

PROBLEM OF DATA MANAGEMENT: Database management system - relational database model - linking spatial and attribute data - GIS database application and development.

UNIT - III
DATA INPUT: Integrated GIS database - Encoding methods of data input: keyboard, manual digitizing scanning and automatic digitizing methods, electronic data transfer.

DATA EDITING: Methods of developing and correcting errors in attributes and spatial data: reproduction, transformation and generalization - edge matching and rubber sheeting - integrated database.

UNIT - IV
DATA ANALYZING OPERATION IN GIS: Terminologies - Measurements of lengths, peimeter and area in GIS - queries - reclassification - buffering and neighborhood functions - integrated data - Raster and Vector overlay method: point-in-polygon, line-in-polygon and polygon- on-polygon - problems of Raster and Vector overlays - spatial interpolation - GIS for surface analysis - network analysis: shortest path problem, travailing problem, location allocation of resources - route tracing.

UNIT - V
GIS MODELING FOR DECISION SUPPORT: Models of spatial processes: natural and scale analogue models - conceptual models - mathematical model - models of physical and environmental processes - modeling human process - gravity model - problems related to using GIS to model spatial processes.

MAPS AS OUTPUT: Alternative cartographic outputs, non-cartographic outputs, spatial multimedia, delivery mechanism, GIS and spatial decision supports, maps as decision tools.

TEXT BOOKS:
1. Ian Haywood, Sarah Cornelius, Steve Carver (2010), *An Introduction to Geographical Information Systems*, Addison Wiley Longmont, New York.
2. Kang Tsung Chang (2008), *Introduction to Geographic Information Systems*, 4th edition, Tata McGraw Hill, New Delhi, India.

REFERENCE BOOKS:
1. Burgh P.A (1986), *Principles of geographical Information System for Land Resources Assessment*, Clarendon Press, Oxford, USA.
2. Burrough P. A, P. A McDonnell (2000), *Principles of Geographical Information systems*, Oxford University Press. London.
3. Lo. C .P. Yeung, K.W. Albert (2002), *Concepts And Techniques of Geographic Information Systems*, Prentice Hall of India Private Limited, New Delhi.

AD HOC AND SENSOR NETWORKS
(Professional Elective - II)

Course Code: **A1616**

L	T	P	C
3	1	-	4

UNIT - I

INTRODUCTION TO AD HOC NETWORKS: Characteristics of MANETs, Applications of MANETs and challenges of MANETs.

ROUTING IN ADHOC NETWORKS: Criteria for classification, Taxonomy of MANET routing algorithms, Topology based routing algorithms, Position based routing algorithms, otherion based positrouting algorithms.

UNIT - II

DATA TRANSMISSION: Broadcast storm problem, Broadcasting, Multicasting and Geocasting.

TCP OVER AD HOC: TCP protocol overview, TCP and MANETs, Solutions for TCP over Ad hoc.

UNIT - III

DATA RETRIEVAL IN SENSOR NETWORKS: Applications, Classification of sensor networks, Architecture of sensor network, Physical layer, MAC layer, Link layer, Routing layer, Transport layer, High-level application layer support, Adapting to the inherent dynamic nature of WSNs, Sensor Networks and mobile robots.

UNIT - IV

SECURITY IN WSN: Security in Ad Hoc networks, Key management, Secure routing, Cooperation in MANETs, Intrusion Detection systems.

UNIT - V

SENSOR NETWORK PLATFORMS AND TOOLS: Sensor Network Hardware, Berkeley motes, Sensor Network Programming Challenges, Node-Level Software Platforms.

OPERATING SYSTEM: Tiny OS, *Imperative Language***:** nesC, *Dataflow style language*: TinyGALS, Node-Level Simulators, ns-2 and its sensor network extension, TOSSIM.

TEXT BOOKS:
1. Carlos De Morais Cordeir, Dharma Prakash Aggarwal (2006), *Ad Hoc and Sensor Networks - Theory and Applications*, World Scientific Publishing Co. Pte. Ltd, Singapore.

REFERENCE BOOKS:
1. Feng Zhao, Leonidas Guibas(2004), *Wireless Sensor Networks: An Information Processing Approach,* Morgan Kauffman, USA.

B. Tech. IT VIII SEMESTER

MULTIMEDIA AND RICH INTERNET
(Professional Elective - II)

Course Code: **A1617**

L	T	P	C
3	1	-	4

UNIT - I
OPTIMIZATION OF ACCESS STRATEGIES: A Framework for query optimization, join queries, general queries.

INTRODUCTION TO MULTIMEDIA: Internet and Multimedia Communications, Multimedia Networks, Multimedia Applications, Multimedia Information Representation, Digitization Principles, Text, Images, Audio and Video Compression Methods, Basic Coding Methods Run Length Coding, Huffman Coding, Arithmetic Coding, Discrete Cosine Transform, Differential PCM, Motion Compensated Prediction, Video Compression, JPEG, H.261, MPEG -I Video, MPEG - 2 and 3 Video, H.263, Wavelet And Fractal Image Compression Audio Compression.

UNIT - II
MULTIMEDIA APPLICATIONS IN NETWORKS: Introduction, Application Level Framing, Audio / Video Conferencing - Session Directories, Audio / Video Conferencing, Adaptive Applications, Receiver Heterogeneity, Real time Application with Resource Reservation Video Server.

APPLICATIONS REQUIRING RELIABLE MULTICAST: White Board, Network Text Editor for Shared Text Editing, Multi Talk, Multicast File Transfer, Multimedia Applications on the World Wide Web – Multicast Web Page Sharing, Audio / Video Streams in the WWW, Interactive Multiplayer Games.

UNIT - III
WHAT IS WEB 2.0: Search, Content Networks, User Generated Content, Blogging, Social Networking, Social Media, Tagging, Social Marking, Rich Internet Applications, Web Services, Mashups, Location Based Services. XML, RSS, ATOM, JSON, and VoIP, Web 2.0 Monetization and Business Models, Future of the Web.

RICH INTERNET APPLICATIONS (RIAS) WITH ADOBE FLASH AND FLEX: Adobe flash – introduction, Flash Movie Development, Learning Flash With Hands – on Examples, Publish your Flash Movie, Creating Special Effects with Flash, Creating a Website Splash Screen.

UNIT - IV
ACTION SCRIPT, WEB SOURCES, ADOBE FLEX 2: Introduction, Flex Platform Overview, Creating a Simple User Interface, Accessing XML Data from your Application, Interacting with Server Side Applications, Customizing your User Interface, Creating Charts and Graph, Connection Independent RIAS on the Desktop – Adobe Integrated Runtime (AIR), Flex 3 Beta.

UNIT- V
AJAX ENABLED RICH INTERNET APPLICATION: Introduction, Traditional Web Applications vs Ajax Application, Rich Internet Application with Ajax, History of Ajax, Raw Ajax Example Using Xmlhttprequest Object, Using XML, Creating a Full Scale Ajax Enabled Application, Dojo Tool Kit.

TEXT BOOKS:
1. Franklin F Kuo, J. Joaquin Garcia, Wolf Gang Effelsberg (2004), *Multimedia Communications, Protocols and Applications*, Prentice Hall Publications, India.
2. Paul J Deitel and Harvey M Deitel (2009), *AJAX, Rich Internet Applications, and Web Development for Programmers*, Deitel Developer Series, Pearson Education, India.

REFERENCE BOOKS:
1. Fred Halsall (2002), *Multimedia Communications: Applications, Networks, Protocols and Standards*, Addison Wesley Publications, India.
2. Rich Tretola, Simon barber, Renaun Erickson(2007), *Professional Adobe Flex 2*, John Wiley & Sons, India.
3. Nalin K. Sharda(1999), *Multimedia Information Networking*, Prentice Hall, India.

B. Tech. IT VIII SEMESTER

SERVICE ORIENTED ARCHITECTURE
(Professional Elective - II)

Course Code: **A1618**

L	T	P	C
3	1	-	4

UNIT - I

SOA AND WEB SERVICES FUNDAMENTALS: Introducing SOA, Fundamental SOA, Common Characteristics of Contemporary SOA, Common tangible benefits of SOA, The roots of SOA, Web Services and primitive SOA, The Web Services frame work, Services, Service descriptions, Messaging.

UNIT - II

SOA AND WS--* EXTENSIONS: Web Services and Contemporary SOA (Part-I: Activity management and Composition), Message exchange patterns, Service Activity Coordination, Atomic transactions, Business Activities, Orchestration, Choreography. Web Services and Contemporary SOA (Part-II: Advanced Messaging, Metadata, and Security), Addressing, Reliable messaging, Correlation, Policies, Metadata exchange, Security, Notification and eventing.

UNIT - III

SOA AND SERVICES ORIENTATION: Principles of Service Orientation, Service Orientation and the enterprise, Anatomy of SOA, Common Principles of Service Orientation, interrelation between Principles of Service Orientation.

SERVICE LAYERS: Service Orientation and Object Orientation, Native Web Services support for principles of Service Orientation, Service Layers, Business Service Layer, Orchestration Service Layer, Agnostics Services, Service Layer Configuration Scenarios.

UNIT - IV

BUILDING SOA (PLANNING AND ANALYSIS): SOA Delivery Strategies, SOA delivery lifecycle phases, the top down strategy, the bottom up strategy, the agile strategy Service- Oriented Analysis (Part-I: Introduction) – Introduction to Service Oriented Analysis. Benefits of a Business Centric SOA. Deriving Business Services, Service Oriented Analysis(Part-II: Service Modeling) – Service Modeling, Service Modeling guidelines, Classifying Service model logic, Contrasting Service modeling approaches.

UNIT - V

BUILDING SOA (TECHNOLOGY AND DESIGN): Service Oriented Design (Part-I: Introduction) – Introduction to Service Oriented design, WSDL related XML Schema language basics, WSDL language basics, Service interface design tools, Service – Oriented Design (Part- II: SOA Composition Guidelines) – SOA composing steps, Considerations for choosing service layers, Considerations for positioning core SOA standards, Considerations for choosing SOA extensions. Service Oriented Design (part- III: Service Design) – Service Design Overview, Service Design guidelines Service Oriented Design (Part-IV: Business Process Design). WS-BPEL Extensions, WS Coordination overview, Service Oriented Business process Design. Fundamental WS- * extensions, SOA Platforms – SOA platform basics, SOA support in J2EE and .NET, Integration considerations.

TEXT BOOKS:
1. Thomas Erl (2005), *Service Oriented Architecture – Concepts, Technology and Design*, Pearson Education, South Asia.

REFERENCE BOOKS:
1. Jeff Davies & others (2008), *The Definitive guide to SOA*, Dreamtech, India.
2. N. M. Josuttis (2007), *SOA in Practice*, SPD, O'Reilly Media, Inc, India.
3. Shankar. K(2008) , SOA for Enterprise Applications, Wiley India Edition, India.
4. Eric Newcomes, Greg Lomow (2005), *Understanding SOA with Web Services*, Pearson Education, India.

GAME DEVELOPMENT USING CUDA
Professional Elective – III
(Common to CSE & IT)

Course Code: **A1539**

L	T	P	C
3	1	-	4

UNIT - I

INTRODUCTION AND HISTORY: GPUs as Parallel Computers, Architecture of a Modem GPU, Why More Speed or Parallelism, Parallel Programming Languages and Models, Overarching Goals, Evolution of Graphics Pipelines, The Era of Fixed-Function, Graphics Pipelines, Evolution of Programmable Real-Time Graphics, Unified Graphics and Computing Processors, GPGPU, An Intermediate Step, GPU Computing, Scalable GPUs, Recent Developments, Future Trends.

UNIT - II

INTRODUCTION TO CUDA: Data Parallelism, CUDA Program Structure, A Matrix-Matrix Multiplication Example, Device Memories and Data Transfer, Kernel Functions and Threading, Function declarations, Kernel launch, Predefined variables, Runtime API.CUDA Thread Organization, Using b 1 0 C k Id X and t h re a d Id x , Synchronization and Transparent Scalability, Thread Assignment, Thread Scheduling and Latency Tolerance.

UNIT - III

CUDA MEMORIES: Importance of Memory Access Efficiency, CUDA Device Memory Types, a Strategy for Reducing Global Memory Traffic, Memory as a Limiting Factor to Parallelism, Global Memory Bandwidth.

DYNAMIC PARTITIONING OF SM RESOURCES: Data Perfecting, Instruction Mix, Thread Granularity, Measured Performance.

UNIT - IV

INTRODUCTION TO OPENCL: Introduction to OPENCL, Background, Data Parallelism Model, Device Architecture, Kernel Functions, Device Management and Kernel Launch, Electrostatic Potential Map in OpenCL.

UNIT - V

GAME DESIGN AND DEVELOPMENT: Concept of Game Design and Development and case studies.

TEXT BOOKS:
1. David B Kirk, Wen Mei W Hwu (2010), *Programming Massively Parallel Processors: A Hands - on Approach*, Elsevier India Private Limited, India.

REFEERENCE BOOKS:
1. Jason Sanders, Edward Kandrot (2010), Cuda by Example: An Introduction to General-Purpose GPU Programming, Addison-Wesley Professional, USA.
2. Steve Rabin (2010), Introduction to Game Development, Volume 2, 2nd edition, Course Technology, Cengage Learning, USA

WEB REFERENCES:
1. http://www.nvidia.co.in/object/cuda_home_new_in.html

SOFTWARE ARCHITECTURE
Professional Elective - III
(Common to CSE & IT)

Course Code: **A1540**

L	T	P	C
3	1	-	4

UNIT - I

INTRODUCTION TO SOFTWARE ARCHITECTURE: Introduction to software architecture, status of software architecture, architecture business cycle, software architectures evolution. Software processes and the architecture business cycle, features of good architecture.

ARCHITECTURE STYLES: Pipes and filters, data abstraction and object oriented organization, even-based implicit invocation, layered systems, repositories, interpreters, process control, other familiar architectures, heterogeneous architectures.

UNIT - II

SHARED INFORMATION SYSTEMS: Database integration, interpretation in software development environments, architectural structures for shared information systems.

ARCHITECTURAL DESIGN GUIDANCE: Guidance for user interface architectures, case study in inter-operability: World Wide Web.

UNIT - III

PATTERN TYPES: Architectural patterns, structural patterns, patterns for distribution, patterns for interactive systems.

FORMAL MODELS AND SPECIFICATIONS: Formalizing the architectural of a specific system, architectural styles, architectural design space, Case study: a product line development.

UNIT - IV

LINGUISTIC ISSUES: Requirements for architectural-description languages, first-class connectors, adding implicit invocation to traditional programming languages.

TOOLS FOR ARCHITECTURAL DESIGN: *Unicon:* a universal connector language, exploiting style in architectural design environments, beyond definition /use: architectural interconnection

UNIT - V

CREATING AN ARCHITECTURE: Understanding quality attributes, achieving qualities, air traffic control, documenting software architectures.

TEXT BOOKS:
1. Mary Shaw, David Garlan (1996), *Software Architecture Perspective: on an Emerging Discipline*, Prentice Hall of India, New Delhi.
2. Len Bass, Paul Elements, Rick Kazman (1998), *Software Architecture in Practice*, Pearson Education Asia, India.

REFERENCE BOOKS:
1. Garmus, Herros(1996), *Measuring the Software Process: A Practical Guide to Functional Measure*, Prentice Hall of India, New Delhi.
2. Peters, Yourdon (1981), *Software Design: Methods and Techniques,* Yourdon Press, New York.
3. Buschmann (1996), *Pattern Oriented Software Architecture*, Wiley, New Delhi.
4. Gamma et al (1995), *Design Patterns*, Pearson Education Asia, New Delhi.
5. Gamma, Shaw(1993), *An Introduction to Software Architecture*, World Scientific Publishing Company,
6. Shaw, Gamma (1996), *Software Architecture*, Prentice Hall of India, New Delhi.

B. Tech. IT VIII SEMESTER

SOFT COMPUTING
Professional Elective – III
(Common to CSE & IT)

Course Code: **A1541**

	L	T	P	C
	3	1	-	4

UNIT - I
BASICS OF ARTIFICIAL NEURAL NETWORK: Characteristics of Neural Networks, Structure and working of a biological neural network, Artificial neural network: terminology, models of neurons: McCulloch Pitts model, Perceptron model, Adaline model, topology, Basic learning laws.

FUNCTIONAL UNITS FOR ANN FOR PATTERN RECOGNITION TASK: Pattern recognition problem, Basic functional units, PR by functional units.

UNIT - II
FEEDFORWARD NEURAL NETWORKS:
SUPERVISED LEARNING - I: Perceptrons - Learning and memory, Learning algorithms, Error correction and gradient decent rules, Perceptron learning algorithms.

SUPERVISED LEARNING-II: Backpropogation, Multilayered network architectures, Back propagation learning algorithm, Example applications of feed forward neural networks.

UNIT - III
FEEDBACK NEURAL NETWORKS & SELF ORGANIZING FEATURE MAP: Introduction, Associative learning, Hopfield network, Error performance in Hopfield networks, simulated annealing, Boltzmann machine and Boltzmann learning, state transition diagram and false minima problem, stochastic update, simulated annealing, Boltzmann machine, bidirectional associative memory, bam stability analysis. Self organization, generalized learning laws, competitive learning, vector quantization, self organizing feature map, applications of self organizing feature map.

UNIT - IV
FUZZY LOGIC: Fuzzy set theory, crisp sets, operations on crisp set, fuzzy sets, fuzzy versus crisp, operations, fuzzy relations, crisp relations, properties. Fuzzy logic Application: Fuzzy Control of Blood Pressure.

UNIT - V
FUZZY LOGIC IN DATABASE AND INFORMATION SYSTEMS: Fuzzy Information, Fuzzy Logic in database Systems, Fuzzy Relational data Models, operations in Fuzzy Relational data Models, Design theory for Fuzzy Relational databases, Fuzzy information Retrieval and Web search, Fuzzy Object Oriented databases.

GENETIC ALGORITHMS: Introduction to Genetic Algorithms, Evolutionary Algorithms.

TEXT BOOKS:
1. Satish Kumar (2004), *Neural Networks A classroom Approach*, Tata McGraw Hill Publication, New Delhi.
2. Lotfi A. Zadeh(1997), *Soft computing and Fuzzy Logic*, World Scientific Publishing Co., Inc. River Edge, NJ, USA.

REFERENCE BOOKS:
1. B. Yegnanarayana (2006), *Artificial Neural Networks*, Prentice Hall of India, New Delhi, India.
2. John Yen, Reza Langari(2006), *Fuzzy Logic*, Pearson Education, New Delhi, India.
3. S. Rajasekaran, Vijaylakshmi Pari (2003), *Neural networks, Fuzzy Logic and Genetic Algorithms Synthesis and Applications*, Prentice Hall of India, New Delhi, India.

B. Tech. IT VIII SEMESTER

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INFORMATION RETRIEVAL SYSTEM
Professional Elective - III
(Common to CSE & IT)

</div>

Course Code: **A1619**

L	T	P	C
3	1	-	4

UNIT - I
INTRODUCTION TO INFORMATION RETRIEVAL SYSTEMS: Definition, Objectives, Functional Overview, Relationship to Database Management Systems, Digital Libraries and Data Warehouses.

INFORMATION RETRIEVAL SYSTEM CAPABILITIES: Search, Browse and Miscellaneous

UNIT - II
CATALOGING AND INDEXING: Objectives, Indexing Process, Automatic Indexing, Information Extraction.

DATA STRUCTURES: Introduction, Stemming Algorithms, Inverted file structures, N-gram data structure, PAT data structure, Signature file structure, Hidden Markov Models.

AUTOMATIC INDEXING: Classes of Automatic Indexing, Statistical Indexing, Natural Language, Concept Indexing, Hypertext Linkages.

UNIT - III
DOCUMENT AND TERM CLUSTERING: Introduction, Thesaurus Generation, Item Clustering, Hierarchy of Clusters.

USER SEARCH TECHNIQUES: Search Statements and Binding, Similarity Measures and Ranking, Relevance Feedback, Selective Dissemination of Information Search, Weighted Searches of Boolean Systems, Searching the Internet and Hypertext.

INFORMATION VISUALIZATION: Introduction, Cognition and Perception, Information Visualization Technologies.

UNIT - IV
TEXT SEARCH ALGORITHMS: Introduction, Software Text Search Algorithms, Hardware Text Search Systems.

INFORMATION SYSTEM EVALUATION: Introduction, Measures used in System Evaluation, Measurement Example - TREC results.

UNIT - V
MULTIMEDIA INFORMATION RETRIEVAL: Models and Languages, Data Modeling Query Languages, Indexing and Searching.

LIBRARIES AND BIBLIOGRAPHICAL SYSTEMS: Online IR Systems, OPACs, Digital Libraries.

TEXT BOOKS:
1.   Gerald J. Kowalski, Mark T. Maybury (2000), *Information Storage and Retrieval Systems: Theory and Implementation*, 2nd edition, Springer International Edition, USA.
2.   Ricardo Baeza Yates, Berthier Ribeiro Neto (2009), *Modern Information Retrieval*, Pearson Education, India.

REFERENCE BOOKS:
1.   Robert R. Korfhage (1997), *Information Storage and Retrieval,* John Wiley & Sons, India Edition, India.
2.   Frakes W. B, Ricardo Baeza Yates (1992), *Information Retrieval Data Structures and Algorithms,* Pearson Education / Prentice Hall of India, New Delhi, India.

SEMANTIC WEB AND SOCIAL NETWORKS
Professional Elective – III
(Common to CSE & IT)

Course Code: **A1620**

L	T	P	C
3	1	-	4

UNIT - I
WEB INTELLIGENCE: Thinking and Intelligent Web Applications, The Information Age, The World Wide Web, Limitations of today's Web, The Next Generation Web, Machine Intelligence, Artificial Intelligence, Ontology, Inference engines, Software Agents, Berners-Lee WWW, Semantic Road Map, Logic on the semantic Web.

UNIT - II
KNOWLEDGE REPRESENTATION FOR THE SEMANTIC WEB: Ontologies and their role in the semantic web, Ontologies Languages for the Semantic Web -Resource Description Framework(RDF) / RDF Schema, Ontology Web Language (OWL), UML, XML/XML Schema.

UNIT - III
ONTOLOGY ENGINEERING: Ontology Engineering, Constructing Ontology, Ontology Development Tools, Ontology Methods, Ontology Sharing and Merging, Ontology Libraries and Ontology Mapping.

LOGIC, RULE AND INFERENCE: Logic and interface, Monotonic and Non monotonic rules, Description logic, Interface engines, RDF Interface engine.

UNIT - IV
SEMANTIC WEB APPLICATIONS, SERVICES AND TECHNOLOGY: Semantic Web applications and services, Semantic Search, e-learning, Semantic Bioinformatics, Knowledge Base, XML Based Web Services, Creating an OWL-S Ontology for Web Services, Semantic Search Technology, Web Search Agents and Semantic Methods,

UNIT - V
SOCIAL NETWORK ANALYSIS AND SEMANTIC WEB: What is social Networks analysis, development of the social networks analysis, Electronic Sources for Network Analysis - Electronic Discussion networks, Blogs and Online Communities, Web Based Networks. Building Semantic Web Applications with social network features.

TEXT BOOKS:
1.   Berners Lee, Godel, Turing, H. Peter Alesso Craig F. Smith (2009), *Thinking on the Web,* Wiley interscience.
2.   Peter Mika (2007), *Social Networks and the Semantic Web,* Springer, USA.

REFERENCE BOOKS:
1.   J. Davies, Rudi Studer, Paul Warren (2006), *Semantic Web Technologies, Trends and Research in Ontology Based Systems,* John Wiley & Sons, England.
2.   Liyang Yu (2007), Introduction to the *Semantic Web and Semantic Web Services,* Chapman & Hall / CRC , USA.
3.   Heiner Stuckenschmidt, Frank Van Ilarmelen (2005), *Information sharing on the semantic Web*, Springer Publications, New York.

B. Tech. IT VIII SEMESTER

NETWORK MANAGEMENT SYSTEM
(Professional Elective - III)

Course Code: **A1621**

L	T	P	C
3	1	-	4

UNIT - I

DATA COMMUNICATIONS AND NETWORK MANAGEMENT OVERVIEW: Analogy of Telephone Network Management, Communications protocols and Standards, Case Histories of Networking and Management, Challenges of Information Technology Managers, Network Management: Goals, Organization, and Functions, Network and System Management, Network Management System Platform, Current Status and future of Network Management.

UNIT - II

SNMPV1 NETWORK MANAGEMENT: Organization and Information and Information Models.
MANAGED NETWORK: Case Histories and Examples, The History of SNMP Management, The SNMP Model, The Organization Model, System Overview, The Information Model.
SNMPV1 NETWORK MANAGEMENT: Communication and Functional Models. The SNMP Communication Model, Functional model.
SNMP MANAGEMENT: SNMPV2: Major Changes in SNMPv2, SNMPv2 System Architecture, SNMPv2. Structure of Management Information, the SNMPv2 Management Information Base, SNMPv2 Protocol, Compatibility With SNMPv1.

UNIT - III

SNMP MANAGEMENT: *RMON:* What is Remote Monitoring? , RMON SMI and MIB, RMON1, RMON2, ATM Remote Monitoring, a Case Study of Internet Traffic Using RMON.

TELECOMMUNICATIONS MANAGEMENT NETWORK: Why TMN?, Operations Systems, TMN Conceptual. Model, TMN Standards, TMN Architecture, TMN Management Service Architecture, an Integrated View of TMN, Implementation Issues.

UNIT - IV

NETWORK MANAGEMENT TOOLS AND SYSTEMS: Network Management Tools, Network Statistics Measurement Systems, History of Enterprise Management, Network Management systems, Commercial Network management Systems, System Management, Enterprise Management Solutions.

UNIT - V

WEB BASED MANAGEMENT: NMS with Web Interface and Web-Based Management, Web Interface to SNMP Management, Embedded Web-Based Management, Desktop management Interface, Web-Based Enterprise Management, WBEM: Windows Management Instrumentation, Java management Extensions, Management of a Storage Area Network, Future Directions.

TEXT BOOK

1.   Mani Subrahmanian (1999), *Network Management, Principles and Practice*, Pearson Education, India.

REFERENCE BOOKS

1.   Mark Burges (2004), *Principles of Network System Administration, 2nd Edition,* Wiley Dreamtech, India.
2.   Stephen B. Morris (2003)*, Network management, Mibs and Mpls: Principles, Design and Implementation*, Pearson Education India, New Delhi, India.

B. Tech. IT VIII SEMESTER

SYSTEMS ANALYSIS AND DESIGN LABORATORY

Course Code: **A1542**

L	T	P	C
-	-	6	2

For Experiments 1 – 10, do the followings:

I.   Prepare the SRS document. You have to identify the appropriate requirements for each problem.

II.   Draw the Context flow diagrams, level 1 and level 2 DFDs, using any CASE tool.

III.   Draw the Structure charts, using any CASE tool.

IV.   Develop the corresponding software using C with a user friendly GUI and appropriate Database.

LIST OF EXPERIMENTS:

1.   Develop a Library Information System for a technological University.

2.   Develop a software for student registration in a technological University.

3.   Develop a software for hall management of your Institute.

4.   Develop a software for the Guesthouse automation of your Institute.

5.   Develop a software for automating various bookkeeping activities of the student's cooperative store of your Institute.

6.   Develop the Student's Academic Record Management Software of your Institute.

7.   Develop a word processing software with some limited number of facilities such as making bold, italics, underline, cut, copy and paste etc.

8.   Develop a graphics editor software package, using which one can create / modify several common types of graphics entities.

9.   Develop a software for automating the various activities associated with developing a CASE tool for structured software analysis.

10.   Develop a software for automating various activities of the department offices of your Institute.

B. Tech. IT VIII SEMESTER

TECHNICAL SEMINAR

Course Code: **A1622**   **L   T   P   C**

                                                                                                      -   -   6   2

1.   OBJECTIVE:

Seminar is an important component of learning in an Engineering College, where the student gets acquainted with preparing a report & presentation on a topic.

2.   PERIODICITY / FREQUENCY OF EVALUATION: Twice

3.   PARAMETERS OF EVALUATION:

1.   The seminar shall have two components, one chosen by the student from the course-work without repetition and approved by the faculty supervisor. The other component is suggested by the supervisor and can be a reproduction of the concept in any standard research paper or an extension of concept from earlier course work.

2.   The two components of the seminar are distributed between two halves of the semester and are evaluated for 50 marks each. The average of the two components shall be taken as the final score.

3.   The students shall be required to submit the rough drafts of the seminar outputs within one week of the commencement of the class work.

4.   Supervisor shall make suggestions for modification in the rough draft. The final draft shall be presented by the student within a week thereafter.

5.   Presentation schedules will be prepared by different Departments in line with the academic calendar.

The Seminars shall be evaluated in two stages as follows:

A.   Rough draft

In this stage, the student should collect information from various sources on the topic and collate them in a systematic manner. He/ She may take the help of the concerned supervisor.

The report should be typed in "MS-Word" file with "calibri" font, with font size of 16 for main heading, 14 for sub-headings and 11 for the body text. The contents should also be arranged in Power Point Presentation with relevant diagrams, pictures and illustrations. It should normally contain 18 to 25 slides, consisting of the followings:

1.	Topic, name of the student & guide	1 Slide
2.	List of contents	1 Slide
3.	Introduction	1 - 2 Slides
4.	Descriptions of the topic (point-wise)	7 - 10 Slides
5.	Images, circuits etc.	6 - 8 Slides
6.	Conclusion	1 - 2 Slides
7.	References/Bibliography	1 Slide

The soft copy of the rough draft of the seminar presentation in MS Power Point format along with the draft Report should be submitted to the concerned supervisor, with a copy to the concerned HOD within 30 days of the commencement of class work.

The evaluation of the Rough draft shall generally be based upon the following.

1.	Punctuality in submission of rough draft and discussion	2 Marks
2.	Resources from which the seminar have been based	2 Marks
3.	Report	3 Marks
4.	Lay out, and content of Presentation	3 Marks
5.	Depth of the students knowledge in the subject	5 Marks
	Total	15 Marks

After evaluation of the first draft the supervisor shall suggest further reading, additional work and fine tuning, to improve the quality of the seminar work.

Within 7 days of the submission of the rough draft, the students are to submit the final draft incorporating the suggestions made by the supervisor.

B.   Presentation:

After finalization of the final draft, the students shall be allotted dates for presentation (in the designated seminar classes) and they shall then present it in presence students, supervisor, faculties of the department and at least one faculty from some department / other department.

The student shall submit 3 copies of the Report neatly bound along with 2 soft copies of the PPT in DVD medium. The students shall also distribute the title and abstract of the seminar in hard copy to the audience. The final presentation has to be delivered with 18-25 slides.

The evaluation of the Presentation shall generally be based upon the following.

1.	Contents	10 Marks
2.	Delivery	10 Marks
3.	Relevance and interest the topic creates	5 Marks
4.	Ability to involve the spectators	5 Marks
5.	Question answer session	5 Marks
	Total	35 Marks

4.   WHO WILL EVALUATE?
The presentation of the seminar topics shall be made before an internal evaluation committee comprising the Head of the Department or his/her nominee, seminar supervisor and a senior faculty of the department / other department.

B. Tech. IT VIII SEMESTER

<div align="center">

COMPREHENSIVE VIVA

</div>

Course Code: **A1623**

L   T   P   C
-   -   -   **2**

1.   **OBJECTIVE:**

- To enable the examiners to assess the candidate's knowledge in his or her particular field of learning.

- To test the student's awareness of the latest developments and relate them to the knowledge acquired during the classroom teaching.

2.   **PARAMETERS OF EVALUATION:**

Subject Knowledge	Current Awareness	Career Orientation	Communication Skills	Total
20	10	10	10	50

3.   **WHO WILL EVALUATE?**

The comprehensive Viva will be conducted by a committee comprising Head of the Department or his/her nominee, two senior faculty of the respective department and an external examiner from outside the college. The comprehensive viva shall be evaluated for 50 marks at the end of VIII semester. A minimum of 40% of maximum marks shall be obtained to earn the corresponding credits.

4.   **PERIODICITY / FREQUENCY OF EVALUATION:**   **Once**

5.   **PEDAGOGY:**

- The viva will be held on a face to face basis.

- The students will be expected to answer the questions related to latest developments and all courses taken till date.

- Viva voce will be conducted within week before the beginning of midterm examinations. However, in exceptional circumstances it can be scheduled immediately after the end of midterm examinations.

- Students will have to make themselves available on the date of the viva voce.

B. Tech. IT VIII SEMESTER

<div align="center">

MINI PROJECT / PROJECT WORK

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Course Code: **A1624/ A1613**   L   T   P   C

                                                                     -       -   12   8

1.   OBJECTIVE:

The main objective of the Project Work is for the students to learn and experience all the major phases and processes involved in solving "real life engineering problems".

2.   EXPECTED OUTCOME:

The major outcome of the B. Tech project must be well-trained students. More specifically students must have acquired:

- •   System integration skills
- •   Documentation skills
- •   Project management skills
- •   Problem solving skills

3.   PROJECT SELECTION:

Projects are suggested by the faculty, with or without collaboration with an industry. All faculty are to suggest projects. Students are also encouraged to give project proposals after identifying a faculty who would be willing to supervisor the work. A Project brief is to be given by the faculty to the group defining the project comprehensively.

All B. Tech major projects are to be done in the Institute. For industry specified projects, students will be permitted to spend 1-2 weeks in the industry on recommendation by the supervisor. The number of students per batch should be between 2 and 4. If more number of students is really needed, the project may be split into functional modules and given to subgroups.

4.   WHO WILL EVALUATE?

The end semester examination shall be based on the report submitted and a viva-voce exam for 150 marks by committee comprising of the Head of the Department, project supervisor and an external examiner.

5.   EVALUATION:

The basic purpose is to assess the student competencies with regard to his project work. More specifically to assess the student's individual contribution to the project, to establish the level of understanding of basic theoretical knowledge relevant to the project and to ensure that the student has good understanding and appreciation of design and development decisions taken in the course of the project. It is desirable that all faculty members are present for the evaluations as this is a platform to get to know the student projects and to motivate the students to do good projects. The faculty should adopt a clear and consistent pattern of asking questions from general to specific aspects of the project. The presentation and evaluation is open to other students of the department.

The project work shall be evaluated for 200 marks out of which 50 marks for internal evaluation and 150 marks for end-semester evaluation. The evaluation shall be done on the following basis

Semester VII	Semester VIII
Preliminary Evaluation - 10 marks	Design Evaluation II - 25 marks
Design Evaluation I - 15 marks	Final Evaluation – 150 marks

6.   GUIDELINES FOR THE PREPARATION OF B. TECH PROJECT REPORTS

6.1.   Project reports should be typed neatly only on one side of the paper with 1.5 or double line spacing on a A4 size bond paper (210 x 297 mm). The margins should be: Left - 1.25", Right - 1", Top and Bottom - 0.75".

6.2. The total number of reports to be prepared are:
- One copy to the department
- One copy to the concerned guide(s)
- One copy to the candidate.

6.3. Before taking the final printout, the approval of the concerned guide(s) is mandatory and suggested corrections, if any, must be incorporated.

6.4. For making copies dry tone Xerox is suggested.

6.5. Every copy of the report must contain
- Inner title page (White)
- Outer title page with a plastic cover
- Certificate in the format enclosed both from the college and the organization where the project is carried out.
- An abstract (synopsis) not exceeding 100 words, indicating salient features of the work.

6.6. The organization of the report should be as follows:

1. Inner title page 2. Abstract or Synopsis 3. Acknowledgments 4. Table of Contents 5. List of table & figures (optional)	Usually numbered in roman

6.7 Chapters (to be numbered) containing Introduction, which usually specifies the scope of work and its importance and relation to previous work and the present developments, Main body of the report divided appropriately into chapters, sections and subsections.
- The chapters, sections and subsections may be numbered in the decimal form for e.g. Chapter 2, sections as 2.1, 2.2 etc., and subsections as 2.2.3, 2.5.1 etc.
- The report should be typed in "MS-Word" file with "calibri" font. The chapter must be left or right justified (font size 16). Followed by the title of chapter centered (font size 18), section/subsection numbers along with their headings must be left justified with section number and its heading in font size 16 and subsection and its heading in font size 14. The body or the text of the report should have font size 11.
- The figures and tables must be numbered chapter wise for e.g.: Fig. 2.1 Block diagram of a serial binary adder, Table 3.1 Primitive flow table, etc.
- The last chapter should contain the summary of the work carried, contributions if any, their utility along with the scope for further work.

6.8. **Reference OR Bibliography:** The references should be **numbered serially** in the order of their occurrence in the text and their numbers should be indicated within square brackets for e.g. [3]. The section on references should list them in serial order in the following format.
1. For textbooks - A.V. Oppenheim and R.W. Schafer, Digital Signal Processing, Englewood, N.J., Prentice Hall, 3 Edition, 1975.
2. For papers - Devid, Insulation design to combat pollution problem, Proc of IEEE, PAS, Vol 71, Aug 1981, pp 1901-1907.

6.9. Only SI units are to be used in the report. Important equations must be numbered in decimal form for e.g. **V = IZ** .... **(3.2)**

6.10. All equation numbers should be right justified.

6.11. The project report should be brief and include descriptions of work carried out by others only to the minimum extent necessary. Verbatim reproduction of material available elsewhere should be strictly avoided. Where short excerpts from published work are desired to be included, they should be within quotation marks appropriately referenced.

6.12. Proper attention is to be paid not only to the technical contents but also to the organization of the report and clarity of the expression. Due care should be taken to avoid spelling and typing errors. The student should note that report-write-up forms the important component in the overall evaluation of the project

6.13.   Hardware projects must include: the component layout, complete circuit with the component list containing the name of the component, numbers used, etc. and the main component data sheets as Appendix. At the time of report submissions, the students must hand over a copy of these details to the project coordinator and see that they are entered in proper registers maintained in the department.

6.14.   Software projects must include a virus free disc, containing the software developed by them along with the read me file. Read me file should contain the details of the variables used, salient features of the software and procedure of using them: compiling procedure, details of the computer hardware/software requirements to run the same, etc. If the developed software uses any public domain software downloaded from some site, then the address of the site along with the module name etc. must be included on a separate sheet. It must be properly acknowledged in the acknowledgments.

6.15.   Sponsored Projects must also satisfy the above requirements along with statement of accounts, bills for the same dully attested by the concerned guides to process further, They must also produce NOC from the concerned guide before taking the internal viva examination.

6.16.   The reports submitted to the department/guide(s) must be hard bounded, with a plastic covering.

6.17.   Separator sheets, used if any, between chapters, should be of thin paper

VARDHAMAN COLLEGE OF ENGINEERING

(Autonomous)

Shamshabad – 501 218, Hyderabad, Andhra Pradesh, India

Department of …………………………………………………..

CERTIFICATE

Certified that the project work entitled ………………………………………….. carried out by Mr./Ms. …………………………………….., Roll Number …………………..………, a bonafide student of ………………………………………in partial fulfillment for the award of **Bachelor of Technology** in ………….…………….………………………………………… of the Jawaharlal Nehru Technological University, Hyderabad during the year ……………………….. It is certified that all corrections / suggestions indicated for Internal Assessment have been incorporated in the Report deposited in the departmental library. The project report has been approved as it satisfies the academic requirements in respect of Project work prescribed for the said Degree.

Name & Signature of the Guide   **Name Signature of the HOD**   **Signature of the Principal**

External Viva

Name of the examiners   Signature with date
1.
2.

Certificate issued at the Organization where the project was carried out
(On a separate sheet, If applicable)

NAME OF THE INDUSTRY / ORGANIZATION, Address with pin code

CERTIFICATE

Certified that the project work entitled ……………………………………………………………………………….. carried out by

Mr./Ms . …………………………………………., Roll Number…………………………, a bonafide student of

…………………………………………………………………….in partial fulfillment for the award of **Bachelor of Technology** in

……………………………………..………………………………… of the Jawaharlal Nehru Technological University, Hyderabad

during the year ……………………….. It is certified that, he/she has completed the project satisfactorily

Name & Signature of the Guide   **Name & Signature of the Head of Organization**

7.   **DISTRIBUTION OF MARKS FOR B.TECH DISSERTATION EVALUATION**

S No.	Particulars	Max. Marks
1	Relevance of the subject in the present context	10
2	Literature Survey	10
3	Problem formulation	20
4	Experimental observation / theoretical modeling	10
5	Results – Presentation & Discussion	20
6	Conclusions and scope for future work	10
7	Overall presentation of the Thesis / Oral presentation	40
8	Project Report Writing	30
Total Marks		**150**