PREREQUISTE: NIL

OBJECTIVES:

   The student should be conversant with the evolution of environmentalism and the importance of environmental studies, various natural resources and the current threats to their sustainability, significance and protection of bio diversity and various forms of environmental degradation and international conventions and protocols for the protection of environment and concept of sustainability.

UNIT – I Introduction to Environment and Ecosystem   9

Definition, scope and importance of environment – need for public awareness. Atmosphere – composition of atmosphere (troposphere, stratosphere, mesosphere and thermosphere) Biosphere – Hydrosphere – Lithosphere. Concept of ecosystem – structure and functions of ecosystem- producers, consumers and decomposers - Energy flow –Ecological Succession-Food chains-Food webs- Ecological pyramids-Introduction, types, characteristic features -structures and function of forest, grassland and aquatic ecosystems (ponds and rivers) - Case Studies in current scenario.

UNIT - II Natural Resources and Biodiversity   9

Forest resources-Water resources-Mineral resources-Food resources-Energy resources-Land resources. Introduction to biodiversity definition: genetic, species and ecosystem diversity – biogeographically classification of India – value of biodiversity: consumptive use, productive use, social, ethical, aesthetic and option values – Biodiversity at global, national and local levels – India as a mega-diversity nation – hot-spots of biodiversity – threats to biodiversity: habitat loss, poaching of wildlife, man-wildlife conflicts – endangered and endemic species of India – conservation of biodiversity: In-situ and ex-situ conservation of biodiversity.

UNIT -III   Environmental Pollution   9

Definition – causes, effects and control measures of: (a) Air pollution (b) Water pollution (c) Soil pollution (d) Marine pollution (e) Noise pollution (f) Thermal pollution (g) Nuclear hazards – solid waste management: causes, effects and control measures of municipal solid wastes – role of an individual in prevention of pollution – pollution case studies – disaster management: floods, earthquake, cyclone and landslides.

UNIT –IV   Social Issues, Human Population and the Environment   9

From unsustainable to sustainable development – urban problems related to energy – water conservation, rain water harvesting, watershed management – resettlement and rehabilitation of people; its problems and concerns, case studies role of non-governmental organization environmental ethics: Issues and possible solutions – climate change, global warming, acid rain, ozone layer depletion, nuclear accidents and holocaust, case studies. – Wasteland reclamation – consumerism and waste products – environment protection act –-environmental legislation- central and state pollution control boards.

Definition of sustainability -Components of sustainability History and emergence of the concept of sustainable development – Our Common Future - Objectives of Sustainable Development - Millennium Development Goals - Environment and Development linkages – Globalization and environment - Sustainability indicators-Hurdles to Sustainability

TOTAL HOURS:45

COURSE OUTCOMES:

CO1: The students will demonstrate relationship among environment and ecosystem

CO2: The students will identify and analyze effects of pollution on ecosystem

CO3: The students will identify and analyze social issues and sustainable development.

TEXT BOOK:

1) Gilbert M.Masters, 'Introduction to Environmental Engineering and Science', 2nd Edition, Pearson Education (2004).
2) Benny Joseph, 'Environmental Science and Engineering', Tata McGraw- Hill, New Delhi, (2006).

REFERENCES

1) R.K. Trivedi, 'Handbook of Environmental Laws, Rules, Guidelines, Compliances and Standards', Vol. I and II, Enviro Media.
2) Cunningham, W.P. Cooper, T.H. Gorhani, 'Environmental Encyclopedia', Jaico Publ., House, Mumbai, 2001.
3) Dharmendra S. Sengar, 'Environmental law', Prentice hall of India PVT LTD, New Delhi, 2007.
4) Rajagopalan, R, 'Environmental Studies-From Crisis to Cure', Oxford University Press (2005)

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315CST03	DIGITAL ELECTRONICS	L	T	P	C
		3	0	0	3

PREREQUISITES: NIL

COURSE OBJECTIVE(S):

- To introduce basic postulates of Boolean algebra and shows the correlation between Boolean expressions
- To outline the formal procedures for the analysis and design of combinational circuits and sequential circuits
- To introduce the concept of memories and programmable logic devices.
- To illustrate the concept of synchronous and asynchronous sequential circuits

UNIT I BOOLEAN ALGEBRA AND LOGIC GATES 9

Review of binary number systems - Binary arithmetic – Binary codes – Boolean algebra and theorems - Boolean functions – Simplifications of Boolean functions using Karnaugh map and tabulation method – Logic gates

UNIT II COMBINATIONAL LOGIC 9

Combinational circuits – Analysis and design procedures - Circuits for arithmetic operations – Code conversion -Decoders and encoders - Multiplexers and demultiplexers–Comparator.

UNIT III SYNCHRONOUS AND ASYNCHRONOUS SEQUENTIAL LOGIC 9

Sequential circuits – Flip flops – Analysis and design procedures - State reduction and state assignment - Shift registers – Counters Analysis and design of asynchronous sequential circuits - Reduction of state and flow tables – Hazards-Hazard free realizations.

UNIT IV PROGRAMMABLE LOGIC DEVICES, MEMORY AND LOGIC FAMILIES 9

Memories: ROM, PROM, EPROM, PLA, PLD, FPGA, Introduction to Flash Memory. Digital Logic Families: TTL, ECL, CMOS.

UNIT V VHDL 9

VHDL program structure-operators-Data flow modeling-Design of combinational and sequential circuits (Examples: Adders, subtractors, multiplexers/ Demultiplexers, Encoder/ Decoder, FF's, Counters)

TOTAL HOURS: 45

COURSE OUTCOMES

- Solve the Postulates of Boolean algebra using different techniques
- Designing the Combinational and sequential circuits
- Applying the concept of synchronous and asynchronous circuit
- Knowledge in VHDL for VLSI Design

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TEXT BOOK (S):

1) M.Morris Mano, "Digital Design", 3rd edition, Pearson Education, 2007.

REFERENCE(S):

1) Charles H.Roth, Jr. "Fundamentals of Logic Design", 4th Edition, Jaico Publishing House, Latest Edition.
2) Donald D.Givone, "Digital Principles and Design", Tata McGraw-Hill, 2007
3) Charles H.Roth,Lizy Kurian John,"Digital System Design using VHDL"2nd edition PWS Publishing Company,2008

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315CST04	Data Structures	L	T	P	C
		3	0	0	3

PREREQUISITES: OBJECT ORIENTED PROGRAMMING

OBJECTIVES

- Learn the Linear Data Structures like Lists, Stacks, and Queues.
- Be Familiar with Non - Linear Data Structures such as Trees, Heaps, and Balanced Trees.
- Solve Problems using Graph Data Structures.
- Develop the ability to use Sorting, Searching and Hashing algorithms efficiently.

UNIT I   LINEAR DATA STRUCTURES   9

Abstract Data Types - Linear List - Single Linked List - Circular Linked List - Doubly Linked List - Circular Doubly Linked List - Applications of Linked List - Polynomial Operations - Stack - Applications of Stack - Evaluation of Postfix Expression - Converting Infix to Postfix - Balancing Parenthesis - Queue - Representation of Queues - Application of Queues - **CPU Scheduling**

UNIT II   TREES AND HEAPS   9

Tree - Binary Tree - Representation of Linked List - Linear and Linked List Implementation - Tree Traversals - Expression Trees - Binary Search Tree - Operations on Binary Search Tree - Heaps - Operations of Heaps - Threaded Binary Trees. Priority Queues - Binary Heap - **Leftist Heap - Binomial Queues.**

UNIT III   BALANCED TREES   9

AVL Trees - Splay Trees - Top-down Splay - Red-Black Trees - B-Tree - **B+ Trees - k-D Trees**

UNIT IV   GRAPHS   9

Representation of Graphs - Breadth First Search - Depth First Search - Application of Graph Structures: Shortest Path Problem: **Floyd Warshall - Bellman Ford** - Dijkstra's Algorithm - Topological Sorting - Minimum Spanning Trees: Prim's Algorithm - Kruskal's Algorithm.

UNIT V SORTING, SEARCHING AND HASH TECHNIQUES   9

Sorting Algorithms - Insertion Sort - Selection Sort - Shell Sort - Bubble Sort - Quick Sort - Merge Sort - Radix Sort - Searching: Linear Search - Binary Search Hashing: Hash Functions - Separate Chaining - Open Addressing - Rehashing - Extendible Hashing.

Total Hours: 45

COURSE OUTCOMES:

At the end of the course the students are able to

CO1: Implement various Abstract Data Types to Solve Real life Problems by using Linear Data Structures.

CO2: Apply the different Non-Linear Data Structures to Problem Solutions.

CO3: Implement graph data structures to solve problems

CO4: Apply Sorting, Searching and Hashing algorithms to the small and large data sets.

TEXT BOOKS:

1) Debasis Samanta, "CLASSIC DATA STRUCTURES", Second Edition, PHI Learning Private Limited Publishers, 2011.
2) Mark Allen Weiss, "DATA STRUCTURES AND ALGORITHM ANALYSIS IN C++", 4/E Pearson Education, 2013.
3) Ellis Horowitz, Sartaj Sahni, Dinesh Mehta, "FUNDAMENTALS OF DATA STRUCTURES IN C++", Computer Science Press, New York, 2007.

REFERENCES BOOKS:

1) Rohit Khurana, "DATA STRUCTURES AND OBJECT ORIENTED PROGRAMMING WITH C++ ", First Edition, Vikas Publishing House Pvt Ltd, 2012.
2) Richard F.Gilberg & Behrouz A.Forouzan, "DATA STRUCTURES: A PSEUDOCODE APPROACH WITH C", Second Edition, Cengage Learning Publishers.

315CSP07	DIGITAL ELECTRONICS LABORATORY	L	T	P	C
		0	0	4	3

PREREQUISITES: NIL

OBJECTIVE(S):

- To verify the digital circuits using logical IC's.
- To study the methods for simplifying Boolean expressions and designing the digital circuits practically.
- To Implement of combinational and sequential circuits

LIST OF EXPERIMENTS

1. Verification of Boolean theorems using digital logic gates
2. Design and implementation of Adder/Subtractor, Encoders/Decoders, Code Converters using basic gates.
3. Design and implementation of 4-bit binary adder / subtractor using MSI Circuits.
4. Design and implementation of parity generator / checker using basic gates and MSI Circuits
5. Design and implementation of Magnitude Comparator
6. Design and implementation of Multiplexers/Demultiplexers
7. Design and implementation of Shift registers
8. Design and implementation of Synchronous and Asynchronous counters
9. Simulation of Adder/Subtractor, using Hardware Description Language (VHDL/ Verilog HDL software required)
10. Simulation of Encoders/Decoders using Hardware Description Language (VHDL/ Verilog HDL software required)
11. Simulation of Shift Registers using HDL (VHDL/ Verilog HDL software required)
12. Simulation of Counters using HDL (VHDL/ Verilog HDL software required)

COURSE OUTCOMES

- Verification of digital circuits using logical IC's
- Simplification of Boolean expression and implementing those circuits practically
- Implementation of combinational and sequential circuits
- Programming fundamentals in VHDL

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315CSP08	DATA STRUCTURES LAB	L	T	P	C
		0	0	4	2

PREREQUISITES: OBJECT ORIENTED PROGRAMMING LAB

OBJECTIVES:

- Efficiently implement the different Linear Data Structures
- Learn and Expose Non-Linear Data Structures.
- Explains the basic algorithms for shortest paths and minimum spanning trees
- Learn to implement Sorting and Searching and hashing Algorithms.

DATA STRUCTURE USING C++:

1. Implementation of Linked List, Stack, and Queue.

2. Implementation of Applications of Linked List and Stack.

3. Implementation of Binary Search Tree.

4. Implementation of AVL Tree.

5. Implementation of Heap

6. Implementation of Shortest Path Algorithm.

7. Implementation of Minimum Spanning Tree.

8. Implementation of Sorting Algorithms.

9. Implementation of Searching Algorithms.

10. Implementation of hashing

COURSE OUTCOMES:

At the End of the course the students will be able to

CO1: Implement C++ programs for manipulating Stacks, Queues, Lists ADT with its Applications.

CO2: Apply the different Non-Linear Data Structures for Implementing Solutions to Practical

Problems.

CO3: Ability to apply and implement Graph Data Structures for Real Time Applications.

CO4: Analyze and Implement various Searching and Sorting and hashing Algorithms.

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415DMT01 **DISCRETE MATHEMATICS AND GRAPH THEORY**

L	T	P	C
3	1	0	4

OBJECTIVES:

- To understand the concept of logic and hence to construct valid mathematical arguments.
- To master combinatorics which deals with the counting principles.
- To identify the basic properties of graph and model simple applications.
- To expose the basic properties and concepts of algebraic structures such as semigroups, monoids, groups and specially lattices and also the theory of Boolean algebra.

UNIT I   LOGIC AND PROOFS   9+3

Propositional Logic – Propositional equivalences - Predicates and quantifiers – Nested Quantifiers – Rules of inference-introduction to proofs – proof methods and strategy.

UNIT II   COMBINATORICS   9+3

Mathematical induction – Strong induction and well ordering – The basics of counting - The pigeonhole principle – Permutations and combinations – Recurrence relations- Solving linear recurrence relations - generating functions – Inclusion and exclusion and applications.

UNIT III   GRAPHS   9 +3

Graphs and graph models – Graph terminology and special types of graphs – presenting graphs and graph isomorphism – connectivity – Euler and Hamilton paths.

UNIT IV   ALGEBRAIC STRUCTURES   9+3

Algebraic systems – Semi groups and monoids – Groups-Subgroups and homomorphisms – Cosets and Lagrange's theorem – Ring & Fields.

UNIT V   LATTICES AND BOOLEAN ALGEBRA   9+3

Partial ordering – Posets – Lattices as Posets – Properties of lattices-Lattices as algebraic systems – Sub lattices – direct product and Homomorphism – Some special lattices – Boolean algebra.

                                                TOTAL = 45+15=60

COURSE OUTCOMES

At the end of the course the students are able to

CO 1: Expertise the knowledge of logics helps to verify the correctness of computer Programs and to draw conclusions from scientific experiments.

CO 2: Understand and demonstrate the basic concept of an algorithm and its applications in combinatorial mathematics.

CO 3: Acquaint the graph theory concepts serves as the base for network analysis.

CO 4: Internalize the abstract algebraic structure which provides the ability to deal the Theory of sequential machines, formal languages, and syntactic analysis.

TEXT BOOKS

1. Kenneth H.Rosen, "Discrete Mathematics and its Applications", Seventh edition, Special Indian edition, Tata McGraw – Hill Pub. Co. Ltd., New Delhi, 2011.
2. T.Veerarajan, "Discrete Mathematics with Graph Theory and Combinatorics", Tata McGraw–Hill Pub. Co. Ltd, New Delhi.

REFERENCES:

1. Trembly J.P. and Manohar R, "Discrete Mathematical Structures with Applications to Computer Science", Tata McGraw–Hill Pub. Co. Ltd, New Delhi, thirtieth re-print 2007.
2. Ralph. P. Grimaldi, "Discrete and Combinatorial Mathematics: An Applied Introduction", Fourth Edition, Pearson Education Asia, Delhi, 2007.
3. Thomas Koshy, ``Discrete Mathematics with Applications", Elsevier Publications, 2006.

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415CST04	SOFTWARE ENGINEERING	L	T	P	C
		3	0	0	3

COURSE OBJECTIVES:

- Provide an overview of software engineering and software process models.
- Collect and analyze the user requirements using UML notations and diagrams.
- Understand the different design techniques and software architectural styles.
- Learn implementation standards and testing strategies.
- Know the concepts of quality control and how to ensure good quality software.

UNIT I SOFTWARE PROCESS MODELS 9

Introduction–Software Engineering Paradigm – life cycle models: The waterfall model – incremental- spiral - WINWIN spiral – evolutionary model – prototyping - object oriented - The Concurrent Development Model - Specialized Process Models - The Unified Process - System engineering – computer based system –verification –validation.

UNIT II REQUIREMENTS ENGINEERING 9

Functional and Non-Functional Requirements - User requirements, System requirements, Software Requirements Document – Requirement Engineering Process: Feasibility Studies, Requirements elicitation and analysis, requirements validation, requirements management - Modeling Notations - Requirements and Specification Languages.

UNIT III ANALYSIS AND DESIGN MODELING 9

The Analysis Concepts - Design Process and Concepts - Modular Design- Design Heuristic - Architectural Design - Data Design - User Interface Design - Real Time Software Design - System Design - Real Time Executives - Data Acquisition System - Monitoring and Control System.

UNIT IV IMPLEMENTATION & TESTING 9

Programming Standards and Procedures - Programming Guidelines – Documentation- Software testing fundamentals-Internal and external views of Testing-white box testing- basis path testing-control structure testing-black box testing- Regression Testing – Unit Testing – Integration Testing – Validation Testing – System Testing and Debugging. Case studies: Testing Tools – Selenium-Watir

UNIT V QUALITY & MAINTENANCE 9

Software Evolution - Verification and Validation - Critical Systems Validation - Metrics for Process, Project and Product - Quality Management - Process Improvement - Risk Management - Configuration Management - Software Cost Estimation.

Total Hours: 45

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COURSE OUTCOMES

At the end of the course the students are able to

CO1: Compare and analyze the various life cycle models of software process and describe the process of requirement engineering.

CO2: Prepare Software Requirement document and build requirement model then design the method for software architecture.

CO3: Formulate various implementation and testing strategies in a system.

CO4: Familiarize various quality measurements for a software system.

TEXT BOOKS

1. Roger S.Pressman, "Software Engineering: A Practitioner's Approach", 8th Edition, McGraw Hill International Edition, 2014
2. Ian Sommerville, "Software Engineering", 10th Edition, Pearson Education Asia, 2015.
3. Shari Lawrence Pfleeger and Joanne M. Atlee, "Software Engineering: Theory and Practice", 4th Edition, Pearson Education, 2010.

REFERENCES BOOKS

1. Watts S.Humphrey,"A Discipline for Software Engineering", Pearson Education, 2007.
2. James F.Peters and Witold Pedrycz,"Software Engineering, An Engineering Approach", Wiley-India, 2007.
3. Stephen R.Schach, "Software Engineering", Tata McGraw-Hill Publishing Company Limited, 2007.
4. S.A.Kelkar,"Software Engineering", Prentice Hall of India Pvt, 2007.
5. Zaigham Mahmood, Saqib Saeed: Software Engineering framework for the cloud computing Paradigms, Springer, 2013.

415CSE01   **UNIX INTERNALS**   L   T   P   C

                                                           3   0   0   3

COURSE OBJECTIVES:

- To understand the architecture and data structures of Unix Kernel
- To learn the functions and implementations of various system calls.
- To acquire knowledge on concepts of process management
- To understand the concepts of Memory management & IO

UNIT I INTRODUCTION   9

General Overview of the System: History – System structure – User perspective –Operating System Services – Assumptions about Hardware. Introduction to the Kernel Architecture of the UNIX Operating System – Introduction to System Concept - The Buffer Cache - Buffer headers – Structure of the Buffer Pool – Scenarios for Retrieval of a Buffer– Reading and Writing Disk Blocks – Advantages and Disadvantages of the Buffer Cache.

UNIT II FILE SUBSYSTEMS   9

Internal Representation of Files: Inodes – Structure of a Regular File – Directories –Conversion of a Path Name to an Inode – Super Block – Inode Assignment to a New File – Allocation of Disk Blocks.

UNIT III   SYSTEM CALLS FOR THE FILE SYSTEM   9

Open – Read – Write – File And Record Locking – Adjusting the Position of File I/O – lseek – close – File Creation – Creation of Special Files – Changing Directory – Root – Owner - Mode – stat and fstat – Pipes – dup – Mounting And Un mounting File Systems – link – unlink.

UNIT IV PROCESSES   9

Process States and Transitions – Layout of System Memory – The Context of Process- Saving the Context of a Process – Manipulation of the Process Address Space - Process Control -process Creation – Signals – Process Termination – Awaiting Process Termination – Invoking other programs – User Id of a Process – Changing the size of a Process – Shell – System Boot and the INIT Process– Process Scheduling.

UNIT V   MEMORY MANAGEMENT AND I/O   9

Memory Management Policies - Swapping – Demand Paging - The I/O Subsystem: Driver Interface – Disk Drivers – Terminal Drivers.

                                                         TOTAL: 45 PERIODS

COURSE OUTCOMES:

At the end of the course the students are able to

CO1: Identify the data structure for kernel and methods for managing the buffer cache.
CO2: Design and implement the subsystems of an operating system.
CO3: Implement the various system calls for Unix OS.
CO4: Analyse process and memory management.

TEXT BOOK:

1. Bach M.J. The Design of the Unix Operating System, Prentice Hall of India, 2011

REFERENCE BOOKS:

1. B. Goodheart, J. Cox, —The Magic Garden Explained, Prentice Hall of India, 1986.

2. S. J. Leffler, M. K. Mckusick, M. J. Karels and J. S. Quarterman., —The Design and Implementation of the 4.3 BSD Unix Operating System , Addison Wesley, 1998.

3. Robert Love, "Linux Kernel Development", III Edition, Addison Wesley, 2010, Narosa Publishers, New Delhi, 2011.

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415CSE04	FORMAL LANGUAGES AND AUTOMATA THEORY	L	T	P	C
		3	0	0	3

COURSE OBJECTIVE:

- Illustrate the basic kinds of finite automata and their capabilities.
- Devise the regular expression and context-free languages.
- Ability to describe and transform regular expressions and grammars.

UNIT I INTRODUCTION TO AUTOMATA   9

Mathematical preliminaries and notations – Central concepts of automata theory – Finite automata - Deterministic Finite Automata - Nondeterministic Finite Automata –Equivalence of DFA and NFA – Finite Automata with Epsilon transitions - Application of FA.

UNIT II REGULAR EXPRESSIONS   9

Regular languages: Regular Expressions – Finite Automata and Regular Expressions – Applications of Regular Expressions - Regular Grammars

UNIT III   PROPERTIES OF LANGUAGES   9

Properties of regular languages: Pumping lemma for regular languages – Closure properties of regular languages – Decision properties of Regular languages   - Equivalence and Minimization of Finite Automata.

UNIT IV CONTEXT FREE LANGUAGES   9

Context Free languages: Context Free Grammars – Parse Trees - Ambiguity in Grammars and languages – Applications of Context Free Grammars - Pushdown automata (PDA) – Languages of a PDA - Equivalence of PDA's and CFG's

UNIT V   PROPERTIES OF CONTEXT FREE LANGUAGES   9

Properties of Context Free Languages: Normal Forms (CNF, GNF) for Context Free Grammars - Pumping lemma for CFL's - Closure properties of CFL – Decision properties of CFL's.

TOTAL: 45 PERIODS

COURSE OUTCOMES:

At the end of the course the students are able to

CO1: Design a finite automaton to recognize a given regular language
CO2: Construct regular expressions and grammars.
CO3: Convert grammars to normal forms and eliminate ambiguities

TEXT BOOK:

1. John E. Hopcroft and Rajeev Motwani and Jeffrey D. Ullman, "Introduction to Automata Theory, Languages and Computation", third edition, Pearson Education, New Delhi, 2013.
2. Peter Linz, "An Introduction to Formal Language and Automata", fifth edition, Narosa Publishers, New Delhi, 2011.

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REFERENCE BOOKS:

1. S.N.Sivanadam , M.Janaki Meena, " Theory of Computation" , I.K.International Publishing House Pvt.Ltd, ISBN: 9789380026206, 2009.

2. Michael Sipser, "Introduction to the Theory of Computation", third edition, PWS Publications, Boston, 2013.

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415CSE05	PC HARDWARE AND TROUBLE SHOOTING	L	T	P	C
		3	0	0	3

COURSE OBJECTIVE:

- Learn the characteristics of hardware devices
- Understand the troubleshooting fundamentals of computer hardware and software
- Know the installation, assembling and configuration management of computer hardware and software
- Familiarize the students with types of problems in Hardware peripherals.

Unit I   Introduction   9
Introduction - Computer organization – Number systems and codes – Memory – Arithmetic and Logic Unit – Control unit –Instruction prefetch – Interrupts – Input/Output techniques – Device controllers - Error detection techniques – Microprocessor – Personal computer concepts – Advanced system concepts –Microcomputer concepts– Operating system – Multitasking and multiprogramming – Virtual memory – Cache memory – Modern PC and user.

Unit II   Peripheral Devices   9
Introduction – Keyboard – CRT display monitor – Printer – Magnetic storage devices – Floppy disk drive – Hard disk drive – Special types of disk drives – Mouse and trackball – Modem – Fax modem – CD ROM drive – Scanner– Digital camera – Digital versatile disk – Special peripherals.

Unit III PC Hardware Overview   9
Introduction – Hardware BIOS DOS interaction – The PC family – PC hardware – Inside the system box – Motherboard logic – Memory space – Peripheral interfaces and controllers – Keyboard interface – CRT display controller– Floppy disk controller – Hard disk controller.

Unit IV Installation and Preventive Maintenance   9
Introduction – System configuration – Pre installation planning – Installation practice – Routine checks – PC assembling and integration – BIOS setup – Engineering versions and compatibility – Preventive maintenance – Disk operating system – Virus – Data recovery.

Unit V Troubleshooting   9
Introduction – Computer faults – Nature of faults – Types of faults – Diagnostic programs and tools – Microprocessor and firmware – Programmable LSI's – Bus faults – Faults elimination process – Systematic troubleshooting – Symptoms observation and analysis – Fault diagnosis – Fault rectification – Troubleshooting levels – Serial port problems – FDC problems –HDC problems –Display adapter problems -FDD, HDD, CD-ROM problems

Total Hours:45

COURSE OUTCOMES

At the end of the course the students are able to

CO1   Identify the purpose and operation of the major components of a computer

CO2   Diagnose and correct the common failures in a computer

CO3   Install and accurately troubleshoot the device drivers

CO4   Assemble and disassemble the components of a computer

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TEXT BOOK

1.B. Govindarajalu, IBM PC Clones Hardware, Troubleshooting and Maintenance, TMH, 2008

REFERENCE BOOK

1. Jean Andrews, A+ Guide to Managing and Maintaining Your PC, Cengage Learning, 2013
2. Peter Abel, Niyaz Nizamuddin, IMB PC Assembly Language and Programming, Pearson Education, 2007
3. Michael Meyers, Introduction to PC Hardware and Troubleshooting, McGraw Hill, 2003

515PQT01	PROBABILITY AND QUEUEING THEORY	L	T	P	C
		3	1	0	4

OBJECTIVES

- To impart the knowledge of basic probabilistic theory.
- To learn one dimensional discrete and continuous probability distributions occurring in natural
- phenomena.
- To extend the probability theory to two dimensional random variable and to study the statistical measures.
- To study the classification and analysis of few discrete random processes.
- To acquire the skills to analyze queueing models.

UNIT I   PROBABILITY AND RANDOM VARIABLE   9 + 3

Axioms of probability - Conditional probability - Total probability – Baye's theorem- Random variable - Probability mass function - Probability density function - Properties - Moments - Moment generating functions and their properties, Applications of mgf.

UNIT II   PROBABILITY DISTRIBUTIONS   9 + 3

Binomial, Poisson, Geometric, Uniform, Exponential, and Normal distributions and their properties - Functions of a random variable-simple applications.

UNIT III   TWO-DIMENSIONAL RANDOM VARIABLES   9 + 3

Joint distributions – Marginal and Conditional distributions – Covariance – Correlationand Linear regression – Central limit theorem (Statement and applications only forindependent and identically distributed random variables).

UNIT IV   RANDOM PROCESSES   9 + 3

Classification – Stationary process – Poisson process - Markov process – Discreteparameter Markov chain – Chapman Kolmogorov Equations-Application problems for each process.

UNIT V   QUEUEING THEORY   9 + 3

Markovian queues – Little's formula –Models: (M/M/1): (∞/FIFO), (M/M/s): (∞/FIFO), (M/M/1): (k/FIFO), (M/M/s): (k/FIFO) – Non-Markovian Queues: Pollaczek-Khinchin formula - (M/G/1): (∞/GD).

TOTAL HOURS: 45 + 15 = 60

COURSE OUTCOMES

At the end of the course the student will be able to

CO 1: Imbibe the knowledge of basic probability improves the quality of interpretation and decision making in real time problems of uncertainty.

CO2: Learn the concept of two dimensional random variables which helps to understand and analyse the statistical measures which describesan outcome of a random experiment.

CO 3: Understand and characterize the random variable phenomenon which evolve with respect to time in a probabilistic approach.

CO 4: Construct and solve queuing models that are suitable for practical problems encountered in daily life.

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TEXT BOOKS

1. Ibe, O.C. "Fundamentals of Applied Probability and Random Processes", Elsevier, U.P., 1st Indian Reprint, 2007. (2nd edition:**eBook ISBN: 9780128010358**)
2. Gross, D., Shortle, J.F., Thompson, J.M. and Harris, C.M., Fundamentals of Queuing Theory, 4th Edition, John Wiley and Sons, New York, 2016.

REFERENCES

1. HweiHsu, "Schaum's Outline of Theory and Problems of Probability, Random Variables and Random Processes", Tata McGraw Hill, New Delhi, 9th Reprint, 2010.
2. Veerarajan.T., "Probability, Statistics and Random Processes", Tata McGraw-Hill publishing company Limited, New Delhi, 2014.
3. Kandasamy.P, Thilagavathy, K., &Gunavathi.K., "Probability, Statistics and Queueing Theory"., S.Chand& Company Ltd., New Delhi, 2014.
4. Gupta.S.C., &Kapoor,V.K., "Fundamentals of mathematical statistics", 10th edition(Reprint), Sultan Chand & Sons publishers, New Delhi, 2002.

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515CST02	Micro-Processor and Microcontrollers with Applications	L	T	P	C
		3	0	0	3

COURSE OBJECTIVES

- Summarize the architecture and assembly language programming of microprocessors
- Defend the architecture and assembly language programming of microcontrollers
- Demonstrate the concept of interrupts and interfacing with various peripherals.
- Integrate the features of a microcontroller and its timer applications.
- Justify the architectural features of 801XX with 8086 processor

UNIT I   8086 MICROPROCESSOR   9

Intel 8086 microprocessor – Architecture - Minimum and Maximum mode Configuration – Signals (Pin Configuration) - Instruction Set-Addressing Modes-Assembly Language Programming-Assembler Directives-Interrupts And Interrupt Service Routines.

UNIT II   MEMORY AND I/O INTERFACING   9

Memory interfacing and I/O interfacing with (8086) – parallel communication interface – serial communication interface – timer-keyboard/display controller – interrupt controller – DMA controller (8257).

UNIT III   8051 MICROCONTROLLERS   9

Architecture of 8051 Microcontroller (Pin Configuration) – I/O ports – memory – counters and timers- serial data I/O – interrupts.

UNIT IV   INTERFACING WITH 8051   9

Interfacing with keyboards, LEDs, 7 segment LEDs, LCDs, Interfacing with ADCs. Interfacing with DACs - Stepper Motor.

UNIT V   MICROPROCESSOR TECHNOLOGY   9

Architecture of Intel 80286,80386,80486 –Features of Pentium I and II processors

Total Hours :   45

Text Books

1. Yn-cheng Liu,Glenn A.Gibson, "Microcomputer systems: The 8086 / 8088 Family architecture, Programming and Design", second edition, Prentice Hall of India , 2006

2. Kenneth J. Ayala, 'The 8051 microcontroller Architecture, Programming and applications' second edition , Penram international.

3. Mohamed Ali Mazidi, Janice Gillispie Mazidi," The 8051 microcontroller and embedded systems using Assembly and C", second edition, Pearson education /Prentice hall of India , 2007.

4. The Intel Microprocessor Architecture, Programming and Interfacing, Barry B. Brey ,6th edition, Pearson education, 2002.

Reference Books

1. Douglas V.Hall, "Microprocessors and Interfacing: Programming and Hardware", second edition, Tata Mc Graw Hill, 2006.

2. A.K.Ray & K.M Bhurchandi, "Advanced Microprocessor and Peripherals – Architecture, Programming and Interfacing", Tata Mc Graw Hill, 2006.

3. Peter Abel, "IBM PC Assembly language and programming", fifth edition, Pearson education / Prentice Hall of India Pvt. Ltd, 2007.

Course outcomes:

- Recognize the basic Microprocessor architecture and its concepts.
- Outline the concepts of peripheral interfacing mechanisms.
- Design various assembly language programming using microprocessors and microcontroller.
- Extend the real world interfacing with microcontroller.
- Extrapolate the architectural features of 801XX with 8086 processor.

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MODELLING AND DESIGN | L | T | P | C |
|---|---|---|---|
| 3 | 0 | 0 | 3 |

COURSE OBJECTIVES:

- Understand the fundamentals of modeling and design.
- Develop the OO system modeling in terms of a state and interaction modeling
- Understand the development stages of modeling and design
- Design and development of system specific design and application modeling
- Understand the design and development of implementation modeling

UNIT - 1 INTRODUCTION, MODELING CONCEPTS, CLASS MODELING STATE MODELING   9

What is Object Orientation? What is OO development? OO themes; Evidence for usefulness of OO development; OO modeling history. Modeling as Design Technique: Modeling; abstraction; The three models. Class Modeling: Object and class concepts; Link and associations concepts; Generalization and inheritance; A sample class model; Navigation of class models; Practical tips.

Advanced object and class concepts; Association ends; N-ary associations; Aggregation; Abstract classes; Multiple inheritance; Metadata; Reification; Constraints; Derived data; Packages; Practical tips. State Modeling: Events, States, Transitions and Conditions; State diagrams; State diagram behavior; Practical tips.

UNIT - 2 ADVANCED STATE MODELING, INTERACTION MODELING   9

Advanced State Modeling: Nested state diagrams; Nested states; Signal generalization; Concurrency; A sample state model; Relation of class and state models; Practical tips. Interaction Modeling: Use case models; Sequence models; Activity models. Use case relationships; Procedural sequence models; Special constructs for activity models.

UNIT - 3 PROCESS OVERVIEW, SYSTEM CONCEPTION, DOMAIN ANALYSIS   9

Process Overview: Development stages; Development life cycle. System Conception: Devising a system concept; elaborating a concept; preparing a problem statement. Domain Analysis: Overview of analysis; Domain class model; Domain state model; Domain interaction model; Iterating the analysis

UNIT – 4 APPLICATION ANALYSIS, SYSTEM DESIGN   9

Application Analysis: Application interaction model; Application class model; Application state model; adding operations. Overview of system design; Estimating performance; Making a reuse plan; Breaking a system in to sub-systems; Identifying concurrency; Allocation of sub-systems; Management of data storage; Handling global resources; Choosing a software control strategy; Handling boundary conditions; Setting the trade-off priorities; Common architectural styles; Architecture of the ATM system as the example.

UNIT - 5 CLASS DESIGN, IMPLEMENTATION MODELING & LEGACY SYSTEMS   9

Class Design: Overview of class design; Bridging the gap; Realizing use cases; Designing algorithms; Recursing downwards, Refactoring; Design optimization; Reification of behavior; Adjustment of inheritance; Organizing a class design; ATM example. Implementation Modeling: Overview of implementation; Fine-tuning classes; Fine-tuning generalizations; realizing associations; Testing. Legacy Systems: Reverse engineering; Building the class models; Building the interaction model; Building the state model; Reverse engineering tips; Wrapping; Maintenance.

TOTAL HOURS: 45

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COURSE OUTCOMES

At the end of the course the students are able to

CO1: Apply fundamental Object Oriented (OO) modeling and design in solving complex problems and Analyze problem scenario and identify classes/ Objects, their properties and associations.

CO2: Construct various UML models (including use case diagrams, class diagrams, interaction diagrams, state chart diagrams, activity diagrams, and implementation diagrams) using the appropriate notation

CO3: Propose the appropriate strategies to incorporate standard quality parameters in the design of a system.

CO4: Construct models to show the importance of system Modeling and Design in solving complex problems.

TEXT BOOKS:

1. Michael Blaha, James Rumbaugh: Object-Oriented Modeling and Design with UML, 2nd Edition, Pearson Education, 2005.

2. Frank Buschmann, Regine Meunier, Hans Rohnert, Peter Sommerlad, Michael Stal: Pattern-Oriented Software Architecture, A System of Patterns, Volume 1, John Wiley and Sons, 2007.

REFERENCE BOOKS:

1. Grady Booch et al: Object-Oriented Analysis and Design with Applications, 3rd Edition, Pearson Education, 2007.

2. Brahma Dathan, Sarnath Ramnath: Object-Oriented Analysis, Design, and Implementation, Universities Press, 2009.

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515CST04	THEORY OF COMPUTATION	L	T	P	C
		3	1	0	4

COURSE OBJECTIVES

- Understand the Properties of formal languages and formal grammars.
- Introduce deterministic and non-deterministic finite automata.
- Learn Pushdown Automata and Context free language.
- Understand Turing machines and computing with Turing machines.
- Acquaint with the fundamentals of decidability and Reducibility.

UNIT– I   INTRODUCTION TO AUTOMATA   **9**

Sets – functions – relations – Languages– Basic Machines - Finite Automata – Basic definitions– Deterministic Finite Automata (DFA), Non-Deterministic Finite Automata (NFA) – Finite automata with Epsilon transitions –Equivalence of DFA`s and NFA`s - Applications of finite state automata.

UNIT– II   REGULAR EXPRESSIONS AND LANGUAGES   **9**

Regular languages - Regular Expressions – Finite automata and regular expressions – Properties of regular sets –Properties of Regular Language: Proving languages not to be Regular – Pumping Lemma for Regular Language, Closure properties of Regular Language, Equivalence and Minimization of Automata.

UNIT– III   CONTEXT FREE LANGUAGES AND PUSH DOWN AUTOMATA   **9**

Context Free Grammar (CFG) – Derivation trees – Ambiguity-Normal Forms, Chomsky Normal Form (CNF) and Griebach Normal Form (GNF)– Introduction to Push Down Automata (PDA) – PDA definition – Equivalence of PDA and context free language –Deterministic pushdown automata – Properties of context free languages.

UNIT– IV   TURING MACHINES   **9**

Church-Turing thesis: Turing machines - Language of a TM, TM as accepters and deciders. Programming techniques for TM -Storage in state, multiple tracks, and subroutines. Variants of Turing Machines-Universal Turing machine.

UNIT– V   DECIDABILITY AND REDUCIBILITY   **9**

Decidability: Decidable languages Halting problem: Diagonalization Method-Halting Problem is Undecidable- Reducibility: Undecidable problems from Language theory - A simple Undecidable problem: Rice Theorm - Post's Correspondence Problem (PCP) -Definition, Undecidability of PCP.

Total hours :45

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COURSE OUTCOMES:

At the end of the course student should be able to

CO1: Construct automata, regular expression for any pattern.

CO2: Design grammars and Automata (recognizers) for different language classes.

CO3: Write Context free grammar for any construct

CO4: Design Turing machines for any language and propose computation solutions using Turing Machines

CO5: Derive whether a problem is decidable or not

TEXT BOOKS:

1. John E. Hopcroft and Rajeev Motwani and Jeffrey D. Ullman, "Introduction to Automata Theory, Languages and Computation", third edition, Pearson Education, New Delhi, 2014.

2. John C. Martin, "Introduction to Languages and the Theory of Computation", Fourth Edition, Tata McGraw-Hill Education Pvt. Ltd., New Delhi, 2011.

3. Rajendra Kumar, "Theory of Automata Languages and Computation", first edition Tata McGraw-Hill Education Pvt. Ltd., New Delhi, 2010.

REFERENCE BOOKS:

1. S.N.Sivanadam , M.Janaki Meena, " Theory of Computation" , I.K.International Publishing House Pvt. Ltd, ISBN: 9789380026206, 2009.

2. Michael Sipser , "Introduction to the Theory of Computation", third edition, PWS Publications, Boston, 2013.

3. Harry R. Lewis, Chris H Papadimitriou, "Elements of the Theory of Computation", Second Edition, PHI / Pearson Education, New Delhi, 1997.

4. Peter Linz, "An Introduction to Formal Language and Automata", fifth edition, Narosa Publishers, New Delhi, 2011.

COURSE OBJECTIVES:

- Develop the code in assembly language programming.
- Test the developed code using 8086 processors and 8051 controllers.
- Demonstrate the interface peripherals with microprocessor and microcontroller
- Integrate the peripherals for real world applications.
- Design the various ALU for analysis of microprocessor and microcontroller

LIST OF EXPERIMENTS

I.   **8086 based Experiments**

   1. 16 bit arithmetic operation using 8086.
   2. Generate a Fibonacci series using 8086.
   3. Searching Largest Number and Smallest Number in an array using 8086.
   4. To generate factorial of number using 8086.
   5. String manipulation using 8086.

II.   **8051 based experiments**

   6. 8-bit arithmetic operations using 8051 microcontroller

   7. Design of simple ALU using 8051 microcontroller.
   8. Searching Largest Number and smallest number in an array using 8051.
   9. Solve the logic equations using 8051 microcontroller.

III. **Interfacing Experiments with 8086/8051**

   10. Traffic light controller

   11. Stepper motor interfacing

   12. 8279 keyboard/display controller

   13. ADC and DAC interfacing

Course Outcomes

- Generate the code for arithmetic operations in assembly language
- Generalize the developed code using 8086 processors and 8051 controllers.
- Reorganize the Interfacing peripherals with microprocessor and microcontroller
- Interpolate the peripherals for real world applications.
- Propose the various ALU for analysis of microprocessor and microcontroller

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515CSP08	MODELING AND DESIGN LABORATORY	L	T	P	C
		0	0	4	2

COURSE OBJECTIVES:

- Learn the basics of OO analysis and design skills
- Be exposed to the UML design diagrams
- Learn to map designing to coding modules
- Be familiar with the various testing techniques

List of Experiments

To develop a mini-project by following the 5 exercises listed below

1. To develop a problem statement.
2. Identify Use Cases and develop the Use Case model.
3. Identify the conceptual classes and develop a domain model with UML Class diagram.
4. Using the identified scenarios, find the interaction between objects and represent them using UML Sequence diagrams.
5. Draw relevant state charts and activity diagrams.
6. Identify the User Interface, Domain objects, and Technical services. Draw the partial layered, Logical architecture diagram with UML package diagram notation.
7. Develop and test the Technical services layer.
8. Develop and test the Domain objects layer.
9. Develop and test the User interface layer.

Suggested List of Applications

1. Fundamental of UML diagrams and notations
2. A business perspective-of-sales system
3. E-bookshop
4. Online auction system
5. Student information system
6. Software personnel management system
7. Conference Management System

COURSE OUTCOMES

At the end of the course, the student should be able to

CO 1: Use the UML analysis and design diagrams

CO 2: Apply appropriate design patterns

CO 3: Design and implement applications using OO concepts

CO 4: Validating the code and design

TOTAL HOURS: 45

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COURSE OBJECTIVES:

- To equip students of engineering and technology with effective speaking and listening skills in English.
- To help them enrich their soft skills and interpersonal skills, which will make the transition from college to workplace smoother and help them excel in their career.
- To enhance the performance of the students in the recruitment processes, self Enhancement and launching startups.

Unit I   **7**

Listening Audios and answering MCQs - Watching video clips on famous speeches, motivational videos, documentaries and answering MCQs - Listening Comprehension and TED talks.

Unit II   **10**

Prepared talk – Extempore - story knitting - Picture Talk – Brainstorming – Debates - Group Discussions - Elevator Speech - Mock HR Interviews - Story Narration – Miming - Short Skits.

Unit III   **12**

Reading Comprehension - Verbal Analogy - Classification - Alphabet Test - Logical Sequence of Words - Statement & Conclusions - Statement & Courses of Action - Situation Reaction Test - Theme Detection - Deriving Conclusions from Passages.

Unit IV   **7**

Business Letters - Email Writing (hints development) - Essay Writing - Paragraph Writing - Paraphrasing.

Unit V   **9**

Vocabulary Test (GRE, TOEFL, TOEIC & CAT Exam words) - Confused Pair of words - Contronyms - One Word Substitution - Sequencing of Sentences – Sentence correction.

Total : 45 Hours

Course Outcomes:

On completion of the course, the students shall have the ability to:

CO1: Comprehend the various strategies of listening and its significance.
CO2: Articulate their views clearly and concisely with self-confidence and persuasiveness.
CO3: Understand the prevailing practices of testing in the recruitment process by the corporate
      the institutional selection processes.
CO4: Communicate the corporate and social requirements in an impressive written mode.
CO5: Enhance their verbal skills in the screening tests competently both for recruitment and
      Pursuing higher studies as well.

Text Books:
1. Agarwal R. S., A Modern Approach to Verbal and Non-verbal Reasoning, Chand & Co.,New Delhi, 2012.
References:

1. Lingua: Essays for TOEFL/IELTS, Dreamtech Press, New Delhi, 2016.
2. Lily Mangalam, Global English Comprehension, Allied Publishers Pvt. Ltd., New Delhi, 2014.
3. Sharon Weiner Green and Ira K. Wolf, Barron's GRE, Glagotia Publications Pvt. Ltd., 18th Edition, New Delhi, 2011.
4. Mohamed Elias, R. Gupta's IELTS/TOEFL Essays, Ramesh Publishing House, 6th Edition, New Delhi, 2016.

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515CSE07	C# and .NET programming	L	T	P	C
		3	0	0	3

PREREQUISITE: Object Oriented Programming.

OBJECTIVE(S):

- To understand the fundamentals of .NET Programming
- To develop real time applications using C#

UNIT-I C# LANGUAGE FUNDAMENTALS 9

The Building Block of the .NET Platform (CLR,CTS, and CLS) – Overview of Assemblies - The Anatomy of a Simple C# Program - Defining Classes and Creating Objects - The System Console Class-Establishing Member Visibility - Default Values of Class Member Variables-Member Variable Initialization Syntax-Static Keyword - Method Parameter Modifiers - Iteration Constructs - Decision Constructs and the Relational / Equality Operators - Understanding Value Types and Reference Types-Boxing and Unboxing - Working with .NET Enumerations - Overriding Some Default Behaviors of System. Object - The System Data Types - String Data Type - .NET Array Types - Custom Namespaces.

UNIT-II OBJECT ORIENTED PROGRAMMING WITH C# 9

Understanding the C# Class Type - Reviewing the Pillars of OOP - The First Pillars: C#'s Encapsulation Services, The Second Pillar: C#'s Inheritance Support - Programming for Containment/Delegation - The Third Pillar: C#'s Polymorphic Support-C# Casting Rules - Understanding Object Lifetime - Basics of Object Lifetime - Role of Application Roots - Garbage Collection - Building Finalizable and Disposable Types. Exception Handling - Throwing a Generic Exception - Catching Exceptions.

UNIT-III INTERFACES, COLLECTIONS, DELEGATES, EVENTS AND LAMDA EXPRESSION
9

Defining Interfaces in C#-Implementing an Interface in C# - Contrasting Interfaces to Abstract Base Classes-Building Interface Hierarchies - Building Enumerable Types (IEnumerable and IEnumerator) Building Cloneable Objects (ICloneable) -Building Comparable Objects (IComparable) -The Interfaces of the System - Collections Namespace - Defining a Delegate in C# -Simplest Possible Delegate Example-Enabling Multicasting -C# Events - Lamdas Expression.

UNIT-IVDEVELOPING WINDOW APPLICATION FORMS 9

Windows Forms Types - Application Class- Functionality of the Control Class - Functionality of the Form Class- Building Windows Applications - Working with StatusStrips - Working with ToolStrips - Building an MDI Application - Basic Controls.

UNIT-V ADO.NETAND ASP.NET 9

ADO.NET Overview – Using Database Connections, Commands, The Data Reader, The DataSet Class, ASP.NET Introduction – Web Forms – ADO.NET and Data Binding-ASP.NET Features – User and Custom Controls – Master Pages- Site Navigation – Security.

TOTAL HOURS: 45

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COURSE OUTCOMES:

At the end of the course students should be able to:

   CO1: Understand anatomy of C# Programming.

   CO2: Develop Console application using object oriented concepts, advanced features in C#.

   CO3: Develop Window form application with Database connectivity.

   CO4: Build Applications using ADO.NETAND ASP.NET.

TEXT BOOKS:

1. Andrew Troelsen, "Pro C# 5.0 and the .NET 4.5 Framework" Apress, Sixth Edition,2012 ISBN: 978-1-4302-4233-8
2. Christian Nagel et al. "Professional C# 2012 with .NET 4.5", Wiley India, 2012.

REFERENCE BOOKS:

1. Herbert Schildt, "The Complete Reference: C# 4.0", Tata McGraw Hill, 2012.
2. E. Balagurusamy, "Programming in C#", Tata McGraw-Hill, 2004.
3. O`Reilly "Programming C# 5.0", O'Reilly Media ISBN: 978-1-4493-2041-6 | ISBN 10:1-4493-2041-4, October 2012.
4. Michael Schmalz "C# Database Basics" O'Reilly Media ISBN:978-1-4493-0998-5, 2012

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515CIE01 COMPUTER GRAPHICS AND MULTIMEDIA SYSTEMS

L T P C
3 0 0 3

PREREQUISITES: NIL

OBJECTIVES:

- Acquire knowledge on Display Devices and OpenGL Programming.
- Design and develop Two Dimensional Graphics.
- Learn Three Dimensional Graphics and Visible Surface Detection Methods.
- Gain knowledge on Multimedia Data Structures and Databases.
- Use Compression Techniques and Multimedia Applications in Real World Problems.

UNIT I   INTRODUCTION TO GRAPHICS

9

Overview of Display Devices-Introduction to OpenGL - Point Functions - Line Functions - Fill-Area Functions - **Character Functions** - Color Functions - Output Primitives - Line Drawing Algorithms - DDA, Bresenham's Algorithm - Circle Generating Algorithm - Mid-Point Circle Algorithm - Ellipse generating Algorithm - Mid-Point Ellipse Algorithm.

UNIT II TWO DIMENSIONAL GRAPHICS

9

Coordinate Systems - Two Dimensional Geometric Transformations -OpenGL Functions for Two Dimensional Geometric Transformation -**Two Dimensional Viewing - Two Dimensional Viewing Pipeline - Clipping Window**- OpenGL Functions for Two DimensionalViewing - Clipping Algorithms - Line Clipping Algorithms - Cohen Sutherland - **Nicholl-Lee-Nicholl** - Polygon Clipping Algorithm - Sutherland Hodgeman Algorithm - **Curve Clipping** - Text Clipping.

UNIT III THREE DIMENSIONAL GRAPHICS

9

Three Dimensional Geometric Transformations - **Affine Transformations** - OpenGL Functions for Three Dimensional Geometric Transformation- **ThreeDimensional Viewing - Three Dimensional Viewing Pipeline** - OpenGL Functions for Three DimensionalViewing - Visible Surface Detection Methods - Depth Buffer Method - A-Buffer Method - BSP Tree Method - **Ray Casting Method - Wire Frame Visibility Method** - Color Models -RGB Color Model - CMY and CMYK Color Models - HSV and HLS Color Models.

UNIT IV MULTIMEDIA BASICS

9

Components of Multimedia - Multimedia Software Tools - File Formats - Multimedia Data Structures - KD Trees - Insertion - Deletion - Search - Elements - Multimedia Databases - Design and Architecture - Text/Document Database - Precision and Recall - Retrieval Technique - Video Database - Video Segmentation - Video Standards - Audio Database - General Model - Capturing Audio Content - Indexing Audio Content.

UNIT V MULTIMEDIA APPLICATIONS

Media Compression - Lossless Compression - Compression Algorithms - Run Length - VLC - Lossless Image Compression - Introduction to Lossy Compression -**Multimedia Application Classes - Types - Virtual Reality Design - Components - Design Issues** - Multimedia Authoring Systems - **Hypermedia Application Design Consideration - User Interface Design - Augmented Reality.**

TOTAL HOURS: 45

COURSE OUTCOMES:

At the end of the course the students will be able to,

CO1: Create Interactive Computer Graphics using OpenGL.
CO2: Develop Two Dimensional Transformations and Clipping Algorithms.
CO3: Design and Apply Three Dimensional Graphics and Visible Surface Detection Methods.
CO4: Explore different Multimedia Data Structures and Databases.
CO5: Apply Compression Techniques and Multimedia Applications in Real Time Problems.

TEXTBOOKS:

1. Donald D. Hearn, M. Pauline Baker and Warren Carithers, "Computer Graphics with OpenGL", Fourth Edition, Prentice Hall, 2010.
2. V.S.Subramanian, "Principles of Multimedia Database Systems", Harcourt India Pvt Ltd., 2001
3. Prabhat K Andleigh, Kiran Thakrar, "Multimedia Systems Design", First Edition, PHI, 2008.

REFERENCES:

1. Ze-Nian Li and Mark S Drew, "Fundamentals of Multimedia", Pearson Prentice Hall, 2004.
2. Ralf Steinmetz, Klara Steinmetz, "Multimedia Computing, Communications and Applications", Pearson Education, 2009.

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515CSE09	ADVANCED JAVA PROGRAMMING	L	T	P	C
		3	0	0	3

PREREQUISITE: Java Programming

OBJECTIVES:
- To learn advanced Java programming concepts like Servlets, Session management and JDBC in Servlets.
- To develop java Beans Application in Java
- To understand the concepts of EJB and implementation of EJB
- To understand the concept of RMI and ORB
- To understand the basic concepts of JSP and javamail API

UNIT I Servlets and Session Management   9

Servlet overview – the Java web server – your first servlet – servlet chaining – server side includes- Session management – security – HTML forms – using JDBC in servlets – applet to servlet communication.

UNIT II Java Beans Application Development   9

Java Beans: The software component assembly model- The java beans development kit- developing beans – notable beans – using infobus - Glasgow developments - Application Builder tool- JAR files-Introspection-Bound Properties-Persistence-customizers - java beans API.

UNIT III Enterprise Java Beans   9

EJB: EJB architecture- EJB requirements – design and implementation – EJB session beans- EJB entity beans-EJB Clients – deployment tips, tricks and traps for building distributed and other systems – implementation and future directions of EJB-Variable in perl- perl control structures and operators – functions and scope

UNIT IV RMI and Object Request Broker   9

RMI – Overview – Developing applications with RMI: Declaring & Implementing remote interfaces-stubs & skeletons, Registering remote objects, writing RMI clients –Pushing data from RMI Servlet – RMI over Inter-ORB Protocol

UNIT V Java Server Pages and Javamail API   9

JSP –Introduction JSP-Examining MVC and JSP -JSP scripting elements & directives-Working with variables scopes-Error Pages - using Java Beans in JSP Working with Java Mail-Understanding Protocols in Javamail-Components-Javamail API-Integrating into J2EE-Understanding Java Messaging Services-Transactions

Total Hours :45

Course Outcomes:

CO1: Understand the advanced concepts of Java programming such as Servlets, Session management

and JDBC in servlets.

CO2: Design and develop java beans Application and implementation of EJB in Java

CO3: Develop and Implement the RMI and ORB protocol

CO4: Understand and deploy the application using JSP and javamail API.

TEXT BOOKS:

1. H. Schildt, 2014, Java 2 Complete Reference, 9th Edition, Tata McGraw Hill, New Delhi.
2. J. McGovern,R. Adatia,Y. Fain, 2003, J2EE 1.4 Bible, Wiley-dreamtech India Pvt. Ltd, New Delhi

REFERENCE(S):

1. K. Moss, 1999, Java Servlets, Second edition, Tata McGraw Hill, New Delhi.
2. R.Callaway,1999, Inside Servlets, Addison Wesley, Boston
3. Joseph O'Neil, 2010, Java Beans from the Ground Up, Tata McGraw Hill, New Delhi.
4. TomValesky, Enterprise Java Beans, Addison Wesley.
5. Cay S Horstmann & Gary Cornell, Core Java Vol II Advanced Features, Addison Wesley.

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515CSE10	NETWORK PROTOCOLS	L	T	P	C
		3	0	0	3

PREREQUISITES: Computer Networks

OBJECTIVES:

- Understand the basic network architecture models and its importance.
- Provide fundamental knowledge on protocols in various layers.
- Learn network security technologies and telephony protocols.
- Develop various network environment protocols.

UNIT I INTRODUCTION   9

Network Communication Architecture and Protocols: OSI Network Architecture - Definition and Overview of TCP/IP Protocols -TCP/IP Architecture Model – Other Network Architecture Models: IBM SNA, Network Protocols: Definition and Overview.

UNIT II USER SUPPORT PROTOCOLS   9

Application Layer Protocols: BOOTP – DHCP - S-HTTP - IMAP & IMAP 4 - LDAP, MIME – NAT – NNTP – NTP – Rlogin – TELNET – TFTP - Presentation Layer Protocols: LPP - Session Layer Protocols: RPC.

UNIT III TRANSPORT AND NETWORK SUPPORT PROTOCOLS   9

Transport Layer Protocols: TCP, UDP, RDP, RUDP, Network Layer Protocols: BGP, EGP, IP, IPV6, ICMP & ICMP6, IRDP, Mobile IP, Multicasting Protocols: BGMP, DVMRP, IGMP, MARS, MBGP, MPLS Protocols: MPLS, Data Link Layer Protocols: ARP, InARP, IPCP & IPv6CP, RARP.

UNIT IV SECURITY AND TELEPHONY PROTOCOLS   9

AAA Protocols: Kerberos, RADIUS, SSH, Secured Routing Protocols: IPSec, IPSecAH, IPSec ESP, IPSec IKE, IPSec ISAKMP, TLS, Voice over IP and VOIP Protocols: VOIP, RTSP, SAP, SDP, SIP, Media/CODEC: RTP, RTCP.

UNIT V NETWORK ENVIRONMENT PROTOCOLS   9

Wide Area Network and WAN Protocols: ATM, ATM layer, AAL, SONET/SDH, BISDN, ISDN, PPP, BAP, BACP, Local Area Network and LAN Protocols: Ethernet Protocol, Virtual LAN Protocols - Wireless LAN Protocols, Metropolitan Area Network and MAN Protocol: IEEE 802.16, Storage Area Network and SAN Protocols: FC & FCP, FCIP, NDMP, SCSI.

TOTAL HOURS: 45

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COURSE OUTCOME:

At the end of the course the students are able to

CO1:   Understand the basics of OSI and TCP/IP protocols.

CO2:   Analyze the various layers of network protocols.

CO3:   Acquire knowledge on network security and telephony protocols.

CO4:   Apply different network environment protocols.

TEXT BOOK:

1. Javvin, "Network Protocols", Javvin Technologies Inc , Fourth edition, 2007.

REFERENCES:

1. Behrouz A. Forouzan, "Data communication and Networking", 5th Edition, Tata McGraw-Hill, 2013.
2. Andrew S. Tanenbaum, David J. Wetherall, "Computer Networks", 5th Edition, PHI Learning, 2014.
3. William Stallings, "Data and Co mputer Communication", 9th Edition, Pearson Education, 2014.
4. Larry L Peterson, Bruce S Davie, "Computer Networks", 5th Edition, Morgan Kaufmann Publisher, 2012.
5. Prakash C Gupta, "Data Communications and Computer Networks", 2nd Edition, PHI Learning, 2013.

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515CSE11	AGENT BASED INTELLIGENT SYSTEM	L	T	P	C
		3	0	0	3

OBJECTIVES

- To study the idea of intelligent agents and search methods.
- To study about representing knowledge.
- To study the reasoning and decision making in uncertain world.
- To construct plans and methods for generating knowledge.
- To study the concepts of hybrid expert systems.

UNIT I INTRODUCTION   9

Introduction to Intelligent System (IS): An intelligent agent – **key events and history of AI/IS** – Natural language processing – Typical Intelligent Agents - Problem Solving Approach to Typical AI problems. Searching for solutions: Uniformed search strategies – Informed search strategies.

UNIT II   PROBLEM SOLVING METHODS AND KNOWLEDGE REASONING   10

Constraint Satisfaction Problems (CSP) - Optimal Decisions in Games - Alpha, Beta pruning – **First Order Predicate Logic** – **Resolution- Unification** –**Forward Chaining** -Backward Chaining - Knowledge Engineering Process.

UNIT III UNCERTAIN KNOWLEDGE AND REASONING   8

Uncertainty – Acting under uncertainty – Basic probability notation – Axioms of probability – Baye's rule – Probabilistic reasoning – **Making simple decisions.**

UNIT IV PLANNING AND LEARNING   9

Planning: **Planning problem** – **Partial order planning** – **Planning and acting in non-deterministic domains** – Learning: Learning decision trees – Knowledge in learning – Neural networks – Reinforcement learning – Passive and active.

UNIT V DEVELOPING INTELLIGENT AGENT SYSTEM   9

Agents and Multi-Agent Systems - Architectural Design: Specifying the Agent Types - Architectural Design: Specifying the Interactions - Agents, Capabilities and Processes.

Total hours : 45

COURSE OUTCOMES:

Upon successful completion of this course, the student will able to

CO1: Understand and Solve problems using search techniques: Uninformed and Informed.

CO2: Represent knowledge using propositional calculus and predicate calculus and understand forward and backward chaining, knowledge engineering process.

CO3: Solve uncertainty problems and acquire decision making capability based on reasoning.

CO 4: Analyze and design a neural network system with planning and learning strategies.

CO 5: Design intelligent agent system applications.

TEXT BOOKS

1. Stuart Russel and Peter Norvig, "Artificial Intelligence: A Modern Approach", Third Edition, Pearson Education, 2010 / PHI.
2. Lin Padgham and Michael Winikoff, "Developing Intelligent Agent Systems A practical guide", First Edition, John Wiley & sons Ltd, 2004.

REFERENCE BOOKS

1. Jerry Kaplan, "Artificial Intelligence – what everyone needs to know", first edition, oxford university press, 2016.
2. George F.Luger, 'Artificial Intelligence – Structures and Strategies for Complex Problem Solving', Sixth Edition, Pearson Education, 2009.
3. Elain Rich and Kevin Knight, 'Artificial Intelligence', Third Edition, Tata McGraw Hill, 2008.

L	T	P	C
3	1	0	3

COURSE OBJECTIVES

- Understand the phases of compiler.
- Learn the role of a parser and different ways of recognizing and parsing of tokens.
- Perceive the various storage allocation techniques.
- Acquaint how to generate and optimize the code.

UNIT I LEXICAL ANALYSIS
9

Compilers - Phases of a Compiler - Role of lexical analyzer - Lexical errors - Input Buffering - Specification of Tokens - Recognition of Tokens – A Language For Specifying Lexical Analysis.

UNIT II SYNTAX ANALYSIS
9

Role of the parser - Top Down parsing - Recursive Descent Parser - Predictive Parser - LL(1) Parser - Shift Reduce Parser - LR Parser – Operator Precedence - Construction of SLR Parsing table - LALR Parser – YACC.

UNIT III SYNTAX-DIRECTED TRANSLATION AND RUNTIME ENVIRONMENT
9

Syntax Directed Definitions – Construction of Syntax Trees – S-Attributed Definitions – L-Attributed Definitions - Source Language Issues- Storage Organization - Storage allocation – Access to Nonlocal Names – Parameter Passing.

UNIT IV INTERMEDIATE CODE GENERATION
9

Intermediate languages – Declarations – Assignment Statements –Boolean Expressions –Flow control statements – Back patching – Procedure Calls.

UNIT V CODE GENERATION AND OPTIMIZATION
9

Issues in design of a code generator – The target machine – Instruction costs – Basic Blocks and Flow Graphs - A simple code generator - DAG representation of Basic Blocks - Introduction to optimization – Peephole Optimization. Principal Sources of Optimization – Optimization of Basic Blocks –. Global Data Flow analysis.

TOTAL HOURS: 45

COURSE OUTCOMES

At the end of the course the students are able to

CO1: Recognize tokens from language specification.
CO2: Parse the generated tokens using top down and bottom up parsers.
CO3: Design semantic rules into a parser that performs attribution while parsing.
CO4: Represent the intermediate code for the source languages.
CO5: Apply the various optimization techniques.

TEXT BOOK

1. Alfred V. Aho, Monica S.Lam, Ravi Sethi, Jeffrey D.Ullman, ―Compilers: Principles, Techniques and Tools, Second Edition, Pearson Education, 2014(reprint).

REFERENCES

1. Dhamdhere D M, "Compiler Construction Principles and Practice" second edition, Macmillan India Ltd., New Delhi, 2005.
2. Jean Paul Tremblay, Paul G Serenson, "The Theory and Practice of Compiler Writing", McGraw Hill, New Delhi, 2007.
3. Dick Grone, Henri E Bal, Ceriel J H Jacobs and Keen Gangendoen, Modern Compiler Design", John Wiley, New Delhi, 2009.
4. Steven S. Muchnick, "Advanced Compiler Design Implementation", First Edition Elsevier Science India, Morgan Kaufmann Publishers, 2008

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615CST03   **MOBILE APPLICATION DEVELOPMENT**   L T P C
                                                                3 0 0 3

OBJECTIVE(S):
- To learn the characteristics of mobile applications.
- To learn about the intricacies of UI required by mobile applications.
- To study about the design aspects of mobile application.
- To learn development of mobile applications.

Prerequisites: Java Programming

UNIT –I   **GETTING STARTED WITH MOBILITY**   9

Mobility landscape, Mobile platforms – Apple iPhone Platform- Google Android Platform – Eclipse Simulator, Mobile apps development, setting up the mobile app development environment along with an emulator - Case Study on Mobile App development.

UNIT-II   **BUILDING BLOCKS OF MOBILE APPS – I**   9

App user interface designing – mobile UI resources (Layout, UI elements, Drawable Menu), Activity- states and life cycle, interaction amongst activities. App functionality beyond user interface - Threads, ASync task, Services – states and lifecycle, Notifications.

UNIT-III   **BUILDING BLOCKS OF MOBILE APPS – II**   9

Broadcast receivers, Telephony and SMS APIs , Native data handling – on-device file I/O, shared preferences, mobile databases such as SQLite, and enterprise data access (via Internet/Intranet)

UNIT-IV   **SPRUCING UP MOBILE APPS**   9

Graphics and animation – custom views, canvas, animation APIs, multimedia – Audio/video playback and record, location awareness, and native hardware access (sensors such as accelerometer and gyroscope)

UNIT-V   **TESTING MOBILE APPS AND TAKING APPS TO MARKET**   9

Debugging mobile apps, White box testing, Black box testing, and test automation of mobile apps, JUnit for Android, Robotium, MonkeyTalk, Versioning, signing and packaging mobile apps, distributing apps on mobile market place.

                                                                TOTAL: 45

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COURSE OUTCOMES:

At the end of the course students should be able to

    CO1: Familiarize with Mobile apps development aspects.

    CO2: Design and implement the user interfaces for mobile applications

    CO3: Develop useful mobile applications using Google Android and Eclipse simulator.

    CO4: Develop mobile applications using graphics and animation

    CO5: Perform testing, signing, packaging and distribution of mobile apps

TEXT BOOK:

1. Anubhav Pradhan, Anil V Deshpande, "Mobile Apps Development", First Edition,

    Wiley India, (2013)

REFERENCE BOOKS:

1. Barry Burd , "Android Application Development All in one for Dummies", First   Edition , Wiley India ,(2011)

2. Lauren Darcey , Shane Conder, "Teach Yourself Android Application Development In 24 Hours", Second Edition, Wiley India , (2012)

615CST04	Web Programming	L T P C
		3 0 0 3

PREREQUISITES: Object Oriented Programming, Java Programming,

OBJECTIVES

- To provide an overview of working principles of internet, web related functionalities.
- To understand and practice embedded dynamic scripting on client side Internet Programming.
- To understand and apply the fundamentals core java, packages, database connectivity for computing.
- To acquire the knowledge on server side programming.
- To learn to develop web services using AJAX.

UNIT I INTRODUCTION   9

Internet Standards – Introduction to WWW – WWW Architecture - Overview of HTTP, HTTP request – response – Generation of dynamic web pages. UI DESIGN: Markup Language (HTML): Introduction to HTML and HTML5 - Formatting and Fonts –Commenting Code – Anchors – Backgrounds – Images – Hyperlinks – Lists – Tables – Frames - HTML Forms. Cascading Style Sheet (CSS): The need for CSS, Introduction to CSS – Basic syntax and structure -Inline Styles – Embedding Style Sheets - Linking External Style Sheets – Backgrounds – Manipulating text - Margins and Padding - Positioning using CSS

UNIT II JAVASCRIPT, JQUERY   9

Introduction to JavaScript - Syntax - Variables and data types - JavaScript Control Statements - Operators - Literals - Functions - Objects - Arrays - Built in objects - Event handling - **Fundamentals of JQuery - JQuery selectors - JQuery methods to access HTML attributes - Traversing - Manipulators - Events – Effects.**

UNIT III DOM,XML   9

Introduction to the Document Object Model - DOM History and Levels - Intrinsic Event Handling - Modifying Element Style - The Document Tree - Properties of window - DOM Collections - **Using Timer and Dynamic Styles to Create Animated Effects.XML** – Introduction-Form Navigation-XML Documents- XSL – XSLT.

UNIT-IV SERVER SIDE PROGRAMMING   9

Servlets: Java Servlet Architecture- Servlet Life Cycle- Form GET and POST actions- Session Handling-Understanding Cookies- Multi– tire application Installing and Configuring Apache Tomcat Web Server **DATABASE CONNECTIVITY:** JDBC perspectives, JDBC program example - **JSP:** Understanding Java Server Pages-JSP Standard Tag Library(JSTL)-Creating HTML forms by embedding JSP code.

UNIT V INTRODUCTION AJAX and WEB SERVICES   9

AJAX:Client Server Architecture-XML Http Request Object-Call Back Methods. Introduction to Web Services: UDDI, SOAP, WSDL, Service Provider, Service Consumer, Web Service Architecture, **Case Study:** Developing and deploying web services.

TOTAL HOURS: 45

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COURSE OUTCOMES

At the end of the course the students are able to

CO1: Acquire knowledge about functionalities of World Wide Web.
CO2: Explore markup languages features and create interactive web pages using them.
CO3: Learn and design Client side validation using scripting languages.
CO4: Design web page and connect to the databases.
CO5: Create, describe, publish and consume the Web Services.

TEXT BOOKS

1. Harvey M. Deitel and Paul J.Deitel, Internet & World Wide Web How to Program, Pearson Education, 2012.

2. Jeffrey C. Jackson, "Web Technologies - A Computer Science Perspective", Pearson Education, 2007.

REFERENCE BOOKS

1. Robert. W. Sebesta, "Programming the World Wide Web", Pearson Education, Fourth Edition, 2007.
2. Kogent Learning Solutions Inc., "Html5 Black Book: Covers CSS3, JavaScript, XKL, XHTML, AJAX,PHP and jQuery", Dreamtech Press, 2011.
3. Joe Fawcett, Danny Ayers, Liam R. E. Quin, "Beginning XML", John Wiley & Sons Publisher, FifthEdition, 2012
4. Achyut S Godbole and AtulKahate, "Web Technologies", Second Edition, Tata McGraw Hill, 2012.
5. Bates, "Developing Web Applications", Wiley, 2006.

L	T	P	C
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PREREQUISITES: Nil

OBJECTIVES

- Learning compiler construction tools.
- Designing the different phases of a compiler.
- Employing storage allocation strategies.

LIST OF EXPERIMENTS

1. Symbol table creation from a list of declarations
2. Lexical analyzer to recognize patterns in C (ex. Identifers, constants, comments, operators etc.)
3. Tokenizer using LEX tool.
4. Count the number of lines, words, blank spaces and characters in a file.
5. Computation of FIRST and FOLLOW.
6. Construction of LR Parsing Table.
7. Construct an operator precedence parse table.
8. Evaluation of arithmetic expression with LEX and YACC.
9. Syntax tree creation from —if statement.
10. Three address code generation for assignment statement with array references.
11. Three address code generation for Conditional Expression.
12. Translation of three address code to assembly language with fixed number of registers.
13. Storage allocation strategies.
14. Construction of DAG.
15. Code Optimization techniques (Constant Propagation, Constant Folding).

TOTAL HOURS: 45

COURSE OUTCOMES

At the end of the course the students are able to

CO1: Construct a token recognizer using LEX and YACC.
CO2: Demonstrate parsing and construct a syntax tree for control statements.
CO3: Generate intermediate code for the intermediate language.
CO4: Implement storage allocation strategies and flow graph.
CO5: Translate the source to target code and optimize it.

SOFTWARE REQUIRED

Operating System: Windows & Linux
Tools   : Lex, YAAC
Language   : C

615CSP08   **MOBILE APPLICATION DEVELOPMENT LABORATORY**

L	T	P	C
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OBJECTIVE(S):

The student should be made to:

- Know the components and structure of mobile application development frameworks for Android and windows OS based mobiles.
- Understand how to work with various mobile application development frameworks.
- Can able to draw basic graphical primitive on the mobile application.
- Learn the basic and important design concepts and issues of development of mobile applications.
- Understand how to work with GPS location tracking information.

LIST OF EXPERIMENTS:

1. Develop an application that uses GUI components, Font and Colours
2. Develop an application that uses Layout Managers and event listeners.
3. Develop a native calculator application.
4. Write an application that draws basic graphical primitives on the screen.
5. Develop an application that makes use of database.
6. Develop an application that makes use of RSS Feed.
7. Implement an application that implements Multithreading
8. Develop a native application that uses GPS location information.
9. Implement an application that creates an alert upon receiving a message.
10. Write a mobile application that creates alarm clock

TOTAL: 45

COURSE OUTCOMES:

At the end of the course, the student should be able to:

CO1: Design and Implement various mobile applications using emulators.
CO2: Deploy applications to hand-held devices

CO3: Develop an application using basic graphical primitives and databases.

CO4: Construct an application using multi threading and RSS feed and Make
  use of location identification using GPS in an application.

LIST OF EQUIPMENTS:

- Standalone desktops with Windows or Android or iOS or
  Equivalent Mobile Application Development
- Tools with appropriate emulators and debuggers.

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PREREQUISITES: Nil

OBJECTIVES

- Be familiar with Web page design using HTML / DHTML and style sheets
- Understand the importance of the web as a medium of communication.
- Use JavaScript to access and use web services for dynamic content
- Implement and understand how to interpret basic web analytics.
- Learn to create dynamic web pages using server side scripting.

LIST OF EXPERIMENTS

1. Create a html program for web site with forms, frames, links, tables etc
2. Create a script that asks the user for a name, then greets the user with "Hello" and the user name on the page
3. Create a script that collects numbers from a page and then adds them up and prints them to a blank field on the page.
4. Create a script that prompts the user for a number and then counts from 1 to that number displaying only the odd numbers.
5. Create a script that will check the field in Assignment for data and alert the user if it is blank. This script should run from a button.
6. Create a CSS style sheet and use it to display the document.
7. Creating simple application to access data base using JDBC Formatting HTML with CSS.
8. Design a programs in Java to create three-tier applications using JSP and Databases
9. Create a web application that functions as a simple hand calculator, but also keeps a "paper trail" of all your previous work.
10. Design a program to implement web service for calculator application
11. Design a program to implement Ajax.
12. Implement RMI concept for building any remote method of your choice.

TOTAL HOURS: 45

COURSE OUTCOMES
At the end of the course the students are able to

CO1: Design Web pages using HTML/DHTML and style sheets
CO2: Create dynamic web pages using server side scripting.
CO3: Design and Implement database applications.
CO4: Develop the simple GUI interfaces to interact with users and real time applications.

SOFTWARE REQUIREMENTS
Operating System: Linux / Windows
Programming Language & IDE: HTML 5, JDK 1.7, Coffee Cup Editor, PHP, Notepad++.
Server: Apache Tomcat Server / XAMP / LAMP
Backend: MYSQL / SQLite

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615ECE01   **Digital Image Processing**   **L T P C**
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OBJECTIVE:

This course gives the knowledge of effectively storing images, extracting interesting patterns from an image, discriminate between different classes of images, and mathematical fundamentals for image processing. This may lead to the confidence in developing image-processing applications.

UNIT – I   9

Digital Image Processing: Origins of Digital Image Processing, Steps in Digital Image Processing, Digital Image Fundamentals: Elements of Visual Perception, Light and the Electromagnetic Spectrum, Image Sensing and Acquisition, Image Sampling and Quantization, Basic Relationships between Pixels, Mathematical Tools used in Digital Image Processing.

UNIT – II   9

Image Transformation & Filters: Basic Intensity Transformation Functions, Histogram Processing, Fundamentals of Spatial Filtering, Smoothing Spatial Filter, Sharpening Spatial Filters, Combining Spatial Enhancement methods, Fuzzy techniques for Intensity Transformation and Spatial Filtering. Filtering in the Frequency Domain: Preliminary Concepts, Sampling and the Fourier Transforms of Sampled Functions, The Discrete Fourier Transform (DFT), Properties of the 2-D DFT, Filtering in the Frequency Domain, Image Smoothing and Sharpening using Frequency Domain Filters, Selective Filtering.

UNIT – III   9

Image Restoration, Reconstruction and Image Segmentation: Image Degradation/Restoration process, Noise Models, Restoration in the presence of Noise only-Spatial Filtering, Periodic Noise Reduction by Frequency Domain Filtering, Linear, Position-Invariant Degradations, Estimating the Degradation Functions, Inverse Filtering, Wiener Square Error Filtering, Constrained Least Square Filtering, Geometric Mean Filter, Image Reconstruction from Projections. Image Segmentation: Point, Line and Edge Detection, Thresholding, Region-Based Segmentation, Segmentation Using Morphological Watersheds, Use of Motion in Segmentation.

UNIT - IV   9

Color Image Processing: Color Fundamentals, Color Models, Pseudocolor Image Processing, Full Color Image Processing, Color Transformation, Smoothing and Sharpening, Image Segmentation Based on Color, Noise in Color Images. Wavelets and Multiresolution Processing: Multiresolution Expansion, Wavelet Transforms in One Dimension, The Fast Wavelet Transforms, Wavelet Transforms in Two Dimensions, Wavelet Packets. Image Compression: Fundamentals, Basic Compression Methods, Digital Image Watermarking.

UNIT - V   9

Morphological Image Processing: Erosion and Dilation, Opening and Closing, The Hit-Or-Miss Transformation, Basic Morphological Algorithms, Gray-Scale Morphology. Object Recognition: Patterns and Pattern Classes, Recognition Based on Decision-Theoretic Methods, Structural Methods.

                                                             Total : 45 Hours

TEXT BOOK:

1. Rafael C. Gonzalez, Richard E. Woods, "Digital Image Processing", 4th Edition 2013, Pearson Education.

REFERENCE BOOKS:

1. A.Jain, "Fundamentals of Digital Image Processing", Prentice Hall of India.
2. B.Chandra and D.Dutta Majumder , "Digital Image Processing and Analysis" Prentice-Hall of India   private limited , New delhi.

COURSE OBJECTIVES:
- To solve the Linear Programming and its applications,
- To introduce transportation and assignment problems with applications in industry
- To get familiarized with the integer programming and optimization techniques
- To expose the concepts of network scheduling of PERT &CPM.

UNIT I LINEAR PROGRAMMING   **9+3**
Principal components of decision problem – Modeling phases – Linear Programming Formulation and Graphical solution –Simplex method – Big M method.

UNIT II TRANSPORTATION AND ASSIGNMENT M MODELS   **9+3**
Transportation models –Initial solutions using North-West Corner method, Matrix-Minima and Vogel's approximation method- Assignment modes and solutions –Travelling salesmanship problems.

UNIT III GAME THEORY AND SEQUENCING   **9+3**
Game Theory – Two person Zero sum games – Saddle point, Dominance Rule- Convex Linear Combination (Averages), Graphical and LP solutions. Sequencing – Sequencing of 'n' jobs and '2' machines, 'n' jobs and '3' machines and 'n' jobs and 'm' machines.

UNIT IV OBJECT SCHEDULING   **9+3**
Network diagram representation – Critical Path Method (CPM) – Time charts and resource leveling – PERT - Minimal spanning tree - Shortest route.

UNIT V REPLACEMENT THEORY   **9+3**
Replacement Theory-Replacement policy for equipment which deteriorates gradually-replacement of items that fail suddenly.

                                               TOTAL HOURS: 60

COURSE OUTCOMES

At the end of the course the student will be able to
> **CO1:** Master the formulation of LPP to attain the optimal solution of real time problems.
> **CO2:** Apply the dual simplex method to find the optimal solution and handle the shortest route Problems using transportation and assignment models.
> **CO3:** Understand and apply various methods to minimize the cost and maximize the profit in job allocation problems.
> **CO4:** Expertise the PERT & CPM concepts which has a vital role in networking problems.

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TEXT BOOKS:

1. Hamdy A Taha, "Operations Research – An Introduction", Pearson, 10th Edition, 2016.

REFERENCES:

1. Paneerselvam, R, "Operations Research", PHI Learning, New Delhi, 2013.
2. Kalavathy, S., Operations Research, Vikas Publishing House., 2013.
3. G.Srinivasan, Operations Research – Principles and Applications, PHI , 2012.
4. Gupta P.K, Hira..D.S., Problem in Operations Research, S.Chand and Co., 2011.
5. Harvey M.Wrangler, "Principles of Operations Research", PHI 2007.

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615CSE07	SERVICE ORIENTED ARCHITECHTURE	L	T	P	C
		3	0	0	3

PREREQUISITES: Networks and web services

OBJECTIVE(S):
- To learn fundamentals of XML
- To provide an overview of Service Oriented Architecture and Web services and theirimportance
- To learn web services standards and technologies
- To learn service oriented analysis and design for developing SOA based applications

UNIT I   XML   9

XML document structure – Well-formed and valid documents – DTD – XML Schema – Parsing XMLusing DOM, SAX – XPath - XML Transformation and XSL – Xquery.

UNIT II SERVICE ORIENTED ARCHITECTURE (SOA) BASICS   9

Characteristics of SOA, Benefits of SOA , Comparing SOA with Client-Server and Distributedarchitectures —- Principles of Service Orientation – Service layers.

UNIT III WEB SERVICES (WS) AND STANDARDS   8

Web Services Platform – Service descriptions – WSDL – Messaging with SOAP – Service discovery – UDDI – Service-Level Interaction Patterns – Orchestration and Choreography.

UNIT IV WEB SERVICES EXTENSIONS   8

WS-Addressing - WS-Reliable Messaging - WS-Policy – WS-Coordination – WS -Transactions - WS-Security – Examples.

UNIT V SERVICE ORIENTED ANALYSIS AND DESIGN   11

SOA delivery strategies – Service oriented analysis – Service Modelling – Service oriented design – Standards and composition guidelines -- Service design – Business process design – Case Study.

TOTAL: 45 Hrs

COURSE OUTCOMES:

At the end of the course, the student should be able to:
CO1: Understand XML technologies
CO2: Understand service orientation, benefits of SOA
CO3: Understand web services and WS standards
CO4: Use web services extensions to develop solutions
CO5: Understand and apply service modeling, service oriented analysis and design for application
          development

TEXT BOOKS:

1. Thomas Erl, " Service Oriented Architecture: Concepts, Technology, and Design", PearsonEducation, 2005
2. Sandeep Chatterjee and James Webber, "Developing Enterprise Web Services: An Architect'sGuide", Prentice Hall, 2004

REFERENCES BOOKS:

1. James McGovern, Sameer Tyagi, Michael E Stevens, Sunil Mathew, "Java Web ServicesArchitecture", Elsevier, 2003.
2. Ron Schmelzer et al. "XML and Web Services", Pearson Education, 2002.
3. Frank P.Coyle, "XML, Web Services and the Data Revolution", Pearson Education, 2002

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615CSE08	Parallel and Distributed Computing	L	T	P	C
		3	0	0	3

PREREQUISITES: Design and Analysis of Algorithm, Computer Networks

OBJECTIVES
- Understand the need and fundamentals of parallel and distributed computing paradigms.
- Learn the organization and mapping of parallel processors.
- Build application using remote procedure call.
- Explore knowledge in distributed transaction processing.

UNIT I   INTRODUCTION TO PARALLEL COMPUTING   9
Parallel Processing Terminology - Scope of Parallel Computing - The PRAM model of Parallel Computation - PRAM Algorithms - Parallel reduction - Prefix Sum - List Ranking - Preorder Tree Traversal - Merging Two Sorted List - Graph Coloring.

UNIT II   PARALLEL PROCESSOR ORGANIZATION AND MAPPING   9
Processor Organization : Mesh Networks - Binary Tree Networks - Hypertree Networks - Pyramid Networks -Butterfly Networks - Hypercube Networks -Cube Connected Cycle Networks - Suffle Exchange Networks -Mapping data to Processors : Ring into 2D Mesh - 2D Mesh into 2D Mesh - Complete Binary Tree into 2D Mesh -Binomial Tree into 2D Mesh - Computing Graph into Hypercube - Complete Binary Tree into Hypercube.

UNIT III   DISTRIBUTED COMPUTING PARADIGM

9

Introduction to Distributed Computing System - Distributed Computing System Models - Distributed Operating System - Issues in Designing a Distributed Operating System - Introduction to Distributed Computing Environment (DCE) - Network Types - Communication Protocols - Internetworking

UNIT IV   MESSAGE PASSING AND REMOTE PROCEDURE CALL   9
Desirable issues of a Good Message Passing - Issues in IPC by message passing - Multi Datagram Messages - Encoding and Decoding of Message Data - Group Communication - The RPC Model - Transparency of RPC - Implementing RPC mechanism - Stub Generation - RPC Messages - Communication Protocols for RPCs - Client-Server Binding.

UNIT V   DISTRIBUTED TRANSACTION PROCESSING   9
Transactions - Nested Transactions - Locks - Optimistic Concurrency Control - Timestamp Ordering - Comparison - Flat and Nested Distributed Transactions - Atomic Commit protocols - Concurrency Control in Distributed Transactions.

TOTAL HOURS: 45

COURSE OUTCOMES

Upon completion of the course, the students will be able to

CO1: Apply parallel programming algorithms for real world problems.
CO2: Acquire knowledge on different processor organization and its mapping.
CO3: Develop applications by incorporating distributed computing architectures.
CO4: Design various communication protocols using remote procedure call.
CO5: Implement and deploy the application using distributed transaction processing.

TEXT BOOK

1. Michael Quinn, "Parallel Computing - Theory and Practice", Second Edition, Tata McGraw Hill, 2012.
2. Distributed Operating System: Concepts and Design, Pradeep K. Sinha, PHI , 2012.

REFERENCES

1. Ananth Grama, Anshul Gupta, George Karypis andVipin Kumar, "Introduction to Parallel Computing", Second Edition, Pearson Education, 2009.
2. George Coulouris, Jean Dollimore and Tim Kindberg, Distributed Systems, Concepts and Design, Perason Education, 3rd Edition 2011.
3. Haggit Attiya and Jennifer Welch, "Distributed Computing - Fundamentals, Simulations and Advanced Topics", Second Edition, Wiley, 2012.
4. Norman Matloff, "Parallel Computing for Data Science -With Examples in R, C++ and CUDA", Chapman and Hall/CRC, 2015.
5. Wan Fokkink, "Distributed Algorithms: An Intuitive Approach", MIT Press, 2013.
6. M.L. Liu, "Distributed Computing -Principles and Applications", First Edition, Pearson Education, 2011.

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PREREQUISITES: Nil

OBJECTIVES

- Understand the importance of ANN, Fuzzy and GA .
- Learn the various soft computing algorithms.
- Build application using soft computing algorithms
- Explore to hybrid techniques and its applications

UNIT - I INTRODUCTION   9

Artificial neural network: Introduction, characteristics- learning methods – taxonomy – Evolution of neural networks- basic models - important technologies - applications. Fuzzy logic: Introduction - crisp sets- fuzzy sets - crisp relations and fuzzy relations: Cartesian product of relation - classical relation, fuzzy relations, tolerance and equivalence relations, non-iterative fuzzy sets. Genetic algorithm- Introduction - biological background - traditional optimization and search techniques - Genetic basic concepts.

UNIT - II NEURAL NETWORKS   9

McCulloch-Pitts neuron - linear separability - hebb network - supervised learning network: perceptron networks - adaptive linear neuron, multiple adaptive linear neuron, BPN, RBF, TDNN- associative memory network: auto-associative memory network, hetero-associative memory network, BAM, hopfield networks, iterative autoassociative memory network & iterative associative memory network – unsupervised learning networks: Kohonen self organizing feature maps, LVQ – CP networks, ART network

UNIT – III FUZZY LOGIC   9

Membership functions: features, fuzzification, methods of membership value assignments- Defuzzification: lambda cuts - methods - fuzzy arithmetic and fuzzy measures: fuzzy arithmetic - extension principle - fuzzy measures - measures of fuzziness -fuzzy integrals - fuzzy rule base and approximate reasoning : truth values and tables, fuzzy propositions, formation of rules-decomposition of rules, aggregation of fuzzy rules, fuzzy reasoning-fuzzy inference systems-overview of fuzzy expert system-fuzzy decision making.

UNIT – IV GENETIC ALGORITHM   9

Genetic algorithm and search space - general genetic algorithm – operators - Generational cycle - stopping condition – constraints - classification - genetic programming – multilevel optimization – real life problem- advances in GA.

Neuro-fuzzy hybrid systems - genetic neuro hybrid systems - genetic fuzzy hybrid and fuzzy genetic hybrid systems - simplified fuzzy ARTMAP - Applications: A fusion approach of multispectral images with SAR, optimization of traveling salesman problem using genetic algorithm approach, soft computing based hybrid fuzzy controllers.

TOTAL HOURS: 45

COURSE OUTCOMES

At the end of the course the students are able to

CO1:   Acquire knowledge on Artificial Neural Networks, Fuzzy Logic and Genetic Algorithms.
CO2:   Apply soft computing techniques to real-life situations.
CO3:   Design of various soft computing based networks and controllers.
CO4:   Apply genetic programming to real world problems.
CO5:   Discuss and integrate various soft computing techniques.

TEXT BOOKS

1. J.S.R.Jang, C.T. Sun and E.Mizutani, "Neuro-Fuzzy and Soft Computing", PHI / Pearson Education 2004.

2. S.N.Sivanandam and S.N.Deepa, "Principles of Soft Computing", Wiley India Pvt Ltd, 2011.

REFERENCES

1. S.Rajasekaran and G.A.Vijayalakshmi Pai, "Neural Networks, Fuzzy Logic and Genetic Algorithm: Synthesis & Applications", Prentice-Hall of India Pvt. Ltd., 2006.

2. George J. Klir, Ute St. Clair, Bo Yuan, "Fuzzy Set Theory: Foundations and Applications" Prentice Hall, 1997.
3. David E. Goldberg, "Genetic Algorithm in Search Optimization and Machine Learning" Pearson Education India, 2013.

4. James A. Freeman, David M. Skapura, "Neural Networks Algorithms, Applications, and Programming Techniques, Pearson Education India, 1991.

5. Simon Haykin, "Neural Networks Comprehensive Foundation" Second Edition, Pearson Education, 2005.

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615CSE10   Pervasive Computing

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OBJECTIVES

- To understand the characteristics and significances of Pervasive Computing and the solutions those are in use.
- To realize the sensing technologies of pervasive environment.
- To design and implement pervasive applications in collaboration with different technologies.

UNIT I   INTRODUCTION TO PERVASIVE COMPUTING   9

Pervasive Computing and its significances – Research trends in pervasive computing and networking. Mobile Agent Technology - Mobile Agent Security - Mobile Agent Platforms - Sensor Networks - Sensor Network Applications Elements of a Context-Aware Pervasive System – Sensing, Thinking, Acting.

UNIT II   ELEMENTS OF PERVASIVE COMPUTING   9

Adhoc and Sensor Network – Properties of an Adhoc networks – Unique features of Sensor Network – Constraint Resources – Mobility - Mobile Sensor Cooperation: Mobility to Enhance Functionality, Mobility to Enhance Dependability, - Cooperation across Mobile Entities: Cooperative Path Planning, Data-Based Agreement for Coordination.

UNIT III   AUTONOMIC AND PROTOCOLS   9

Pervasive Networks Architecture - Protocols – Auto configuration: Neighborhood discovery, Topology discovery, MAC Schedule Construction. Energy Efficient Communication: Multi-hop routing, Communication scheduling, Sleep Scheduling, Clustering.

UNIT IV   PERVASIVE APPROACHES AND SOLUTIONS   9

Approaches and Solutions – Deployment and Configuration, Routing, Fault Tolerant and Reliability. Mobile and wireless security issues: Detectability, Resource depletion, physical intercept problem, Theft of service.

UNIT V   PERVASIVE LEARNING TOOLS AND TECHNOLOGIES   9

Pervasive Learning Tools and Technologies - Emerging Technologies and Systems for Pervasive Learning - Integration of Real-World Practice and Experience with Pervasive Learning - Smart Devices, Systems and Intelligent Environments: Smart Home, Smart Car, Smart Laboratory.

TOTAL: 45 PERIODS

COURSE OUTCOMES:

At the end of the course the students are able to

CO1: Outline the basic significances and performance requirements of pervasive computing.
CO2: Understand the basic pervasive computing elements and autonomic behavior of sensors.
CO3: Examine and analyze various pervasive approaches and possible solutions.
CO4: Design and develop diversified smart applications using pervasive computing techniques.

TEXT BOOKS:

1. Mohammad S., Obaidat, Mieso Denko, Isaac Woungang, Pervasive Computing and Networking, John Wiley & Sons, First Edition, 2011.

2. Frank Adelstein, Sandeep Gupta, Golden Richard III, Loren Schwiebert, Fundamentals of Mobile and Pervasive Computing, Tata McGraw Hill, New Delhi, 2005.

REFERENCE:

1. Rahul Banerjee, "Lecture Notes in Pervasive Computing", Outline Notes, BITS - Pilani, 2012.
2. Genco, S. Sorce, "Pervasive Systems and Ubiquitous Computing", WIT Press, 2012
3. StefenPoslad, "Ubiquitous Computing: Smart Devices, Environments and Interactions", Wiley, Second Edition, 2010

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PREREQUISITE: Basic Knowledge of Operating Systems and Database Management system

OBJECTIVES:
- To understand various system functionalities of Mainframe system specifically z/OS.
- To know the concept of handling and accessing large amount of data in Mainframe Environment.

UNIT I INTRODUCTION   9

Mainframe concepts-an evolving architecture- mainframe computer users- factors contributing to mainframe use – mainframe workloads.

UNIT II CAPACITY   9

Capacity – elements of a system required for capacity – few server Vs Many server –service level agreement – managing the system to the SLA – architecture, running work and capacity – several servers on one physical machine – parallel sysplex and its measurements.

UNIT III SCALABILITY, INTEGRITY AND AVAILABILITY   9

Introduction to scalability – scalability concepts – scalability implementation on IBM system – Introduction to integrity – Integrity serialization– introduction to availability – Inhibitors to availability - redundancy – z/OS elements for availability – Disaster recovery.

UNIT IV ACCESSING LARGE AMOUNT OF DATA   9

Introduction – channel subsystem – control unit – mapping for access to devices -multiple allegiance/Parallel Access volumes – database and data sharing Data placement and management .

UNIT V SYSTEM MANAGEMENT AND AUTONOMIC COMPUTING   9

Introduction – system data – workload management – operations management performance management – autonomic computing principles - autonomic computing concepts – z/OS implementation of autonomic computing – self healing – self configuring - self protecting – self optimizing.

TOTAL: 45

COURSE OUTCOMES:

At the end of this course, the students will be able to
- Able to understand the basic concepts of Mainframe system and its implementation issues of z/OS.
- Able to handle the Integrity and Scalability in Mainframe Environment.
- Able to gain knowledge on various system managements in z/Os

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TEXT BOOK

1. Mike Ebbers, Frank Byrne, Pilar Gonzalez Adrados, Rodney Martin and Jon Veilleux, "Introduction to the New Mainframe : Large Scale Commercial Computing", IBM International Technical Support Organization, 2006

REFERENCE BOOKS:

1. Alexis Leon, "IBM Mainframe Handbook", Leon Vikas Publishing House Pvt. Ltd., Chennai, 2003
2. Lydia Parziale, Edi Lopes Alves, Klaus Egeler, Clive Jordan" Introduction to the New Mainframe: VM Basics", IBM International

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PREREQUISITES: Web Programming

OBJECTIVE(S):
- To understand the Web Service architecture
- To understand the Web Service Building Blocks
- To understand the development of deployment of web services
- To understand the security issues of XML

UNIT I   XML TECHNOLOGY FAMILY   9

XML – Benefits – Advantages of XML over HTML – EDI – Databases – XML based standards – Structuring with schemas – DTD – XML schemas – XML processing – DOM – SAX – Presentation technologies – XSL – XFORMS – XHTML – Transformation – XSLT – XLINK – XPATH – X query.

UNIT II   ARCHITECTING WEB SERVICES   9

Business motivations for web services – B2B – B2C – Technical motivations – Limitations of CORBA and DCOM – Service oriented architecture (SOA) – Architecting web services – Implementation view – Web services technology stack – Logical view – Composition of web services – Deployment view –From application server to peer to peer – Process view – Life in the runtime.

UNIT III   WEB SERVICES BUILDING BLOCKS   9

Transport protocols for web services – Messaging with web services – Protocols – SOAP – Describing web services – WSDL – Anatomy of WSDL – Manipulating WSDL – Web service policy – Discovering web services – UDDI – Anatomy of UDDI – Web service inspection – Ad hoc discovery – Securing web services.

UNIT IV   IMPLEMENTING XML IN E–BUSINESS   9

B2B – B2C applications – Different types of B2B interaction – Components of e-business XML systems – EBXML – Rosetta net – Applied XML in vertical industry – Web services for mobile devices.

UNIT V   XML SECURITY   9

Security Overview - Canonicalization - XML Security Framework - XML Encryption - XML Digital Signature - XKMS Structure - Guidelines for Signing XML Documents - XML in Practice.

Total 45 Hrs

COURSE OUTCOMES:

At the end of the course students should be able to

CO1: Assess and evaluate the role of XML.
CO2: Understand architecting web services.
CO3: Deploy and publish web services.
CO4: Understand XML Security framework and XML Documents

TEXT BOOKS

1. Ron Schmelzer&Travis Vandersypen, "XML and Web Services Unleashed", Pearson Education, 2002.

2. frank p.coyle, "xml, web services and the data revolution", pearson education, 2002

REFERENCES:

1. Sandeep Chatterjee, James Webber, "Developing Enterprise Web Services", Pearson Education, 2004.
2. https://www.w3.org/standards/xml/security

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OBJECTIVES:

- To learn the basics of Wireless voice and data communications technologies.
- To build working knowledge on various telephone and satellite networks.
- To study the working principles of wireless LAN and its standards.
- To build knowledge on various Mobile Computing algorithms.
- To build skills in working with Wireless application Protocols to develop mobile content applications.

UNIT I   **WIRELESS COMMUNICATION FUNDAMENTALS**   **9**

Introduction - Wireless transmission - Frequencies for radio transmission - Signals - Antennas - Signal Propagation - Multiplexing - Modulations - Spread spectrum - Cellular Systems - MAC - SDMA - FDMA - TDMA - CDMA – Comparison of S/T/F/CDMA.

UNIT II   **TELECOMMUNICATION NETWORKS**   **11**

Telecommunication systems - GSM - GPRS - DECT – Satellite Systems - Routing – Localization – Handover - Broadcast Systems - DAB - DVB.

UNIT III   **WIRLESS LAN**   **9**

Wireless LAN - IEEE 802.11 standards - Architecture - services - Physical layer - MAC - IEEE 802.11a - IEEE 802.11b - HIPERLAN - Blue Tooth.

UNIT IV   **MOBILE NETWORK LAYER**   **9**

Mobile IP - Dynamic Host Configuration Protocol - Mobile adhoc networks - Routing - DSDV - DSR - Alternative Metrics.

UNIT V   **TRANSPORT AND APPLICATION LAYERS**   **7**

Traditional TCP - Classical TCP improvements – WAP – Architecture – WDP – WTLS – WTP – WSP – WAE – WML – WMLScript – WTA.

                                    Total : 45 Hours

TEXT BOOKS

1. Jochen Schiller, "Mobile Communications", PHI/Pearson Education, Second Edition, 2012.

REFERENCES

1. William Stallings, "Wireless Communications and Networks", PHI/Pearson Education, 2010.
2. Kaveh Pahlavan, Prasanth Krishnamoorthy, "Principles of Wireless Networks", PHI/Pearson Education, 2011.
3. Uwe Hansmann, Lothar Merk, Martin S. Nicklons and Thomas Stober, "Principles of Mobile Computing", Springer, New York, 2003.
4. Hazysztof Wesolowshi, "Mobile Communication Systems", John Wiley and Sons Ltd, 2010.

OBJECTIVE

- To understand the communication between web browsers and servers as well as how information is displayed by browser.
- Presents basic information about cascading style sheets (CSS), a style sheet technology designed to work with HTML and XML documents. Study of JavaScript as a programming language, largely independently of how it might relate to a web browser.
- Focus on Document Object Model (DOM), an API that defines how JavaScript programs can access and manipulate the HTML document currently displayed by a browser. Moves from client-side programming involving web browsers to server-side programming (Servlet).
- Focus on Java server pages technology (Separating Programming and Presentation).
- Illustrates how the various web service technologies interact.

UNIT I INTRODUCTION   9

Internet Principles and Components: History of the Internet and World Wide Web- CGI- Protocols-HTTP, SMTP, POP3, MIME, IMAP. Domain Name Server, Web Browsers and Web Servers. An Introduction to HTML History-Versions-Basic XHTML Syntax and Semantics-Some Fundamental HTML Elements-Relative URLs-Lists-tables-Frames-Forms-XML Creating HTML Documents.

UNIT II JAVA APPLET & STYLE SHEETS   9

Java Applet: Introduction – Starting an Applet application – Applet component basics – Labels and Icons – Buttons – Bounded range components – List and Combo Boxes. Style Sheets: CSS-Introduction to Cascading Style Sheets-Features-Core Syntax-Style Sheets and HTML Style Rule Cascading and Inheritance.

UNIT III JAVASCRIPT, DHTML   9

Client-Side Programming: The JavaScript Language-History and Versions Introduction to JavaScript in Perspective-Syntax-Variables and DataTypes-Statements-Operators-Literals-Functions-Objects-Arrays-Built-in Objects- **JavaScript Debuggers.** Host Objects: Browsers and the DOM-Introduction to the Document Object Model DOM History and Levels-Intrinsic Event Handling-Modifying Element Style-The Document Tree-DOM Event Handling-Accommodating Noncompliant Browsers Properties of window.

UNIT IV JAVA SERVLETS AND JSP   9

Architecture -Overview-A Servlet - Generating Dynamic Content-Life Cycle- Parameter Data-Sessions-Cookies - URL Rewriting-Other Capabilities-Data Storage Servlets and Concurrency-Case Study- Related Technologies.

JSP Technology-Introduction-JSP and Servlets-Running JSP Applications Basic JSP-JavaBeans Classes and JSP-Tag Libraries and Files-Support for the Model-View-Controller Paradigm Related Technologies.

UNIT V WEB SERVICES   9

Introduction to Web Services: XML, XSD, UDDI, SOAP, WSDL, REST , Service Provider, Service Consumer, Web Service Architecture, Developing and deploying web services Case Study.

TOTAL:45 PERIODS

TEXT BOOKS
1. Deitel and Deitel, Goldberg, "Internet and World Wide Web – How to Program", Pearson Education Asia, 2001.
2. Jeffrey C. Jackson, "Web Technologies--A Computer Science Perspective", Pearson Education, 2006.
3. Eric Newcomer, "Understanding Web Services: XML, WSDL, SOAP, and UDDI", Addison-Wesley, 2002.

REFERENCE BOOKS
1. Robert. W. Sebesta, "Programming the World Wide Web", Fourth Edition, Pearson Education, 2007.
2. Deitel, Deitel, Goldberg, "Internet & World Wide Web How to Program", Third Edition, Pearson Education' 2006.
3. Marty Hall and Larry Brown, "Core Web Programming" Second Edition, Volume I and II, Pearson Education, 2001.
4. Bates, "Developing Web Applications", Wiley, 2006.
5. Phillip Hanna, "JSP 2.0 - The Complete Reference", McGraw-Hill, 2003.
6. Mathew Eernisse, "Build Your Own AJAX Web Applications", Site Point, 2006.

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OBJECTIVES:

- To introduce the basic concepts of OSS and open source operating system.
- To give strong foundation in recent open source databases.
- To develop good programming skills by studying various scripting languages.

UNIT I   INTRODUCTION   9

Introduction to Open sources – Need of Open Sources – Advantages and Applications of Open Sources. FOSS Licensing models – FOSS development process and basic principles – Open source operating systems: LINUX: Introduction – General Overview – File System – File system Hierarchies – Kernel Mode and user mode – Process – Advanced Concepts – Scheduling – Personalities – Cloning – Signals – Development with Linux – Introduction of Linux variants.

UNIT II   OPEN SOURCE DATABASES   9

MySQL: Introduction – Setting up account – Record selection Technology – Working with strings – Date and Time– Sorting Query Results – Generating Summary –Using sequences.
PostgreSQL: Introduction – Commonplace PSQL tasks – Working with databases, Schemas, Tables – Data types and Attributes – PSQL Functions – PSQL Triggers.

UNIT III   OPEN SOURCE PROGRAMMING LANGUAGES   9

PHP: Introduction – Programming in web environment – variables – constants –data types – operators – Statements – Functions – Arrays – OOP – String Manipulation and regular expression – File handling and data storage – PHP and SQL database – PHP and LDAP – PHP Connectivity – Sending and receiving E-mails – Debugging and error handling – Security – Templates.

UNIT IV   PYTHON   9

Syntax and Style – Python Objects – Numbers – Sequences – Strings – Lists and Tuples – Dictionaries – Conditionals and Loops – Files – Input and Output – Errors and Exceptions – Functions – Modules – Classes and OOP – Execution Environment.

UNIT V   PERL   9

Perl backgrounder – Perl overview – Perl parsing rules – Variables and Data – Statements and Control structures – Subroutines, Packages, and Modules- Working with Files –Data Manipulation.

Total: 45 Hours

TEXT BOOKS:

1. Remy Card, Eric Dumas and Frank Mevel, "The Linux Kernel Book", Wiley Publications, 2010
2. Steve Suchring, "PHP & MySQL Bible", John Wiley, Reprint 2010
References:
1. Rasmus Lerdorf and Levin Tatroe, "Programming PHP", O'Reilly, 2009
2. Wesley J. Chun, "Core Phython Programming", Prentice Hall, 2010
3. Martin C. Brown, "Perl: The Complete Reference", 2nd Edition, Tata McGraw-Hill Publishing Company Limited, Indian Reprint 2009.

4. Steven Holzner, "PHP: The Complete Reference", 2nd Edition, Tata McGraw-Hill Publishing Company Limited, Indian Reprint 2009.

5. W. Jason Gilmore and Robert H.Treat, "Beginning PHP and PostgreSQL", Apress, First Indian Reprint 2010.

6. Vikram Vaswani, "MYSQL: The Complete Reference", 2nd Edition, Tata McGraw- Hill Publishing Company Limited, Indian Reprint 2009.

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OBJECTIVE

- The purpose of this course is to introduce students to the fundamentals of analysis and design of Computer information systems to meet business requirements. Students will learn and practice various methods, tools and techniques used by the systems analyst at each phase within the Systems development cycle.
- The course will cover object-oriented systems analysis and design techniques as well as managerial aspects of analysis and design such as project management and information gathering techniques. The course also introduces computer aided software development (CASE) technology.

UNIT - I   **INTRODUCTION**   **9**

Introduction- Basic Characteristics of Object-Oriented Systems- Classes and Objects- Methods and Messages- Encapsulation and Information Hiding- Inheritance-Polymorphism and Dynamic Binding- The Unified Modeling Language, Version 2.0- Structure Diagrams- Behavior Diagrams- Extension Mechanisms- Object-Oriented Systems Analysis and Design- Benefits of Object-Oriented Systems Analysis and Design

UNIT - II   **ANALYSIS PHASE**   **9**

Introduction- Requirements Determination- Requirements Definition- Determining Requirements- Creating the Requirements Definition- Requirements Analysis Techniques Business Process Automation-Business Process Improvement-Business Process Reengineering Selecting the Appropriate Technique-Requirement Gathering Techniques-Interviews Joint Application Development-Questionnaires-Document Analysis Observation-Selecting the Appropriate Techniques

UNIT - III   **MODELING**   **9**

Introduction-Business Process Modeling with Activity Diagrams-Elements of an Activity Diagram-Guideline for Creating Activity Diagrams-Use Case Descriptions-Types of Use Cases Elements of a Use Case Description-Guidelines for Creating Use Case Descriptions-Use Case Diagrams-Actor-Association-Use Case-Structural Models Classes, Attributes, and Operations Relationships-Class-Responsibility-Collaboration Cards-Responsibilities and Collaborations Class Diagrams-Elements of a Class Diagram-Simplifying Class Diagrams-Object Diagrams Behavioral Models-Interaction Diagrams-Objects, Operations, and Messages-Sequence Diagrams-Communication Diagrams-Behavioral State Machines-States, Events, Transitions, Actions, and Activities-Elements of a Behavioral State Machine

UNIT - IV   **DESIGN PHASE**   **9**

Introduction-Evolving the Analysis Models into Design Models-Factoring-Partitions and Collaborations-Layers - Packages and Package Diagrams-Identifying Packages and Creating Package Diagrams-Design Criteria-Coupling-Cohesion-Connascence-Object Design Activities Additional Specification-Identifying Opportunities for Reuse-Restructuring the Design Optimizing the Design-Mapping Problem Domain Classes to Implementation Languages Constraints and Contracts-Types of Constraints-Elements of a Contract Method Specification

Introduction-Principles for User Interface Design-Layout-Content Awareness-Aesthetics-User Experience-Consistency-Minimize User Effort-User Interface Design Process-Use Scenario Development-Interface Structure Design-Interface Standards Design-Interface Design Prototyping-Interface Evaluation-Navigation Design-Basic Principles-Types of Navigation Controls-Messages-Navigation Design Documentation

TEXT BOOKS

1. Systems Analysis and Design with UML Version 2.0 An Object-Oriented Approach Alan Dennis Indiana University,Barbara Haley Wixom University of Virginia,David egarden Virginia Tech, Second Edition,John Wiley & Sons,2005.

REFERENCES

1. Object Oriented System Development, Ali Bahrami, McGraw-Hill International Edition,1999

2. Object Oriented analysis and Design, Booch G, Addison-Wesley Publishing company,1994

3. Object-Oriented Modeling and Design with UML, Michael Blaha, James Rumbaugh, Second Edition, Pearson Education,2004.

LIST OF EXPERIMENTS

1. Create a web page with the following using HTML

i) To embed an image map in a web page

ii) To fix the hot spots

iii) Show all the related information when the hot spots are clicked.

2. Create a web page with all types of Cascading style sheets.

3. Client Side Scripts for Validating Web Form Controls using DHTML

4. Write programs in Java to create applets incorporating the following features:

Create a color palette with matrix of buttons

Set background and foreground of the control text area by selecting a color from color palette.

In order to select Foreground or background use check box control as radio buttons

To set background images

5. Write programs in Java using Servlets:

To invoke servlets from HTML forms

To invoke servlets from Applets

6. Write programs in Java to create three-tier applications using JSP and Databases

For conducting on-line examination.

For displaying student mark list. Assume that student information is available in a database which has been stored in a database server.

7. Programs using XML – Schema – XSLT/XSL

8. Programs using AJAX

9. Write a PHP script using arrays and functions.

10. Write a program to read, write, update and delete the database using PHP.

11. Write a Python script to implement Lists and Dictionaries.

12. Write a Python script to copy one file into another with exception handling.

13. Write a Python script using object and classes.

14. Write a program to implement database connectivity in Python.

15. Write a Perl script to implement

      i. Perl with CGI connection   ii. Database connectivity with perl and MySql

Prepare the following documents for each experiment and develop the software using software engineering methodology.

1. Problem Analysis and Project Planning Thorough study of the problem – Identify project scope, Objectives, infrastructure
2. Software Requirement Analysis Describe the individual Phases/ modules of the project, Identify deliverables.
3. Data Modelling Use work products – data dictionary, use case diagrams and activity diagrams, build and test class diagrams, sequence diagrams and add interface to class diagrams.
4. Software Development and Debugging.
5. Software Testing Prepare test plan, perform validation testing.

LIST OF EXPERIMENTS:

1. Course Registration System
2. Online ticket reservation system for Airways
3. Remote computer monitoring
4. Expert system to prescribe the medicines for the given symptoms
5. Platform assignment system for the trains in a railway station

SOFTWARE REQUIRED:

    Case Tools : Rational Suite / ArgoUML/StarUML
    Languages : C/C++/JDK 1.3/JSDK,VB, INTERNET EXPLORER, UML 2.0
    Front End : Java/VB
    Back End   : Oracle, MS-Access, SQL

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OBJECTIVES

- Building and design of the foundational enterprise IT architecture
- To evolving technology, continued improvements in enterprise applications and establishing baseline metrics is important to the sustenance of key infrastructure elements of software enterprise applications
- A Unified meta-model of elements can lead to effective business analysis from an idea that originated in order to bring rigid engineering concepts to building enterprise IT systems, Enterprise Architecture (EA) is evolving into a business-driven
- To formally capture and implement the dynamic and static elements of an enterprise to manage enterprise change

UNIT I INTRODUCTION   8

Introduction to Enterprise Applications and their Types, Software Engineering Methodologies, Life Cycle of Raising an Enterprise Application, Introduction to Skills Required to Build an Enterprise Application, Key Determinants of Successful Enterprise Applications, and Measuring the Success of Enterprise Applications.

UNIT II INCEPTING ENTERPRISE APPLICATIONS   9

Inception of Enterprise Applications, Enterprise Analysis, Business Modeling, Requirements Elicitation, Use Case Modeling, Prototyping, Non Functional Requirements, Requirements Validation, Planning and Estimation.

UNIT III ARCHITECTING AND DESIGNING ENTERPRISE APPLICATIONS   10

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 CONSTRUCTING ENTERPRISE APPLICATIONS   9

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 and Testing, Dynamic Code Analysis – Code Profiling and Code Coverage.

UNIT V TESTING AND ROLLING OUT ENTERPRISE APPLICATIONS   9

Types and Methods of Testing an Enterprise Application, Testing Levels and Approaches, Testing Environments, Integration Testing, Performance Testing, Penetration Testing, Usability Testing,

Globalization Testing and Interface Testing, User Acceptance Testing, Rolling out an Enterprise Application.

TOTAL: 45

TEXT BOOK

1. Raising Enterprise Applications: A Software Engineering Perspective, Anubhav Pradhan Satheesha B. Nanjappa Senthil K. Nallasamy Veerakumar Esakimuthu, 1st Edition, Wiley India Pvt Ltd, 2010, ISBN:9788126519460.

REFERENCE BOOKS

1. Raffaele Garofalo, "Building Enterprise Applications with Windows Presentation Foundation and the Model View ViewModel Pattern", 1st Edition, Microsoft Press, 2011

2. Dominic Duggan, "Enterprise Software Architecture and Design Entities, Services, and Resources", 1st Edition, Wiley India Pvt Ltd, 2012

3. Martin Fowler, "Patterns of Enterprise Application Architecture", 1st Edition, Pearson/ Goels Computer Hut Publisher,

    USER INTERFACE DESIGN   **L T P C**

                                                          3 0 0 3

OBJECTIVES

- Design process management.
- Interaction devices and windows strategies.
- To study the concept of menus, windows, interfaces.
- To study about business functions.
- To study the characteristics and components of windows.
- To study the testing methods.

UNIT I   INTRODUCTION   **9**

Importance – Human - Computer Interface - Characteristics of Graphics Interface - Direct Manipulation Graphical System - Web User Interface – Popularity - Characteristic & Theories, Principles, and Guidelines-Managing Design.

UNIT II   HUMAN COMPUTER INTERACTION   **9**

User Interface Design Process- Obstacles-Usability-Human Characteristics In Design - Human Interaction Speed-Business Functions-Requirement Analysis-Direct-Indirect Methods-Basic Business Functions-Design Standards- General Design Principles – Conceptual Model Design- Conceptual Model Mock-Ups-System Timings - Human Consideration In Screen Design - Structures of Menus - Functions of Menus-Contents of Menu-Formatting -Phrasing The Menu - Selecting Menu Choice-Navigating Menus-Graphical Menus.

UNIT III WINDOWS   **9**

Characteristics – Components - Presentation Styles - Types – Managements – Organizations – Operations - Web Systems – Device - Based Controls Characteristics - Screen - Based Controls Operate Control - Text Boxes - Selection Control - Combination Control - Custom Control - Presentation Control - Write Clear Text & Messages.

UNIT IV   MULTIMEDIA   **9**

Text for Web Pages - Effective Feedback - Guidance & Assistance – Internationalization – Accessibility – Icons – Image – Multimedia - Coloring.

UNIT V WINDOWS LAYOUT AND TEST   **9**

Organizing and Laying Out Screens – Prototypes - Kinds of Test - Retest - Developing and Conducting Test - Software Tools- Specification Methods- Interface Building Tools-Evaluation & Critiquing Tools.

                                                               TOTAL: 45 Hours

TEXT BOOK

1. Wilbent. O. Galitz ,"The Essential Guide to User Interface Design", John Wiley& Sons, 2001.

REFERENCE BOOKS

1. Ben Sheiderman, "Design the User Interface", Pearson Education, 1998.

2. Alan Cooper, "The Essential of User Interface Design", Wiley - Dream Tech Ltd., 2002.

                                                                      3 0 0 3

OBJECTIVES

To enable the students to create an awareness on Engineering Ethics and Human values to instill

- Responsibilities and Rights
- Moral and Social Values
- Ethics in Business and Computer Research
- Global issues.

UNIT I   ENGINEERING ETHICS   9

Senses of Engineering Ethics- Variety of Moral Issues- Types of Inquiry- Moral Dilemmas-Moral Autonomy-Kohlberg`s Theory-Gilligan`s Theory- Professions and Professionalism- Engineering as Experimentation- Engineers as Responsible Experimenters-Research Ethics.

UNIT II   RESPONSIBILITIES, RIGHTS AND HUMAN VALUES   9

Collegiality and Loyalty - Respect for Authority - Collective Bargaining - Confidentiality-Conflicts of Interest - Occupational Crime-Professional Rights - Employee Rights- Intellectual Property Rights (IPR) – Crimination. Introduction to Yoga and Meditation for Professional Excellence and Stress Management. Cross-Cultural Ethics.

UNIT III COMPUTERETHICS   9

Ethics in Business World-IT Professionals-Ethical Behavior of IT Professionals- Computer and Internet Crime-IT Security Incidents-Reducing Vulnerabilities-Key Privacy and Anonymity Issues-Use of Non- Traditional Workers. Case Study Y2K Problem, Data Security in Cloud.

UNIT IV BUSINESSETHICS   9

Meaning, Nature, Scope of Business Ethics- Relevance of Business Ethics- Changing Work Place- Ethical Issues in Marketing- Ethical Responsibilities of Business Towards Consumers and Employees.

UNIT V GLOBALISSUES   9

Multinational Corporations-Role in Technological Development- Weapon Development- Engineers as Managers-Consulting Engineers- Engineers as Expert Witnesses and Advisors- Honesty- Moral Leadership- Sample Code of Conduct- ACM, IEEE. Corporate Social Responsibility.

TOTAL: 45 PERIODS

TEXT BOOKS:

1. Mike Martin and Roland Schinzinger, " Ethics in Engineering", McGraw Hill, New York, 2005.
   (UNIT I, UINT II, UNIT V)
2. George Reynolds , "Ethics in Information Technology", THOMSON International Student Edition,2004.

(UNIT III).

3. Deborah G. Johnson " Computer Ethics" Pearson Education, Third Edition ,2004.
   (UNIT –III Y2K Problem).

4. Rinku Sanjeev and Parul Khanna " Ethics and Values in Business Management", Ane`s Student Edition , Ane Books India.(UNIT IV)

5. World Community Service Centre," Vlue Education", Vethathiri Publications, Erode, 2011.

6. William A. Wines Nancy K. Napier "Toward an understanding of cross-cultural ethics: A tentative model", Journal of Business Ethics 11:831-841,2011.
   Link: link.springer.com/content/pdf/10.1007/BF00872361.pdf".

7. Anne Marshall & Suzanne Batten," Ethical Issues in Cross-Cultural Research", Link:
   http://xa.yimg.com/kq/groups/22129499/384089802/name/10Marshall105.pdf.

REFERENCE BOOKS:

1. M.Govindarajan , M. Natarajan and V S Senthil Kumar," Engineering Ethics", PHI Learning, New Delhi,2007.

2. Charles E Harris, Michal S Pritchard And Michael J rabins, " Engineering Ethics Concepts and Cases", Thompson Lerning, New Delhi, 2000

3. Charles D Fleddermann," Engineering Ethics":, Prentice Hall, New Mexico, 1999.

4. John R Boatright," Ethics and the Conduct of Business ", Pearson Education, New Delhi, 2003.

WEB SOURCES:

1   www.onlineethics.org
2   www.nspe.org
3   www.globalethics.org
4   www.ethics.org

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711CSE09	DISTRIBUTED DATABASE	L T P C
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OBJECTIVES:

- A basis for understanding distributed technology in general.
- A Framework for characterizing the functionality of specific distributed systems.
- To learn the fundamentals of distributed database design and Data & Access control.
- To know the fundamental concepts of query processing, decomposition and localization.
- To have an introductory knowledge about parallel database systems.

UNIT-I   9

Introduction: Distributed Data Processing, Distributed Database System, Promises of DDBs's, Complications Introduced by Distribution, Design Issues. Distributed DBMS Architecture: ANSI/SPARC Architecture, A Generic Centralized DBMS Architecture, Architectural Models for Distributed DBMS's, Autonomy, Distribution, Heterogeneity, Architectural Alternatives, Client/Server Systems, Peer-to-Peer systems, Multidatabase System Architecture.

UNIT-II   9

Distributed Database Design: Top-Down Design Process, Distributed Design Issues, Fragmentation, Allocation, Data Directory. Data and Access Control: View Management, Data Security, Semantic Integrity Control.

UNIT-III   9

Overview of Query Processing: Query Processing Problem, Objectives of Query Processing, Complexity of Relational Algebra Operations, Characterization of Query Processors, Layers of Query Processing. Query Decomposition and Data Localization: Query Decomposition, Localization of Distributed Data. Optimization of Distributed Queries: Query Optimization, Centralized Query Optimization, Join ordering in Distributed Queries, Distributed Query Optimization.

UNIT-IV   9

Distributed DBMS Reliability: Reliability Concepts and Measures, Failures in Distributed DBMS, Local Reliability Protocols, Distributed Reliability Protocols, Dealing with Site Failures, Network Partitioning. Parallel Database Systems: Parallel Database System Architectures, Parallel Data Placement, Parallel Query Processing, Load Balancing, Database Clusters.

UNIT-V   9

Distributed Object Database Management: Fundamental Object Concepts and Object Models, Object Distribution Design, Architectural Issues, Object Management, Distributed Object Storage, Object Query Processing, Transaction Management. Current Issues: Streaming Data and Cloud Computing: Data Stream Management, Cloud Data Management.

TEXT BOOKS:

1. M.Tamer Ozsu, Patrick Valduriez "Principles of Distributed Database Systems", Third Edition, November 2010, Springer.
2. Stefano Ceri, Giuseppe Pelagatti, "Distributed Databases Principles and Systems",   McGraw-Hill International Editions, 1985.

PREREQUISITE: Software Engineering

OBJECTIVES:
- Understand the basic view of software quality and quality factors.
- Be exposed to the Software Quality Assurance (SQA) architecture and the details of SQA Components.
- Understand of how the SQA components can be integrated into the project life cycle.
- Be familiar with the software quality infrastructure.
- Be exposed to the management components of software quality.

UNIT I   INTRODUCTION TO SOFTWARE QUALITY & ARCHITECTURE   9

Software Quality Concepts – Software Quality challenges – Software quality assurance (SQA) – Definition and objectives – Software quality factors – SQA system and architecture –Software Project life cycle Components – Pre project quality components.

UNIT II   DEVELOPMENT AND QUALITY PLANS   9

Development plan and quality plan objectives- Elements of the development plan- Elements of the quality plan- Development and quality plans for small projects and for internal projects - Software development risks- Risk management activities and measures- The risk management process.

UNIT III   SQA COMPONENTS AND PROJECT LIFE CYCLE   9

Software Development methodologies – Quality assurance activities in the development process- Verification & Validation – Reviews – **Formal design reviews (FDR) - Peer reviews** – Quality of software maintenance – Pre-Maintenance of software quality components – Software Quality assurance tools – CASE tools for software quality.

UNIT IV   SOFTWARE QUALITY INFRASTRUCTURE   9

Procedures and work instructions - Templates - Checklists – 3S developmenting - Staff training and certification Corrective and preventive actions – Configuration management – Software change control – **Configuration management tasks and organization**- audit -Documentation control – Storage and retrieval.

UNIT V   SOFTWARE QUALITY MANAGEMENT & METRICS   9

Project process control – Computerized tools - Software quality metrics – Objectives of quality measurement – Process metrics – Product metrics – Implementation – Limitations of software metrics – Cost of software quality – Classical quality cost model – Extended model – Application of Cost model.

TOTAL: 45 PERIODS

COURSE OUTCOMES:
At the end of the course the students will be able to:

CO1: Utilize the concepts in software development life cycle.

CO2: Demonstrate their capability to adopt quality standards and assess the quality of software product.

CO3: Apply the concepts in preparing the quality plan & documents.

TEXT BOOK:

1. Daniel Galin, "Software Quality Assurance", Pearson Publication, 2009.

REFERENCES:

1. Alan C. Gillies, "Software Quality: Theory and Management", International Thomson Computer Press, 1997.

2. Mordechai Ben-Menachem "Software Quality: Producing Practical Consistent Software", International Thompson Computer Press, 1997.

3. G. Gordon Schulmeyer "Handbook of Software Quality Assurance", 4th Edison, 2007.

4. Ashfaque Ahmed Software Testing & Quality Assurance, From Traditional to Cloud Computing, CreateSpace Independent Publishing Platform; 1 edition, 2014.

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PREREQUISITE: Software Engineering

OBJECTIVE:
- To introduce the quality management process and key quality management activities
- To explain the role of standards in quality management
- To explain the concept of a software metric, predictor metrics and control metrics
- To explain how measurement may be used in assessing software quality and the limitations of software measurement

UNIT I INTRODUCTION TO SOFTWARE QUALITY   **9**

Software Quality – Hierarchical models of Boehm and McCall – **Quality Models – Quality Criteria and its Interrelation – Fundamentals of Software Quality Improvement – Concepts of Quality Improvement – Concepts of Process Maturity – Improving Process Maturity** – Quality measurement – Metrics measurement and analysis – Gilb's approach – GQM Model.

UNIT II SOFTWARE QUALITY ASSURANCE   **9**

Quality tasks – **Software quality factors – Components of software quality assurance system– Development and quality plans** – Teams – Characteristics – Implementation – Documentation – Reviews and Audits – **SQA components in project life cycle– Integrating quality activities in project life cycle.**

UNIT III QUALITY CONTROL AND RELIABILITY   **9**

Key Measures for Software Engineers – Defects – Productivity and Quality – Measuring and Improving the Development Process – Assigning Measures to Process Elements and Events – Isikawa Diagrams – Metrics for Software Quality – Integrating Metrics within Software Engineering Process – Metrics for Small Organizations – Tools for Quality – Ishikawa's basic tools – CASE tools – Defect prevention and removal.

UNIT IV QUALITY MANAGEMENT SYSTEM   **9**

Elements of QMS –**Reliability, Maintainability, Verifiability, Testability, Safety and Supportability** – Rayleigh model framework – Reliability Growth models for QMS – Complexity metrics and models – Customer satisfaction analysis – **Process – Product – Project– People in Software Development and Management Spectrum – Principle and Critical Practices in QMS** .

UNIT V QUALITY STANDARDS   **9**

Need for standards – ISO 9000 Series – ISO 9000-3 for software development – **ISO 9001 and Capability Maturity Models – Six Sigma, Zero Defects and Statistical Quality Control**– CMM and CMMI methodology – Bootstrap methodology.

                                           TOTAL : 45 Hours

TEXT BOOKS

1. Brian Hambling, "Managing Software Quality", Tata McGraw Hill, 2012.
2. Allan C. Gillies, "Software Quality: Theory and Management", Thomson Learning, 2008.
3. Stephen H. Kan, "Metrics and Models in Software Quality Engineering", Pearson Education (Singapore) Pte Ltd., 2002.

REFERENCES

1. Daniel Galin, " Software Quality Assurance" Pearson Education Limited 2006.
2. Norman E. Fenton and Shari Lawrence Pfleeger, "Software Metrics" Thomson, 2003.
3. Mary Beth Chrissis, Mike Konrad and Sandy Shrum, "CMMI", Pearson Education (Singapore) Pte Ltd, 2003.
4. Roger S. Pressman, "Software Engineering - A Practitioner's Approach", Fifth Edition, McGraw Hill, 2001.

PREREQUISITE: Operating Systems, Open Source Software

OBJECTIVES:
- To perform more sophisticated actions on software by improving testing skills using open source tools.
- To understand concepts of Configuration and Installation of various open source software.

UNIT I   9

Overview of Free/Open Source Software-- Definition of FOSS & GNU, History of GNU/Linux and the Free Software Movement , Advantages of Free Software and GNU/Linux, FOSS usage , trends and potential— global and Indian. GNU/Linux OS installation-- detect hardware, configure disk partitions & file systems and install a GNU/Linux distribution ; **Types of partitions and mount options -- RAID overview** ; PAM authentication ; Introduction to common system configuration files & log files; Configuring networking, basics of TCP/IP networking and routing, connecting to the Internet (through dialup, DSL, Ethernet, leased line).

UNIT II   9

Configuring additional hardware - sound cards, displays & display cards, network cards, modems, USB drives, CD writers ; Understanding the OS boot up process; X Window system configuration and utilities -- configure X windows, detect display devices ; Installing software – from   source code as well as using binary packages. Setting up email servers-- using postfix (SMTP services), courier (IMAP & POP3 services), squirrel mail (web mail services) Setting up file services - using samba (file and authentication services for windows   networks), using NFS (file services for gnu/Linux /Unix networks) ; Setting up proxy   services -- using squid (http / ftp / https proxy services) ; Setting up printer services - using CUPS (print spooler), foomatic (printer database).

UNIT III   9

Setting up a firewall - Using netfilter and ip tables; Using GNU Compiler Collection – GNU compiler tools; the C preprocessor (cpp), the C compiler (gcc) and the C++ compiler (g++), assembler (gas); Understanding build systems -- constructing make files and using make, using autoconf and autogen to automatically generate make files   tailored for different development environments; Using source code versioning and   management tools -- using CVS to manage source code revisions, patch & diff.

UNIT IV   9

Web Server: Apache Web server – Working with Web Server – Configuring and Using apache web services MDA: Introduction to MDA – Genesis of MDA – Meta Object Facility – UML – UML Profiles – MDA Applications.

UNIT V   9

Basics of the X Windows server architecture; Window Managers (KWM), Client Applications, Desktop Environments KDE and GNOME; Qt Programming; Gtk+ Programming, Programming GUI applications with localization support.

                                                          TOTAL HOURS: 45

REFERENCE BOOKS:

1. Stephen J. Mellor, Marc Balces, —Executable UMS: A foundation for MDA , Addison, 2002.
2. N. B. Venkateshwarlu (Ed); Introduction to Linux: Installation and Programming, B S Publishers, 2005.
3. Matt Welsh, Matthias Kalle Dalheimer, Terry Dawson, and Lar Kaufman, Running Linux, Fourth Edition, O'Reilly Publishers, 2002.
4. Carla Schroder, Linux Cookbook, First Edition, O'Reilly Cookbooks Series, 2004.

ONLINE REFERENCES:

1. The Linux Cookbook: Tips and Techniques for Everyday Use, First Edition, Michael Stutz, 2001.URL: http://dsl.org/cookbook/cookbook_toc.html
2. The Linux System Administrator's Guide, http://tldp.org/LDP/sag/html/sag.html
3. TheSoftware-RAIDHOWTO, Jakob Østergaard, http://www.tldp.org/HOWTO/Software-RAID-HOWTO.html
4. The Network Administrators' Guide,Olaf Kirch, http://tldp.org/LDP/nag/nag.html
5. The basics of X windows server architecture, http://www.tldp.org/HOWTO/XWindow-Overview-HOWTO/index.html