



SARVEPALLI RADHAKRISHNAN UNIVERSITY, BHOPAL

Grading Bachelor of Engineering (Information Technology) Scheme of Examination w.e.f. 2016-17 Semester/Year :III /II

S. No.	Subject Code	Subject Name	Maximum Marks Allotted						Hours/Week			Credit	Total Marks
			Theory			Practical			L	T	P		
			End Sem.	Mid Sem	Quiz, Assignment	End Sem	Lab work	Assignment / Quiz					
1	MA-112	MATHEMATICS -III	60	30	10	0	0	0	3	1	0	4	100
2	IT-302	DISCRETE STRUCTURE	60	30	10	0	0	0	3	1	0	4	100
3	IT-303	ELECTRONIC DEVICES & CIRCUITS	60	30	10	20	20	10	3	1	2	5	150
4	IT-304	JAVA	60	30	10	20	20	10	3	1	2	5	150
5	IT-305	DATA STRUCTURES & ALGORITHM	60	30	10	20	20	10	3	1	2	5	150
6	IT-306	HARDWARE INSTALLATION AND MAINTENANCE	0	0	0	50	50	50	0	0	2	1	150
7	IT-307	GD / SEMINAR	0	0	0	0	50	50	0	0	2	1	100
8	IT-308	CRITICAL THINKING	0	0	0	0	50	50	0	0	2	1	100
TOTAL			300	150	50	110	210	180	15	5	12	26	1000

L: Lecture

T:Tutorial

P:Practical

Note: For Sr. no. 7 & 8, there will be no examination and credits will be awarded only on the basis of internal assessment.



SARVEPALLI RADHAKRISHNAN UNIVERSITY, BHOPAL

Grading Bachelor of Engineering (Information Technology) Scheme of Examination w.e.f. 2016-17 Semester/Year :IV /II

S. No.	Subject Code	Subject Name	Maximum Marks Allotted						Hours/Week			Credit	Total Marks
			Theory			Practical			L	T	P		
			End Sem.	Mid Sem	Quiz, Assignment	End Sem	Lab work	Assignment / Quiz					
1	IT-401	DATA COMMUNICATION	60	30	10	0	0	0	3	1	0	4	100
2	IT-402	INFORMATION STORAGE & MANAGEMENT	60	30	10	0	0	0	3	1	0	4	100
3	IT-403	OOPS	60	30	10	20	20	10	3	1	2	5	150
4	IT-404	COMPUTER NETWORK	60	30	10	20	20	10	3	1	2	5	150
5	IT-405	SYSTEM PROGRAMMING & OPERATING SYSTEM	60	30	10	20	20	10	3	1	2	5	150
6	IT-406	DOT NET	0	0	0	50	50	50	0	0	2	1	150
7	IT-407	MENTAL ABILITY APTITUDE	0	0	0	0	50	50	0	0	2	1	100
8	IT-408	PROFESSIONAL ACTIVITIES	0	0	0	0	50	50	0	0	2	1	100
TOTAL			300	150	50	110	210	180	15	5	12	26	1000

L: Lecture

T:Tutorial

P:Practical

Note: For Sr. no. 7 & 8, there will be no examination and credits will be awarded only on the basis of internal assessment.



SARVEPALLI RADHAKRISHNAN UNIVERSITY, BHOPAL

Grading Bachelor of Engineering (Information Technology) Scheme of Examination w.e.f. 2016-17 Semester/Year :V /III

S. No.	Subject Code	Subject Name	Maximum Marks Allotted						Hours/Week			Credit	Total Marks
			Theory			Practical			L	T	P		
			End Sem.	Mid Sem	Quiz, Assignment	End Sem	Lab work	Assignment / Quiz					
1	IT-501	MICRO PROCESSOR AND INTERFACING	60	30	10	20	20	10	3	1	0	4	150
2	IT-502	PRINCIPLES OF PROGRAMMING LANGUAGES	60	30	10	0	0	0	3	1	0	4	100
3	IT-503	ADVANCE DATABASE MANAGEMENT SYSTEM	60	30	10	20	20	10	3	1	2	5	150
4	IT-504	COMPUTER SYSTEM & ORGANIZATION	60	30	10	20	20	10	3	1	2	5	150
5	IT-505	CLOUD COMPUTING	60	30	10	0	0	0	3	1	2	5	100
6	IT-506	INDUSTRIAL TRAINING	0	0	0	50	50	50	0	0	2	1	150
7	IT-507	VALUE EDUCATION	0	0	0	0	50	50	0	0	2	1	100
8	IT-508	UML	0	0	0	0	50	50	0	0	2	1	100
TOTAL			300	150	50	110	210	180	15	5	12	26	1000

L: Lecture

T:Tutorial

P:Practical

Note: For Sr. no. 7 & 8, there will be no examination and credits will be awarded only on the basis of internal assessment.



SARVEPALLI RADHAKRISHNAN UNIVERSITY, BHOPAL

Grading Bachelor of Engineering (Information Technology) Scheme of Examination w.e.f. 2016-17 Semester/Year :VI /III

S. No.	Subject Code	Subject Name	Maximum Marks Allotted						Hours/Week			Credit	Total Marks
			Theory			Practical			L	T	P		
			End Sem.	Mid Sem	Quiz, Assignment	End Sem	Lab work	Assignment / Quiz					
1	IT-601	NETWORK MANAGEMENT	60	30	10	0	0	0	3	1	0	4	100
2	IT-602	AUTOMATA & COMPILER DESIGN	60	30	10	0	0	0	3	1	0	4	100
3	IT-603	SOFTWARE ENGINEERING & PROJECT MANAGERMENTS	60	30	10	20	20	10	3	1	2	5	150
4	IT-604	COMPUTER GRAPHICS & MULTIMEDIA	60	30	10	20	20	10	3	1	2	5	150
5	IT-605	UNIX & SHELL PROGRAMMING	60	30	10	20	20	10	3	1	2	5	150
6	IT-606	ENGINEERING PROJECT(MINOR)	0	0	0	50	50	50	0	0	2	1	150
7	IT-607	MATLAB	0	0	0	0	50	50	0	0	2	1	100
8	IT-608	ETHICS AND VALUES	0	0	0	0	50	50	0	0	2	1	100
TOTAL			300	150	50	110	210	180	15	5	12	26	1000

L: Lecture

T:Tutorial

P:Practical

Note: For Sr. no. 7 & 8, there will be no examination and credits will be awarded only on the basis of internal assessment.



SARVEPALLI RADHAKRISHNAN UNIVERSITY, BHOPAL

Grading Bachelor of Engineering (Information Technology) Scheme of Examination w.e.f. 2016-17 Semester/Year :VII /IV

S. No.	Subject Code	Subject Name	Maximum Marks Allotted						Hours/Week			Credit	Total Marks
			Theory			Practical			L	T	P		
			End Sem.	Mid Sem	Quiz, Assignment	End Sem	Lab work	Assignment / Quiz					
1	IT-701	ELECTIVE-I	60	30	10	0	0	0	3	1	0	4	100
2	IT-702	INFORMATION SECURITY	60	30	10	0	0	0	3	1	0	4	100
3	IT-703	WEB TECHNOLOGY	60	30	10	20	20	10	3	1	2	5	150
4	IT-704	DATA MINING AND WAREHOUSING	60	30	10	20	20	10	3	1	2	5	150
5	IT -705	SOFT COMPUTING	60	30	10	20	20	10	3	1	2	5	150
6	IT-706	MOBILE APPLICATION DEVELOPMENT	0	0	0	50	50	50	0	0	2	1	150
7	IT-707	NETWORK SIMULATOR	0	0	0	0	50	50	0	0	2	1	100
8	IT-708	ERP	0	0	0	0	50	50	0	0	2	1	100
TOTAL			300	150	50	110	210	180	15	5	12	26	1000

L: Lecture

T:Tutorial

P:Practical

Note: For Sr. no. 7 & 8, there will be no examination and credits will be awarded only on the basis of internal assessment.

Elective -I

- IT-7011 Image Processing
- IT-7012 Artificial Intelligence
- IT-7013 E-commerce & Management



SARVEPALLI RADHAKRISHNAN UNIVERSITY, BHOPAL

Grading Bachelor of Engineering (Information Technology) Scheme of Examination w.e.f. 2016-17 Semester/Year :VIII /IV

S. No.	Subject Code	Subject Name	Maximum Marks Allotted						Hours/Week			Credit	Total Marks
			Theory			Practical			L	T	P		
			End Sem.	Mid Sem	Quiz, Assignment	End Sem	Lab work	Assignment / Quiz					
1	IT-801	ENGINEERING PROJECT (MAJOR)	—	—	—	300	150	150			32	16	600
2	IT-802	COMPREHENSIVE VIVA	—	—	—	100	50	50			12	6	200
3	IT- 803	SEMINAR & GROUP DISCUSSION	—	—	—		100	100			8	4	200
TOTAL						400	300	300			52	26	1000

L: Lecture

T:Tutorial

P:Practical



MA-112 - MATHEMATICS-III

Unit I

Functions of complex variables: Analytic functions, Harmonic Conjugate, Cauchy-Riemann Equations, Line Integral, Cauchy's Theorem, Cauchy's Integral Formula, Singular Points, Poles & Residues, Residue Theorem, Application of Residues theorem for evaluation of real integrals

Unit II

Errors & Approximations, Solution of Algebraic & Trancedental Equations (Regula Falsi , Newton-Raphson, Iterative, Secant Method), Solution of simultaneous linear equatins by Gauss Elimination, Gauss Jordan, Crout's methods , Jacobi's and Gauss-Siedel Iterative methods

Unit III

Difference Operators, Interpolation (Newton Forward & Backward Formulae, Central Interpolation Formulae, Lagrange's and divided difference formulae), Numerical Differentiation and Numerical Integration.

Unit IV

Solution of Ordinary Differential Equations(Taylor's Series, Picard's Method, Modified Euler's Method, Runge-Kutta Method, Milne's Predictor & Corrector method), Correlation and Regression, Curve Fitting (Method of Least Square).

Unit V

Concept of Probability : Probability Mass function, Probability density function. Discrete Distribution:

Binomial, Poisson's, Continuous Distribution: Normal Distribution, Exponential Distribution ,Gamma Distribution ,Beta Distribution ,Testing of Hypothesis !:Students t-test, Fisher's z-test, Chi-Square Method

Reference:

- (i) Numerical Methods using Matlab by J.H.Mathews and K.D.Fink, P.H.I.
- (ii) Numerical Methods for Scientific and Engg. Computation by MKJain, Iyengar and RK Jain, New Age International Publication
- (iii) Mathematical Methods by KV Suryanarayan Rao, SCITECH Publication
- (iv) Numerical Methods using Matlab by Yang,Wiley India
- (v) Pobability and Statistics by Ravichandran ,Wiley
- (vi) Mathematical Statistics by George R.,Springer



IT 302 DISCRETE STRUCTURE

Unit-I

Set Theory, Relation, Function, Theorem Proving Techniques : Set Theory: Definition of sets, countable and uncountable sets, Venn Diagrams, proofs of some general identities on sets Relation: Definition, types of relation, composition of relations, Pictorial representation of relation, Equivalence relation, Partial ordering relation, Job-Scheduling problem Function: Definition, type of functions, one to one, into and onto function, inverse function, composition of functions, recursively defined functions, pigeonhole principle. Theorem proving Techniques: Mathematical induction, Proof by contradiction.

Unit-II

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

Unit-III

Propositional Logic: Proposition, First order logic, Basic logical operation, truth tables, tautologies, Contradictions, Algebra of Proposition, logical implications, logical equivalence, predicates, Normal Forms, Universal and existential quantifiers. Introduction to finite state machine Finite state machines as models of physical system equivalence machines, Finite state machines as language recognizers.

Unit-IV

Graph Theory: Introduction and basic terminology of graphs, Planer graphs, Multigraphs and weighted graphs, Isomorphic graphs, Paths, Cycles and connectivity, Shortest path in weighted graph, Introduction to Eulerian paths and circuits, Hamiltonian paths and circuits, Graph coloring, chromatic number, Isomorphism and Homomorphism of graphs.

Unit V

Posets, Hasse Diagram and Lattices: Introduction, ordered set, Hasse diagram of partially, ordered set, isomorphic ordered set, well ordered set, properties of Lattices, bounded and complemented lattices. Combinatorics: Introduction, Permutation and combination, Binomial Theorem, Multinomial Coefficients Recurrence Relation and Generating Function: Introduction to Recurrence Relation and Recursive algorithms , Linear recurrence relations with constant coefficients, Homogeneous solutions, Particular solutions, Total solutions , Generating functions , Solution by method of generating functions,

References:

1. C.L.Liu, "Elements of Discrete Mathematics" Tata Mc Graw-Hill Edition.
2. Trembley, J.P & Manohar; "Discrete Mathematical Structure with Application CS", McGraw Hill.
3. Kenneth H. Rosen, "Discrete Mathematics and its applications", McGraw Hill.
4. Lipschutz; Discrete mathematics (Schaum); TMH
5. Deo, Narsingh, "Graph Theory With application to Engineering and Computer.Science.", PHI.
6. Krishnamurthy V; "Combinatorics Theory & Application", East-West Press Pvt. Ltd., New Delhi.
7. S k Sarkar " Discrete Mathematics", S. Chand Pub



IT 303 ELECTRONICS DEVICES & CIRCUITS

Unit I

Semiconductor device, theory of P-N junction, temperature dependence and break down characteristics, junction capacitances. Zener diode, Varactor diode, PIN diode, LED, Photo diode, Transistors BJT, FET, MOSFET, types, working principal, characteristics, and region of operation, load line biasing method. Transistor as an amplifier, gain, bandwidth, frequency response, h- parameters equivalent, type of amplifier.

Unit II

Feedback amplifier, negative feedback, voltage-series, voltage shunt, current series and current shunt feedback, Sinusoidal oscillators, L-C (Hartley-Colpitts) oscillators, RC phase shift, Wien bridge, and Crystal oscillators. Power amplifiers, class A, class B, class A B, C amplifiers, their efficiency and power Dissipation.

Unit III

Switching characteristics of diode and transistor, turn ON, OFF time, reverse recovery time, transistor as switch, Multivibrators, Bistable, Monostable, Astable multivibrators. Clippers and clampers, Differential amplifier, calculation of differential, common mode gain and CMRR using hparameters, Darlington pair, Boot strapping technique. Cascade and cascode amplifier.

Unit IV

Operational amplifier characteristics, slew rate, full power bandwidth, offset voltage, bias current, application ,inverting , non inverting amplifier , summer , averager , differentiator, integrator, differential amplifier , instrumentation amplifier , log and antilog amplifier , voltage to current and current to voltage converters , comparators Schmitt trigger , active filters, 555 timer and its application.

Unit V

Regulated power supplies., Series and shunt regulators, current limiting circuits, Introduction to IC voltage regulators, fixed and adjustable switching regulators, SMPS ,UPS

References:

1. Milliman Hallkias - Integrated Electronics; TMH Pub.
2. Gayakwad; OP-amp and linear Integrated Circuits; Pearson Education
3. Salivahanan; Electronic devices and circuits; TMH
4. Salivahanan; Linear Integrated Circuits; TMH-
5. Miliman Grabel; Micro electronics , TMH
6. RobertBoylestad & Nashetsky; Electronics Devices and circuit Theory; Pearson Ed.

List of Experiments :

1. Diode and Transistor characteristics
2. Transistor Applications (Amplifier and switching)
3. OP-Amp and its Applications
4. 555 timer and its Applications



IT 304 JAVA TECHNOLOGY

UNIT-I

Basic Java Features - C++ Vs JAVA, JAVA virtual machine, Constant & Variables, Data Types, Class, Methods, Objects, Strings and Arrays, Type Casting, Operators, Precedence relations, Control Statements, Exception Handling, File and Streams, Visibility, Constructors, Operator and Methods Overloading, Static Members, Inheritance: Polymorphism, Abstract methods and Classes

UNIT-II

Java Collective Frame Work - Data Structures: Introduction, Type-Wrapper Classes for Primitive Types, Dynamic Memory Allocation, Linked List, Stack, Queues, Trees, Generics: Introduction, Overloading Generic Methods, Generic Classes, Collections: Interface Collection and Class Collections, Lists, Array List and Iterator, Linked List, Vector.

Collections Algorithms: Algorithm sorts, Algorithm shuffle, Algorithms reverse, fill, copy, max and min Algorithm binary Search, Algorithms add All, Stack Class of Package java. Util, Class Priority Queue and Interface Queue, Maps, Properties Class, Un-modifiable Collections.

UNIT-III

Advance Java Features - Multithreading: Thread States, Priorities and Thread Scheduling, Life Cycle of a Thread, Thread Synchronization, Creating and Executing Threads, Multithreading with GUI, Monitors and Monitor Locks. Networking: Manipulating URLs, Reading a file on a Web Server, Socket programming, Security and the Network, RMI, Networking, Accessing Databases with JDBC: Relational Database, SQL, MySQL, Oracle

UNIT-IV

Advance Java Technologies - Servlets: Overview and Architecture, Setting Up the Apache Tomcat Server, Handling HTTP get Requests, Deploying a web Application, Multitier Applications, Using JDBC from a Servlet, Java Server Pages (JSP): Overview, First JSP Example, Implicit Objects, Scripting, Standard Actions, Directives, Multimedia: Applets and Application: Loading, Displaying and Scaling Images, Animating a Series of Images, Loading and playing Audio clips

UNIT-V

Advance Web/Internet Programming (Overview): J2ME, J2EE, EJB, XML.

References:

1. Deitel & Deitel, "JAVA, How to Program"; PHI, Pearson.
2. E. Balaguruswamy, "Programming In Java"; TMH Publications
3. The Complete Reference: Herbert Schildt, TMH
4. Peter Norton, "Peter Norton Guide To Java Programming", Techmedia.
5. Merlin Hughes, et al; [Java Network Programming](#) , Manning Publications/Prentice Hall
6. Cay Horstmann, Big JAVA, Wiely India.



List of Program to be perform

1. Installation of J2SDK
2. Write a program to show Scope of Variables
3. Write a program to show Concept of CLASS in JAVA
4. Write a program to show Type Casting in JAVA
5. Write a program to show How Exception Handling is in JAVA
6. Write a Program to show Inheritance
7. Write a program to show Polymorphism
8. Write a program to show Access Specifiers (Public, Private, Protected) in JAVA
9. Write a program to show use and Advantages of CONSTRUCTOR
10. Write a program to show Interfacing between two classes
11. Write a program to Add a Class to a Package
12. Write a program to show Life Cycle of a Thread
13. Write a program to demonstrate AWT.
14. Write a program to Hide a Class
15. Write a Program to show Data Base Connectivity Using JAVA
16. Write a Program to show “HELLO JAVA ” in Explorer using Applet
17. Write a Program to show Connectivity using JDBC
18. Write a program to demonstrate multithreading using Java.
19. Write a program to demonstrate applet life cycle.
20. Write a program to demonstrate concept of servlet.



IT 305 DATA STRUCTURE & ALGORITHM

Unit I

Introduction: Basic Terminology, Data types and its classification, Algorithm complexity notations like big O, Array Definition, Representation and Analysis of Arrays, Single and Multidimensional Arrays, Address calculation, Array as Parameters, Ordered List and operations, Sparse Matrices, Storage pools, Garbage collection. Recursion-definition and processes, simulating recursion, Backtracking, Recursive algorithms, Tail recursion, Removal of recursion. Tower of Hanoi Problem.

UNIT II

Stack, Array Implementation of stack, Linked Representation of Stack, Application of stack: Conversion of Infix to Prefix and Postfix Expressions and Expression evaluation, Queue, Array and linked implementation of queues, Circular queues, D-queues and Priority Queues. Linked list, Implementation of Singly Linked List, Two- way Header List, Doubly linked list, Linked List in Array. Generalized linked list, Application: Garbage collection and compaction, Polynomial Arithmetic.

UNIT III

Trees: Basic terminology, Binary Trees, , algebraic Expressions, Complete Binary Tree, Extended Binary Trees, Array and Linked Representation of Binary trees, Traversing Binary trees, Threaded Binary trees, Binary Search Tree (BST), AVL Trees, B-trees. Application: Algebraic Expression, Huffman coding Algorithm.

UNIT IV

Internal and External sorting ,Insertion Sort, Bubble Sort, selection sort Quick Sort, Merge Sort, Heap Sort, Radix sort, Searching & Hashing: Sequential search, binary search, Hash Table, Hash Functions, Collision Resolution Strategies, Hash Table Implementation. Symbol Table, Static tree table, Dynamic Tree table.

Unit V

Graphs: Introduction, Sequential Representations of Graphs, Adjacency Matrices, Traversal, Connected Component and Spanning Trees, Minimum Cost Spanning Trees.

Reference:

1. R. Kruse et al, "Data Structures and Program Design in C", Pearson Education Asia, Delhi-2002ISRD Group; Data structures using C; TMH
2. Horowitz and Sahani, "Fundamentals of data Structures", Galgotia Publication Pvt. Ltd., N Delhi.
3. A M. Tenenbaum, "Data Structures using C & C++", Prentice-Hall of India Pvt. Ltd., New Delhi.
4. Data Structures Trembley and Sorenson, TMH Publications
5. Pai; Data structure and algorithm; TMH
6. Introduction to Algorithm- Corman, AWL
7. Lipschutz; Data structure (Schaum); TMH

List of Experiments:

Programs in C relating to different theory units.



IT 306 HARDWARE INSTTALATION AND MAINTENANCE

PURPOSE

This course is designed to enable the students to get a detailed knowledge of all the hardware components that make up a computer and to understand the different interfaces required for connecting these hardware devices.

INSTRUCTIONAL OBJECTIVES

1. Understand the components on the motherboard
2. Perform system administration tasks
3. Understand different storage media
4. Understand system related problems and methods of troubleshooting

LIST OF EXPERIMENTS

1. Study and Identification of standard desktop personal computer
2. Understanding of Motherboard and its interfacing components
3. Install and configure computer drivers and system components.
4. Disk formatting, partitioning and Disk operating system commands
5. Install, upgrade and configure Windows operating systems.
6. Remote desktop connections and file sharing.
7. Identify, Install and manage network connections Configuring IP address and Domain name system
8. Install, upgrade and configure Linux operating systems.
9. Installation Antivirus and configure the antivirus.
10. Installation of printer and scanner software.
11. Disassembly and Reassembly of hardware.
12. Trouble shooting and Managing Systems

REFERENCES

1. Craig Zacker & John Rourke, "*The complete reference : PC hardware*", Tata McGraw- Hill, New Delhi, 2001.
2. Mike Meyers, "*Introduction to PC Hardware and Troubleshooting*", Tata McGraw-Hill, New Delhi, 2003.
3. Govindarajulu B., "*IBM PC and Clones hardware trouble shooting and maintenance*", Tata McGraw-Hill, New Delhi, 2002.



IT-307 GROUP DISCUSSION /SEMINAR

Objective of GD and seminar is to improve the MASS COMMUNICATION and CONVINCING/ understanding skills of students and it is to give student an opportunity to exercise their rights to express themselves.

Evaluation will be done by assigned faculty based on group discussion and power point presentation.



IT 308 CRITICAL THINKING

- What is critical thinking?
- Claims, issues, and arguments
- Argument structure
- Ways to be imprecise
- Evaluating claims
- Arguing fairly
- Consistency and contradiction
- Deductive logic
- Explanations
- Inductive Arguments
- Scientific reasoning



IT- 401 – DATA COMMUNICATION

Unit I

Data and signal-Analog and digital signals, Time and frequency domain, Composite signals, - Bandwidth, bit rate, bit length, Baseband and broadband transmission, Attenuation, distortion, noise, Nyquist bit rate, Shannon capacity, Throughput, delay, Jitter, Bandwidth delay product.

Unit II

Data communication concepts – Data transmission – Parallel and serial transmission, synchronous, and Asynchronous transmission, Simplex, half duplex and full duplex, unipolar and polar line codes, Non return to zero codes, return to zero codes, bipolar line codes, bauds, modem, Line configurations-Point to point and point to multipoint configuration.

Unit III

Telephone Network-Network topology, signaling- SS7, dial-up modems, modem standard, digital subscriber line – ADSL, SDSL, VDSL. Multiplexing, Frequency division multiplexing, time division multiplexing and wavelength division multiplexing, pulse code modulation, pleisochronous digital hierarchy (PDH), synchronous digital hierarchy (SDH), STM -1 frame, virtual container, mapping of data signals on STM- 1.

Unit IV

Switching techniques- Circuit, packet and hybrid switching, Types of error, single bit error, burst error, Error detection, Vertical redundancy check, Longitudinal redundancy check, cyclic redundancy check, error correction, Integrated services digital network, ISDN interface, ISDN devices, reference points, ISDN services, ISDN Protocols

Unit V

Transmission media-Guided and unguided media, twisted pair, Unshielded twisted pair and Shielded twisted pair, coaxial cable and fiber optic cable, radio waves, microwaves and infrared transmission RJ- 45, Network interface card, rack, cable standard-Category 5, 6, and 7, cross connection, straight connection cable coding standards.

References:-

1. “Data communication and networking”, Forouzan, TMH 4 th edition
2. Data communication and Computer Networks, Prakash C Gupta, PHI Learning
3. “Computer Networks” - Tanenbaum, PHI Learning.
4. “Communication Networks-Fundamental concepts and key
5. “Computer Communications & Networking Technologies”-Michael A. Gallo & William M. Hancock -Cengage pearson publications
6. “Network for computer scientists & engineers” –Youlu zheng & shakil akhtar, Oxford pub.



IT- 402 – INFORMATION STORAGE AND MANAGEMENT

Unit-I

Introduction to Storage Technology: Data proliferation, evolution of various storage technologies, Overview of storage infrastructure components, Information Lifecycle Management, Data categorization.

Unit-II

Storage Systems Architecture: Intelligent disk subsystems overview, Contrast of integrated vs. modular arrays, Component architecture of intelligent disk subsystems, Disk physical structure components, properties, performance, and specifications, RAID levels & parity algorithms, hot sparing, Front end to host storage provisioning, mapping and operation.

Unit-III

Introduction to Networked Storage: JBOD, DAS, NAS, SAN & CAS evolution and comparison. Applications, Elements, connectivity, standards, management, security and limitations of DAS, NAS, CAS & SAN.

Unit –IV

Hybrid Storage solutions; Virtualization: Memory, network, server, storage appliances. Data center concepts & requirements, Backup & Disaster Recovery: Principles Managing & Monitoring: Industry management standards (SNMP, SMI-S, CIM), standard framework applications, Key management metrics (Thresholds, availability, capacity, security, performance).

Unit-V

Information storage on cloud :Concept of Cloud, Cloud Computing, storage on Cloud, Cloud Vocabulary, Architectural Framework, Cloud benefits, Cloud computing Evolution, Applications & services on cloud, Cloud service providers and Models, Essential characteristics of cloud computing, Cloud Security and integration.

References:

1. G. Somasundaram & Alok Shrivastava (EMC Education Services) editors; Information Storage and Management: Storing, Managing, and Protecting Digital Information; Wiley India.
2. Ulf Troppens, Wolfgang Mueller-Friedt, Rainer Erkens, Rainer Wolafka, Nils Haustein; Storage Network explained : Basic and application of fiber channels, SAN, NAS, iSESI, INFINIBAND and FCOE, Wiley India.
3. John W. Rittinghouse and James F. Ransome; Cloud Computing : Implementation , Management and Security, CRC Press, Taylor Frances Pub.
4. Nick Antonopoulos, Lee Gillam; Cloud Computing : Principles, System & Application, Springer.
5. Anthony T. Velete, Toby J.Velk, and Robert Eltenpeter, Cloud Computing : A practical Approach, TMH Pub.
6. Saurabh , Cloud Computing : Insight into New Era Infrastructure, Wiley India.
7. Sosinsky, Cloud Computing Bible, Wiley India.
8. Rich Schiesser, IT Systems Management :Designing, Implementing and Managing World- class Infrastructures, PHI Learning



IT 403 OOPS METHODOLOGY

Unit I

Introduction, Object Oriented Programming Concepts, Flow chart, Objects, Objects as software modules, Objects interaction, Classes, Method lookup, Hierarchies of classes, Inheritance, Polymorphism, Abstract classes.

Unit II

Identifying objects and classes, Representation of objects, Modeling, objects and classes, Relationships. Association between objects, aggregate components of objects. Storage Management :Memory allocation, Dynamic allocation.

Unit III

Object oriented programming languages, Class declarations, Object declarations, Mandatory profiles, Message sending, Association, Recursive association, Many to many association, Argument passing.

Unit IV

Inherited methods, Redefined methods, The protected interface, Abstract base classes, Public and protected properties, Private operations, Disinheritance, Multiple inheritance.

Unit V

Study of C++ as object oriented programming language.

References:

1. Object oriented programming in C++ by Robert Lafore.
2. J. Rumbaugh, Object-Oriented Modeling and Design using UML, Pearson Education.
3. Balagurusamy; Object oriented programming with C++; TMH
4. Rajesh K Shukla, Object Oriented Programming by C++, Wiley, India
5. Kahate A; Object oriented analysis and design; TMH
6. Ken Barclay, Object oriented design with C++.
7. Kamthane, "Object Oriented Programming using Turbo C++", Pearson Education
8. Josuttis, Object Oriented Programming With C++, Wiley, India

List of experiments :

Programming assignments may be given to students so that they can better understand the concepts of object oriented programming such as objects, classes, inheritance, polymorphism etc.



IT- 404 COMPUTER NETWORKS

Unit I

Importance of computer networks, broadcast and point to point networks, Local area networks and Wide area networks , Introduction to ISO-OSI reference model, TCP/IP reference model , function of each layer, interfaces and services, Protocol data unit, connection oriented and connectionless services, service primitives, comparison of TCP/IP and ISO-OSI reference model, Novel Netware, Arpanet , X.25

Unit II

Data-Link layer: - Data link layer design issues, framing , flow & error control , physical addressing, Stop & Wait protocol , Go back N ARQ , selective repeat ARQ , piggybacking and pipelining , HDLC LAN Protocol stack- Logical link control and Media Access Control sublayer, IEEE 802.2 LLC Frame format Data link layer in the internet, Serial line IP and Point to point protocol.

Unit III

MAC layer Protocols- , static and dynamic allocation , Pure and slotted ALOHA protocols, Carrier sense multiple access, Persistent and non persistent CSMA, IEEE standard 802.3 and Ethernet, 802.3 cabling, IEEE 802.4, IEEE 802.5, FDDI Wireless LAN , Comparison of wired and wireless LAN, WIMAX.

Unit IV

The Network layer - logical addressing, classful & classless addressing , address mapping , packet delivery & forwarding. unicast routing protocols , multicast routing protocols, Routing algorithm- Least Cost, Dijkstra's, Bellman-ford, congestion control algorithms, Internetworking devices, Introduction to Internet protocol IPv4.

Unit V

Transport layer-Transport services , Process to process delivery, UDP ,TCP , congestion control , quality of service , Integrated services, Differentiated services LAN-WAN Design and implementation-Configuring TCP/IP, using Ipconfig, ping command study of structured LAN , study of internetworking devices and their configuration- switches, hubs, Bridges, routers and Gateways.

References:-

1. "Local area networks ", Forouzan, TMH, 1st edition
2. "Computer Networks" - Tanenbaum , PHI Learning.
3. Computer Networks: Protocols, Standards and Interfaces By Black, PHI learning
4. "Computer Communications & Networking Technologies"-Michael A. Gallo & William M. Hancock -Cengage publishers



Suggested List of Experiment

1. Establishment and configuration of LAN
2. Colour coding standard of CAT 5,6,7 and crimping of cable in RJ-45
3. Study of WAN
4. Case study of STOP AND WAIT Protocols
5. Study of sliding window protocol
6. study of IEEE 802.3 , 802.4 ,802.5
7. Study of FDDI
8. Study of basic networking commands like ping, ipconfig, etc
9. Case study of various Routing Strategies
10. Case studies of various Network Topologies
11. Establishing & studying the various parameters of a home LAN Network
12. Study of IOS of routers
13. Configuring routers, bridges and switches and gateways.



IT- 405 – SYSTEM PROGRAMMING AND OPERATING SYSTEM

Unit I

Introduction Language Processors, Language Processing Activities and Language Processors Development Tools, Assemblers, Compiler, Macros and Macro Processors, Linkers, Software Tools . Introduction to Operating Systems, Types of operating Systems, system protection, Operating system services.

Unit II

Basic concepts of CPU scheduling, Scheduling criteria, Scheduling algorithms, algorithm evaluation, multiple processor scheduling. Process concept, operations on processes, threads, interprocess communication, precedence graphs, critical section problem, semaphores, classical problems of synchronization,

Unit III

Deadlock problem, deadlock characterization, deadlock prevention, deadlock avoidance, deadlock detection, recovery from deadlock, Methods for deadlock handling. Concepts of memory management, logical and physical address space, swapping, Fixed and Dynamic Partitions, Best -Fit, First-Fit and Worst Fit Allocation, paging, segmentation, and paging combined with segmentation.

Unit IV

Concepts of virtual memory, Cache Memory Organization, demand paging, page replacement algorithms, allocation of frames, thrashing, demand segmentation, Role of Operating System in Security, Security Breaches, System Protection, and Password Managment.

Unit V

Disk scheduling, file concepts, File manager, File organization, access methods, allocation methods, free space managements, directory systems, file protection, file organization & access mechanism, file sharing implement issue, File Management in Linux, introduction to distributed systems.

References:

1. M. Flynn “ Operating Systems”. Cengage Learning.
2. Silberschatz ,”Operating system”, Willey Pub
3. Tanenbaum “ Modern Operating System” PHI Learning.
4. Dhamdhere, ”System Programming and Operating System”,TMH.
5. Stuart,”Operating System Principles, Design & Applications”,Cengage Learning
6. Operating System : Principle and Design by Pabitra Pal Choudhury, PHI Learning



Suggested List of Experiment

1. Program to implement FCFS CPU scheduling algorithm.
2. Program to implement SJF CPU scheduling algorithm.
3. Program to implement Priority CPU Scheduling algorithm.
4. Program to implement Round Robin CPU scheduling algorithm.
5. Program to implement classical inter process communication problem(producer consumer).
6. Program to implement classical inter process communication problem(Reader Writers).
7. Program to implement classical inter process communication problem(Dining Philosophers).
8. Program to implement FIFO, LRU , LFU , optimal page replacement algorithm.



IT- 406 – DOT NET

UNIT I

Introduction .NET framework, features of .Net framework, architecture and component of .Net, elements of .Net.

UNIT II

Basic Features Of C# Fundamentals, Classes and Objects, Inheritance and Polymorphism, Operator Overloading, Structures. **Advanced Features Of C#** Interfaces, Arrays, Indexers and Collections; Strings and Regular Expressions, Handling Exceptions, Delegates and Events.

UNIT III

Installing ASP.NET framework, overview of the ASP .net framework, overview of CLR, class library, overview of ASP.net control, understanding HTML controls, study of standard controls, validations controls, rich controls. **Windows Forms:** All about windows form, MDI form, creating windows applications, adding controls to forms, handling Events, and using various Tolls.

UNIT IV

Understanding and handling controls events, **ADO.NET-** Component object model, ODBC, OLEDB, and SQL connected mode, disconnected mode, dataset, data-reader **Data base controls:** Overview of data access data control, using grid view controls, using details view and frame view controls, ado .net data readers, SQL data source control, object data source control, site map data source.

UNIT V XML:

Introducing XML, Structure, and syntax of XML, document type definition (DTD), XML Schema, Document object model, Presenting and Handling XML. xml data source, using navigation controls, introduction of web parts, using java script, Web Services

References:

1. C# for Programmers by Harvey Deitel, Paul Deitel, Pearson Education
2. Balagurusamy; Programming in C#; TMH
3. Web Commerce Technology Handbook by Daniel Minoli, Emma Minoli , TMH
4. Web Programming by Chris Bates, Wiley
5. XML Bible by Elliotte Rusty Harold ,
6. ASP .Net Complete Reference by McDonald, TMH.
7. ADO .Net Complete Reference by Odey, TMH



List of program :

1. Working with call backs and delegates in C#
2. Code access security with C#.
3. Creating a COM+ component with C#.
4. Creating a Windows Service with C#
5. Interacting with a Windows Service with C#
6. Using Reflection in C#
7. Sending Mail and SMTP Mail and C#
8. Perform String Manipulation with the String Builder and String Classes and C#:
9. Using the System .Net Web Client to Retrieve or Upload Data with C#
10. Reading and Writing XML Documents with the XML Text-Reader/-Writer Class and C#
11. Working with Page using ASP .Net.
12. Working with Forms using ASP .Net
13. Data Sources access through ADO.Net,
14. Working with Data readers , Transactions
15. Creating Web Application.



IT 407 MENTAL ABILITY APTITUDE

- Analogy
- Classification
- Series
- Coding-Decoding
- Blood Relations
- Direction Sense Test
- Logical Venn Diagrams
- Alphabet Test
- Sitting Arrangements
- Mathematical Operations
- Arithmetical Reasoning
- Inserting the Missing Character
- Number, Ranking and Time Sequence Test
- Eligibility Test



IT 408 PROFESSIONAL ACTIVITIES

Professional Activity can include but is not limited to the following.

- Active participation in professional and learned societies
- Attending conferences or seminars
- Chairing conference sessions
- Membership in professional and learned societies
- Organizing conferences or serving on conference committees
- Organizing sessions within conferences
- Serving as a peer reviewer or juror for journals, granting agencies, productions, etc.



IT 501 MICRO PROCESSOR AND INTERFACING

Unit-I

Microprocessor and Microprocessor Development Systems: Evolution of Microprocessor, Microprocessor architecture and its operations, memory, inputs-outputs (I/Os), data transfer schemes interfacing devices, architecture advancements of microprocessors, Typical microprocessor development system.

Unit-II

8085 Microprocessor : Architecture of 8085 microprocessor ,Instruction set and Addressing modes of 8085 microprocessor,Assembly language programs of 8085 microprocessor, Stack, Subroutines, Time-Delay loops, Modular programming, Macro .

Unit-III

8086 Microprocessor : Architecture , Registers ,Memory Segmentation ,8086 Memory Addressing ,Memory Read and Write Bus Cycle of 8086, Demultiplexing of the system Bus in 8086 and 8088 microprocessors, Instruction set and Addressing modes of 8086 microprocessor ,Assembly language programs of 8086 microprocessor.

Unit-IV

I/O and Memory Interfacing Using 8085/8086: memory interfacing, Interrupts of 8085/8086 Microprocessors, 8259A Programmable Interrupt Controller, Programmable peripheral Interface, 8253 Programmable Counter/Interval Timer.

Communication and Bus Interfacing with 8085/8086 Microprocessor :Serial Communication Interface, DMA Controller 8257, 8279-Programmable Keyboard and Display I/O Interface, Bus Interface,8089 I/O processor

Unit-V

8051 Microcontroller: Architecture of 8051 microcontroller, Memory organization, Timers/Counters, Interrupts, Addressing modes, 8051 Instruction set , Assembly language Programs, Applications of microcontrollers.

Reference:

1. Douglas V Hall, “Microprocessors and interfacing – Programming & Hardware” TMH
2. Gaonkar, “Microprocessor Architecture, Programming & Applications with 8085”, TMH Grading System 2013 - 14
3. Rafiqzaman, “Microprocessors-Theory & Applications”, PHI
4. Savaliya, “8086 Programming & Advance Processor Architecture”, Wiley India
5. Ray, Bhurchandi, “Advanced Microprocessor and peripherals” TMH Pub
6. Soumitra Kumar Mandal, “Microprocessors and Microcontroller” TMH Pub



IT 502 PRINCIPLES OF PROGRAMMING LANGUAGES

UNIT-I

Language Evaluation Criteria, influences on Language design, Language categories, Programming Paradigms – Imperative, Object Oriented, functional Programming , Logic Programming. Programming Language Implementation – Compilation and Virtual Machines, programming environments. Issues in Language Translation: Syntax, Semantics, Stages, analysis and synthesis, Parse Tree, CFG and BNF grammar.

UNIT-II

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

UNIT-III

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

UNIT-IV

Abstract Data types: Abstractions and encapsulation, introductions to data abstraction, Static and Stack-Based Storage management. heap based storage management. Garbage Collection. object oriented programming in small talk, C++, Java, C#, PHP, Perl . Concurrency: Subprogram level concurrency, semaphores, monitors, message passing, Java threads, C# threads.

UNIT – V

Exception handling, Exceptions, exception Propagation, Exception handler in C++ and Java. Logic Programming Language : Introduction and overview of logic programming, basic elements of prolog, application of logic programming. Functional Programming Languages: Introduction, fundamentals. Introduction to 4GL.

References:

1. Sebesta, "Concept of programming Language", Pearson Edu.
2. Louden, "Programming Languages: Principles & Practices" , Cengage Learning
3. Tucker, " Programming Languages: Principles and paradigms ", Tata McGraw –Hill
4. Terrance W Pratt, "Programming Languages: Design and Implementation" Pearson Edu.
5. Cavlo Ghezzi & Mehdi Jazayeri " Programming Languages Concepts", Willey India
6. E Horowitz, "Programming Languages", 2nd Edition, Addison Wesley



IT- 503 – ADVANCE DATABASE MANAGEMENT SYSTEM

Unit 1

Basic Concepts: DBMS Concepts and architecture Introduction, Review of file organization techniques, Database approach v/s Traditional file accessing approach, Advantages of database systems, Data models, Schemas and instances, Data independence, Functions of DBA and design- er. Entities and attributes, Entity types, Value, Sets, Key attributes, Relationships, Defining the E-R diagram of database,

Unit 2:

Data models and Relational Databases Various data models, Basic concepts of Hierarchical data model, Network data model, and Relational data model, Comparison between the three types of models, Relational Data models: Domains, Tuples, Attributes, Relations, Characteristics of relations, Keys, Key attributes of relation, Relational database, Schemas, Integrity constraints, Intension and Extension,

Unit 3:

Structured Query Language Relational Query languages: Relational algebra and relational calculus, Relational algebra operations like select, Project, Join, Division, outer union. **SQL:** Data definition in SQL, update statements and views in SQL QUEL & QBE: Data storage and definitions, Data retrieval queries and update statements.

Unit 4:

Database Design Data Base Design: Introduction to normalization, Normal forms, Functional de- pendency, Decomposition, Dependency preservation and lossless join, problems with null valued and dangling tuples, multi-valued dependencies.

Unit 5:

Advance Concepts: Introduction to: Distributed databases, protection, security and integrity constraints, concurrent operation on databases, recovery and transaction processing, basic concepts of object oriented data base system and design.

References:

1. Elmasri, Navathe, “Fundamentals Of Database Systems”, Addison Wesley
2. Korth, Silbertz, Sudarshan, “Database Concepts”, McGraw Hill
3. Toledo; Data base management systems; TMH
4. Panneeselvam “Database Management System” PHI
5. Date C J, “An Introduction To Database System”, Addison Wesley
6. Majumdar ; DBMS; TMH
7. Fundamental of Data Base Management System by Leon & Leon, TMH
8. Oracle 9i Database Administration fundamental – I, volume 1, Oracle Press.



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Suggested list of experiments:

In this subject the students are supposed to prepare a small database application in complete semester like financial accounting system, Railway reservation system, institute time-table management system, student record system, library management system, hospital management system in RDBMS (preferably ORACLE 9i 10g).



IT- 504 – COMPUTER SYSTEM & ORGANIZATION

Unit I

Computer Basics and CPU: Von Newman model, various subsystems, CPU, Memory, I/O, System Bus, CPU and Memory registers, Program Counter, Accumulator, Instruction register, Micro operations, Register Transfer Language, Instruction Fetch, decode and execution, data movement and manipulation, Instruction formats and addressing modes of basic computer. 8085 microprocessor organization

Unit-II

Control Unit Organization: Hardwired control unit, Micro and nano programmed control unit, Control Memory, Address Sequencing, Micro Instruction formats, Micro program sequencer, Microprogramming, Arithmetic and Logic Unit: Arithmetic Processor, Addition, subtraction, multiplication and division, Floating point and decimal arithmetic and arithmetic units, design of arithmetic unit.

Unit-III

Input Output Organization: Modes of data transfer – program controlled, interrupt driven and Direct memory access, Interrupt structures, I/O Interface, Asynchronous data transfer, I/O processor, 8085 I/O structure, 8085 instruction set and basic programming. Data transfer – Serial / parallel, synchronous/asynchronous, simplex/half duplex and full duplex.

Unit-IV

Memory organization: Memory Maps, Memory Hierarchy, Cache Memory - Organization and mappings. Associative memory, Virtual memory, Memory Management Hardware.

Unit V

Multiprocessors: Pipeline and Vector processing, Instruction and arithmetic pipelines, Vector and array processors, Interconnection structure and inter-processor communication.

References:

1. Morris Mano: Computer System Architecture, PHI.
2. Tanenbaum: Structured Computer Organization, Pearson Education
3. J P Hayes, Computer Architecture and Organisations, Mc- Graw Hills, New Delhi
4. Gaonkar: Microprocessor Architecture, Programming, Applications with 8085; Penram Int.
5. William Stallings: Computer Organization and Architecture, PHI
6. ISRD group; Computer orgOrganization; TMH
7. Carter; Computer Architecture (Schaum); TMH
8. Carl Hamacher: Computer Organization, TMH



IT- 505 – CLOUD COMPUTING

Unit-I

Introduction: Historical development ,Vision of Cloud Computing, Characteristics of cloud computing as per NIST , Cloud computing reference model ,Cloud computing environments, Cloud services requirements, Cloud and dynamic infrastructure, Cloud Adoption and rudiments .Overview of cloud applications: ECG Analysis in the cloud, Protein structure prediction, Gene Expression Data Analysis ,Satellite Image Processing ,CRM and ERP ,Social networking .

Unit-II

Cloud Computing Architecture: Cloud Reference Model, Types of Clouds, Cloud Interoperability & Standards, Scalability and Fault Tolerance.

Cloud Solutions: Cloud Ecosystem, Cloud Business Process Management, Cloud Service Management.

Cloud Offerings: Cloud Analytics, Testing Under Control, Virtual Desktop Infrastructure.

Unit –III

Cloud Management & Virtualization Technology: Resiliency, Provisioning, Asset management, Concepts of Map reduce, Cloud Governance, High Availability and Disaster Recovery. Virtualization: Fundamental concepts of compute ,storage, networking, desktop and application virtualization .Virtualization benefits, server virtualization, Block and file level storage virtualization Hypervisor management software, Infrastructure Requirements , Virtual LAN(VLAN) and Virtual SAN(VSAN) and their benefits .

Unit-IV

Cloud Security: Cloud Information security fundamentals, Cloud security services, Design principles, Secure Cloud Software Requirements, Policy Implementation, Cloud Computing Security Challenges, Virtualization security Management, Cloud Computing Security Architecture.

Unit-V

Market Based Management of Clouds , Federated Clouds/Inter Cloud: Characterization & Definition ,Cloud Federation Stack , Third Party Cloud Services .

Case study: Google App Engine, Microsoft Azure, Hadoop , Amazon , Aneka

List of Experiments:

1. Installation and configuration of Hadoop/Euceliptus etc.
2. Service deployment & Usage over cloud.
3. Management of cloud resources.
4. Using existing cloud characteristics & Service models.
5. Cloud Security Management.
6. Performance evaluation of services over cloud.



Recommended Text:

1. Buyya, Selvi ,” Mastering Cloud Computing “,TMH Pub
2. Kumar Saurabh, “Cloud Computing” , Wiley Pub
3. Krutz , Vines, “Cloud Security “ , Wiley Pub
4. Velte, “Cloud Computing- A Practical Approach” ,TMH Pub
5. Sosinsky, “ Cloud Computing” , Wiley Pub



IT 506 INDUSTRIAL TRAINING

Duration: 2 weeks after the IV semester in the semester break, Assessment in V semester.

SCHEME OF EXAMINATION

For the assessment of industrial training undertaken by the students, following components are considered.

(a) Term work

In Industry Marks allotted

1. Attendance and General Discipline
2. Daily diary Maintenance
3. Initiative and participative attitude during training
4. Assessment of training by Industrial Supervisor

Marks of various components in industry should be awarded to the students, in consultations with the Training and Placement Officer/Faculty of Institute and I/c of training from Industry.

During training students will prepare a first draft of training report in consultation with section in-charge. After training they will prepare final draft with the help of T.P.O./Faculty of the institute. Then they will present a seminar on their training and they will face viva-voce on training in the institute.

OBJECTIVE OF INDUSTRIAL TRAINING

The objective of undertaking industrial training is to provide work experience so that student's engineering knowledge is enhanced and employment prospects are improved. The student should take this course as a window to the real World of Work and should try to learn as much as possible from real life experiences by involving and interacting with industry staff. Industrial training also provides an opportunity to students to select an engineering problem and possibly an industry guide.

Industrial training of the students is essential to bridge the wide gap between the classroom and industrial environment. This will enrich their practical learning and they will be better equipped to integrate the practical experiences with the classroom learning process.

LEARNING THROUGH INDUSTRIAL TRAINING

During industrial training students must observe following to enrich their learning:

- Industrial environment and work culture.
- Organizational structure and inter personal communication.
- Machines/ equipment/ instruments - their working and specifications.
- Product development procedures and phases.
- Project planning, monitoring and control.
- Quality control and assurance.
- Maintenance system.



- Costing system.
- Stores and purchase systems.
- Layout of Computer/ EDP/MIS centers.
- Roles and responsibilities of different categories of personnel.
- Customer services.
- Problems related to various areas of Work etc.

Faculty and TPO are supposed to plan industrial training in such a manner that students get exposure on most of the above arena in the field (world of work). Students are supposed to acquire the knowledge on above by -

1. Observation,
2. Interaction with officials at the workplace
3. Study of Literature at the workplace (e.g. User Manual, standards, maintenance schedules, etc.)
4. "Hands on" experience
5. Undertaking / assisting project work.
6. Solving problems at the work place.
7. Presenting a seminar.
8. Participating in-group meeting/ discussion.
9. Gathering primary and secondary data/ information through various sources, Storage, retrieval and analysis of the gathered data.
10. Assisting officials and managers in their working.
11. Undertaking a short action research work.
12. Consulting current technical journals and periodicals in the library.
13. Discussions with peers.

GUIDANCE TO THE FACULTY/TPO FOR PLANNING AND IMPLEMENTING THE INDUSTRIAL TRAINING

The industrial training programme which is spread to 2 weeks' duration has to be designed in consultation with the authorities of the work place, keeping in view the need of the contents. Following are some of the salient points: Spelling out the objectives of the industrial training in behavioral terms and same is informed in advance to the

- 1) students
- 2) authorities of the work place
- 3) supervising



Faculty members.

- Discussing and preparing students for the training for which meetings with the students has to be planned
- Meeting with industrial personnel and orienting them regarding the objective of the training and the expectations of the programme.
- Correspondence with the authorities of the work place.
- Orientation classes for students on how to make the training most beneficial - monitoring daily diary, writing weekly reports, how to interact with various categories of industrial personnel, how to behave and undertake responsibilities, how to gather information from the workplace, ethics etc.
- Guiding students to make individual plans (week wise/ day wise) to undertake industrial training
- Developing a system of maintaining training records, by teachers for every batch of students for convenient retrieval.
- Inviting industrial personnel to deliver lectures on some aspects of training.

ACTION PLAN FOR PLANNING STAGES AT THE INSTITUTION LEVEL

- 1.Meeting with Principal
- 2.Meeting with Colleagues
- 3.Correspondence with work place (Industries concerned)
- 4.Meeting with authorities of work place
- 5.Orientation of students for industrial training
- 6.Scrutinizing individual training plan of students
- 7.Commencement of industrial training
- 8.First monitoring of industrial training
- 9.Second monitoring of industrial training
10. Finalization of Training report
11. Evaluation of performance at Industry level
12. Evaluation of industrial programme in the institution



IT 507 VALUE EDUCATION

UNIT-I

Value Education - Definition - relevance to present day - Concept of Human Values - self introspection - Self esteem.

UNIT-II

Family values - Components, structure and responsibilities of family - Neutralization of anger - Adjustability - Threats of family life - Status of women in family and society - Caring for needy and elderly - Time allotment for sharing ideas and concerns.

UNIT-III

Ethical values - Professional ethics - Mass media ethics - Advertising ethics - Influence of ethics on family life - psychology of children and youth - Leadership qualities - Personality development.

UNIT-IV

Social values - Faith, service and secularism - Social sense and commitment - Students and Politics - Social awareness, Consumer awareness, Consumer rights and responsibilities - Redressal mechanisms.

UNIT-V

Effect of international affairs on values of life/ Issue of Globalization - Modern warfare - Terrorism. Environmental issues - mutual respect of different cultures, religions and their beliefs.

Reference Books

1. T. Anchukandam and J. Kuttainimathathil (Ed) Grow Free Live Free, Krisitu Jyoti Publications, Bangalore (1995)
2. Mani Jacob (Ed) Resource Book for Value Education, Institute for Value Education, New Delhi 2002.
3. DBNI, NCERT, SCERT, Dharma Bharti National Institute of Peace and Value Education, Secunderabad, 2002.
4. Daniel and Selvamony - Value Education Today, (Madras Christian College, Tambaram and ALACHE, New Delhi, 1990)
5. S. Ignacimuthu - Values for Life - Better Yourself Books, Mumbai, 1991.
6. M.M.M. Mascaronhas Centre for Research Education Science and Training for Family Life Promotion - Family Life Education, Bangalore, 1993.

WEBSITES AND e-LEARNING SOURCES:

www.rkmissiondhe.org/education.html

[/www.clallam.org/lifestyle/education.htm](http://www.clallam.org/lifestyle/education.htm)

www.sun.com/./edu/progrmws/star.ht

www.infoscouts.com

www.secretofsuccess.com

www.1millionpapers.com

<http://militaryfinance.umuc.edu/education/edu-network.html/>



IT 508 UML

Unit - 1

Introduction to UML, Importance of modeling, Principles of modeling, Overview of UML
Conceptual model of the UML, Architecture, Software development life cycle

Unit – 2

Structural Modeling, Classes, Relationships, Common mechanisms, Diagrams, Class diagrams
Advanced classes, Advanced relationships ,Object diagrams ,Common modeling techniques
(Refer the above topics)

Unit - 3

Behavioral Modeling, Interactions, Interaction diagrams ,Use cases, Use case diagrams Activity
diagrams, Events and signals, State machines, State chart diagrams

Unit - 4

Architectural Modeling, Architectural Modeling: Components, Deployment, Component
diagrams, Deployment diagrams, Common modeling techniques

Unit - 5

Introduction: What is a design pattern?, Design patterns in Smalltalk MVC, Describing design
patterns, The catalog of design patterns, Organizing the catalog, How design patterns solve
design problems, How to select a design pattern, How to use a design pattern

Unit - 6

Creational Patterns, Abstract Factory, Builder, Factory Method, Prototype, Singleton

Unit - 7

Structural Patterns, Adapter, Bridge, Composite, Decorator, Façade, Flyweight, Proxy

Unit - 8

Behavioral Patterns, Chain of Responsibility, Command, Interpreter, Iterator, Mediator,
Memento, Observer, Strategy, Template Method, What to expect from design patterns?

Reference books:

1. Designing Flexible Object Oriented systems with UML - Charles Ritcher
2. Object oriented Modeling and Design with UML - James Rumbaugh. Micheal Blaha (second edition)
3. The Unified Modeling Language User Guide - Grady Booch, James Rumbaugh, Ivar Jacobson.



IT 601 NETWORK MANAGEMENT

Unit-I

Introduction to Network Managements, Network Management Framework, Network Based Managements, Evolution of Network Management: SGMP, CMIP, SNMP. Network Implementation and Management Strategies, Network Management Categories: Performance Management, Fault Management, Configuration Management, Security Managements, Accounting Managements. Network Management Configuration: Centralized Configuration, Distributed Configuration. Selected Management Strategy.

Unit –II

Management Information Base (MIB), Structure of Management Information, NMS Presentation of the SMI, NMS Meter-ware Network View. Remote Monitoring (RMON), RMON Group. Desktop Management: Desktop Management Interface(DMI), DMI Architecture, DMI Browser, DMI/SNMP Mapping, Desktop SNMP Extension Agents. Setting up LAN Access, SNMP Configuration.

Unit-III

Introduction, layering, OSI Layering, TCP/IP Layering, Protocols & Standards, Internet standards, Internet administration, Internet Addresses, Internet protocol: introduction, IP header, IP routing, subnet addressing, subnet mask, special case of IP addresses, Comparative Study of IPV4 & IPV6, port numbers Address Resolution Protocol, ARP packet format, Proxy ARP, ARP command, ARP Example, Reverse Address Resolution Protocol (RARP): Introduction, RARP Packet format, RARP Examples, RARP server design

Unit-IV

Delivery and Routing of IP Packets, Routing Methods, Static versus Dynamic Routing, Routing table and Routing Module, Classless Addressing: CIDR. Internet Protocol (IP), Datagram, Fragmentation, Options, IP Package. Interior and Exterior Routing, Routing information protocol (RIP), Open shortest path first protocol (OSPF), BGP, GGP. Private Networks. Virtual Private Network (VPN), Network Address Translation (NAT).

Unit –V

Internet Control Message Protocols (ICMP):- Types of message, message format, error reporting, query, checksum, ICMP Package. IGMP, IGMP Message and its Operation, IGMP Package. Transmission control protocol, Process-to- Process Communication, TCP Services Flow Control, TCP Timers. TCP Operation, TCP Package.. Application layers protocol, Telnet Protocol, File Transfer Protocol (FTP), Simple Mail Transfer Protocol (SMTP), X-Window system protocol, Remote procedure call, and Network file system.

References:

1. Forouzan, TCP/IP Protocol Suite 4th edition, TMH
2. J.Richard Burkey, Network Management Concept and Practice, PHI
3. Stevens, TCP/IP Illustrated Volume-I, Pearson
4. Tittel: TCP/IP, Cenage Learning
5. Uyles Black, TCP/IP and related protocols, McGraw Hill.
6. Doughals E. Comer, Internetworking with TCP/IP Vol. I, Principles, Protocols, and Architecture, Prentice Hall, India.
- 7.



IT 602 AUTOMATA AND COMPILER DESIGN

Unit I:

Introduction: Alphabets, Strings and Languages; Automata and Grammars, Deterministic finite Automata (DFA)-Formal Definition, Simplified notation: State transition graph, Transition table, Language of DFA, Nondeterministic finite Automata (NFA), Equivalence of NFA and DFA, Minimization of Finite Automata, Regular Expressions, Arden's theorem.

Unit II:

Compiler Structure: Compilers and Translators, Various Phases of Compiler, Pass Structure of Compiler, Bootstrapping of Compiler. Lexical Analysis: The role of Lexical Analyzer, A simple approach to the design of Lexical Analyzer, Implementation of Lexical Analyzer. The Syntactic Specification of Programming Languages: CFG, Derivation and Parse tree, Ambiguity, Capabilities of CFG. Basic Parsing Techniques: Top-Down parsers with backtracking, Recursive Descent Parsers, Predictive Parsers.

Unit III:

Bottom-up Parsers, Shift-Reduce Parsing, Operator Precedence Parsers, LR parsers (SLR, Canonical LR, LALR) Syntax Analyzer Generator: YACC, Intermediate Code Generation: Different Intermediate forms: three address code, Quadruples & Triples. Syntax Directed translation mechanism and attributed definition. Translation of Declaration, Assignment, Control flow, Boolean expression, Array References in arithmetic expressions, procedure calls, case statements, postfix translation.

Unit IV:

Run Time Memory Management: Static and Dynamic storage allocation, stack based memory allocation schemes, Symbol Table management Error Detection and Recovery: Lexical phase errors, Syntactic phase errors, Semantic errors.

Unit V:

Code Optimization and Code Generation: Local optimization, Loop optimization, Peephole optimization, Basic blocks and flow graphs, DAG, Data flow analyzer, Machine Model, Order of evaluation, Register allocation and code selection

References:-

1. Louden, "Compiler construction", Cengage learning .
2. Alfred V Aho, Jeffrey D. Ullman, "Principles of Compiler Design", Narosa.
3. A.V. Aho, R. Sethi and J.D Ullman, "Compiler: principle, Techniques and Tools", AW.
4. Michal Sipser, "Theory of Computation", Cengage learning.
5. H.C. Holub, "Compiler Design in C", Prentice Hall Inc.
6. Hopcroft, Ullman, "Introduction to Automata Theory, Languages and Computation", Pearson Education.
7. Education.
8. K.L.P. Mishra and N.Chandrasekaran, "Theory of Computer Science : Automata, Languages and Computation",PHI.
9. Computation",PHI.



IT- 603 – SOFTWARE ENGINEERING & PROJECT MANAGEMENT

Unit I

Introduction, Software - problem and prospects Software development process: Software life cycle models, Open source software development, the unified process, documentation, configuration management, Safety, risk assessment.

Unit II

Measures, Metrics and Indicators, Metrics in the Process and Project Domains, Software Measurement, Metrics of Software Quality, S/W reliability, Software estimation techniques, loc and FP estimation. Empirical models like COCOMO, project tracking and scheduling, reverse engineering.

Unit III

Software requirements and specification: feasibility study, Informal/ formal specifications, pre/post conditions, algebraic specification and requirement analysis models, Specification design tools. Software design and implementation: Software design objectives, design techniques, User interface design, modularity Functional decomposition Data flow design, Data structure design, Object-oriented design, Design patterns implementation strategies like top-down, bottom-up, team etc.

Unit IV

Coding standard and guidelines, programming style, code sharing, code review, software components, rapid prototyping, specialization, construction, class extensions, intelligent software agents, reuse performance improvement, debugging. Software Testing Strategies: Verification and Validation, Strategic Issues, test plan, white box, black-box testing, unit and integration testing, system testing test case design and acceptance testing, maintenance activities.

Unit V

Organizing: Alternatives for project managers, matrix organization, Staffing, Directing: leadership, delegation, motivation, Controlling risk analysis and RMMM plan, project scheduling and tracking plan, SQA and quality planning, SCM activities and plan, project management plan. Re-engineering, reverse, forward engineering, web engineering, Software project management standards

References:

1. Software Engineering. A Practitioner's Approach by P.S. Pressman New edition McGraw.
2. Software project Management from concept to development Black Book by Kieron Conway, Dreamtech Press.
3. Software Engineering principle and practices- Deepak Jain Oxford University Press.
4. Software Engineering for students 4/e - Bell Douglas Pearson Education
5. Software Project Management, Kelkar, PHI Learning



IT- 604 – COMPUTER GRAPHICS AND MULTIMEDIA

Unit I

Introduction to Raster scan displays, Storage tube displays, refreshing, flickring, interlacing, colour monitors, display processors resolution, working principle of dot matrix, inkjet laser printers, working principles of keyboard, mouse scanner, digitizing camera, track ball, tablets and joysticks, graphical input techniques, positioning techniques, rubber band techniques, dragging etc.

Unit II

Scan conversion techniques, image representation, line drawing, simple DDA, Bresenham's Algorithm, Circle drawing, general method, symmetric DDA, Bresenham's Algorithm, curves, parametric function, Bezier Method, B-spline Method.

Unit III

2D & 3D Co-ordinate system, Translation, Rotation, Scaling, Reflection Inverse transformation, Composite transformation, world coordinate system, screen coordinate system, parallel and perspective projection, Representation of 3D object on 2D screen. Point Clipping. Line Clipping Algorithms, Polygon Clipping algorithms, Introduction to Hidden Surface elimination, Basic illumination model, diffuse reflection, specular reflection, phong shading, Gourand shading ray tracing, color models like RGB, YIQ, CMY, HSV etc.

Unit IV

An Introduction – Multimedia applications – Multimedia System Architecture – Evolving technologies for Multimedia – Defining objects for Multimedia systems – Multimedia Datainterface standards – Multimedia Databases.

Multimedia components, Multimedia Hardware, SCSI, IDE, MCI, Multimedia -Tools, presentation tools, Authoring tools .

Unit V

Compression & Decompression – Multimedia Data & File Format standards : -TIFF, MIDI, JPEG, DIB, MPEG,RTF, – Multimedia I/O technologies - Digital voice and audio – Video image and animation–Full motion video – Storage and retrieval technologies.

References:-

1. Donald Hearn and M.Pauline Baker, "Computer Graphics C Version", Pearson Education, 2003.
2. Prabat K Andleigh and Kiran Thakrar, "Multimedia Systems and Design", PHI Learning, 3rd Indian reprint edition, 2008.
3. Tay Vaughan, "Multimedia making it work", Tata McGraw Hill edition.
4. Amarendra N Sinha & Arun D Udai, "Computer Graphics", McGraw Hill publication . Fundamental of Computer Graphics and Multimedia, Mukherjee, PHI Learning



Suggested list of experiment

1. Write a program to implement DDA line drawing algorithm
2. Write a program to implement Bresenham's line drawing algorithm.
3. Write a program to implement Bresenham's circle drawing algorithm
4. Write a program to draw an ellipse using Bresenham's algorithm.
5. Write a program to perform various transformations on line, square & rectangle.
6. Write a program to implement Cohen Sutherland line clipping algorithm.
7. Write a program to implement Liang-Bersky line clipping algorithm.
8. Write a program to implement Cohen-Sutherland polygon clipping algorithm to clip a polygon with a Pattern.
9. Write a program to convert a color given in RGB space to its equivalent CMY color space.
10. Study of various Multimedia file formats:-RTF,MIDI,GIF,JPEG,MPEG,TIFF etc.
11. Write a program to implement JPEG compression scheme for still images.
12. Write a program to perform Packbits compression & decompression.
13. Write a short program to create a TIFF file using bitmap segments and text files as the TIFF File components.
14. Write a program to convert a BMP file into either JPEG or GIF file.
15. Study of various Multimedia Authoring Tools.



IT 605 UNIX & SHELL PROGRAMMING

UNIT-I

General Overview of the System: System structure, user perspective, O/S services assumption about Hardware The Kernel and buffer cache architecture of Unix O/S, System concepts, Kernel data Structure, System administration, Buffer headers, Structure of the buffer pool, Scenarios for retrieval of the buffer, Reading and writing disk block, Advantage and disadvantage of buffer cache.

UNIT-II

Internal Representation of Files: Inodes, Structure of regular, Directories conversions of a path name to an inode, Super block, Inode assignment to a new file, Allocation of disk blocks, Open read write file and record close, File creation, Operation of special files change directory and change root, change owner and change mode. STAT and FSTAT, PIPES mounting and unmounting files system, Link Unlink

UNIT-III

Structures of Processes and process control: Process states and transitions layout of system memory, the context of a process, manipulation of process address space, Sleep process creation/termination. The user Id of a process, changing the size of a process. Killing process with signals, job control, scheduling commands: AT and BATCH, TIME, CORN.

UNIT-IV

Introduction to shell scripts: shell Bourne shell, C shell, Unix commands, permissions, editors, grep family, shell variables, scripts, metacharacters and environment, if and case statements, for while and until loops. Shell programming.

UNIT-V

Introduction of Awk and perl Programming: Awk pattern scanning , BEGIN and END patterns, Awk arithmetic and variables, and operators, functions, perl; the chop() function, variable and operators. Networking tools: Resolving IP addressing, TELNET, FTP, Socket programming, introduction of Linux structure .

References:-

1. M.J. Bach “Design of UNIX O.S. “, PHI Learning
2. Y.Kanetkar “Unix shell programming”, BPB Pub.
3. B.W. Kernighan & R. Pike, “The UNIX Programming Environment”, PHI Learning
4. S.Prata “Advanced UNIX: A Programming@s Guide”, BPB Publications, New Delhi.
5. Beck “Linux Kernel, Pearson Education, Asia.
6. Sumitabha Das “ Unix concepts and Applications”.Tata McGraw Hill,Second Edition,2001



IT 606 ENGINEERING PROJECT(MINOR)

Project Work

Objectives: To expose students with project-product development cycle using industrial experience, use of state-of -art technologies. Exposure to Learning and knowledge access techniques and participation in research activities.

Project Term Work

The project group will submit the project including title of the project, Technical Key Words and supporting the project idea, Plan of project execution. A Report consisting of problem definition, literature survey, platform choice, SRS (System Requirement Specification) Document in specific format and high-level design document along with.



IT 607 MATLAB

I) Introduction to Matlab

1. Matlab as {best} calculator
2. Standard Matlab windows
3. Operations with variables
 - a) Naming b) Checking existence c) Clearing d) Operations
4. Arrays
 - a) Columns and rows: creation and indexing b) Size & length c) Multiplication, division, power d) Operations
5. Writing script files
 - a) Logical variables and operators b) Flow control c) Loop operators
6. Writing functions
 - a) Input/output arguments b) Function visibility, path. c) Example: Matlab startup
7. Simple graphics
 - a) 2D plots b) Figures and subplots

II) Data and data flow in Matlab. 1. Data types

- a) Matrix, string, cell and structure b) Creating, accessing elements and manipulating of data of different types
2. File Input-Output
- a) Matlab files b) Text files c) Binary files d) Mixed text-binary files
3. Communication with external devices
- a) Serial port b) Parallel port c) Sound card d) Video input

III) Function minimization and parameters search. 1. Polynomial fit

- a) 1D and 2D fits b) Data windowing c) Error bounds
2. Arbitrary function fit
- a) Error function b) Fixing parameters
3. Goodness of fit
- a) 2 criteria b) Error in parameters

IV) Handle graphics and user interface.

1. Pre-defined dialogs
2. Handle graphics
 - a) Graphics objects b) Properties of objects c) Modifying properties of graphics objects
3. Menu-driven programs
 - a) Controls: uimenu and uicontrol b) Interactive graphics c) Large program logic flow



IT 608 ETHICS AND VALUES

UNIT - I: Introduction

- Nature & scope of human values & Ethics
- Moral Character building
 - A) Eastern perspective : M.K. Gandhi & Vivekananda
 - B) Western perspective : Aristotle and Immanuel Kant
- Uses of the study in social & professional life

UNIT - II: Ethical concepts

- Virtue & Vice
- Right & Wrong
- Justice & Fairness

UNIT - III: Indian Value system

- Dharma (Righteous way of living) its meaning & classification
- Yama : its Five ethical disciplines : i) Satya (Truth) ii) Ahimsa (Non - Violence) iii) Asthaya (Non stealing) iv) Aparigraha (Non- possession) v) Brahmacharya (celibacy)
- Niyama its five rules of self discipline - i) soucha (Physical & mental cleanliness) ii) santosha (happiness) iii) Tapas (Controlling senses & mind) iv) Swadhyaya (studying scriptures with self introspection) v) iswarapranidana (surrender worship of God)

UNIT - IV: Great personalities

- Socrates - Sacrificing one's life for the sake of truth
- Buddha : Astanaga marga for rightful way of life
- Mother Theresa - Service to Humanity

UNIT - V: Practical Ethics

- Social Ethics : The justification of civil disobedience in a democratic state.
- Business Ethics : The Moral & Social responsibility of Business organizations
- Medical Ethics Code of pharmaceutical ethics, and physician - patient relationship

Reference Books:

- McKenzie - (1975) A Manual of ethics new delhi, oxford.
- William Lillie (2007) An introduction to ethics, Delhi, Surjeet.
- Y.V. Satyanarayana, (2013), "medical ethics principle & problem" Germany; lambert publications.
- Jadunath Sinha, (1990) A manual of ethics Calcutta new central book agency.
- Subramanian R. (2013) Professional ethics, New Delhi: Oxford.



IT- 7011 - IMAGE PROCESSING

Unit I:

Image representation, fundamental steps in image processing, image model. Sampling & quantization. Neighbors of a pixel, connectivity and distance measures. Basic transformations and perspective transformations. Two dimensional Fourier transform, Discrete Fourier transform and their properties. Fast Fourier transform, Walsh Transform, Hadamard transform and Discrete Cosine transform.

Unit II:

Image Enhancement: Intensity transformations, histogram processing, Image subtraction, image averaging, Spatial filtering-smoothing and sharpening filters, frequency domain filtering methods-low pass filtering, high pass filtering, median filtering.

Unit III:

Image compression: Redundancy and its types. Image compression model, variable length coding, bit plane coding, constant area coding, run length coding, lossless and lossy predictive coding, transform coding.

Unit IV:

Image restoration and Segmentation: Degradation model, effect of diagonalisation on degradation, algebraic approach. Detection of discontinuities by point, line and edge detection. Edge linking, graph theoretic techniques, thresholding techniques, region oriented segmentation.

Unit V:

Representation & Description: Chain codes, polygonal approximations, signatures, boundary segments, skeleton, boundary descriptors, shape descriptors regional descriptors, image morphology-dilation, erosion, opening, closing, thickening, thinning, skeleton, pruning, hit or miss transform.

References:-

1. R.C Gonzalez & Richard E Wood, "Digital Image Processing" ,Addison Wesley Publishing
2. Anil K Jain, "Fundamentals of Digital image processing". PHI.
3. Sonka, Hlavac, Boyle, "Digital image processing and computer vision", cengage learning, India Edition.
4. B Chanda, D. Dutta Majumder, "Digital image Processing and Analysis", PHI.



IT 7012 - ARTIFICIAL INTELLIGENCE

Unit I:

Meaning and definition of artificial intelligence, Various types of production systems, Characteristics of production systems, Study and comparison of breadth first search and depth first search. Techniques, other Search Techniques like hill Climbing, Best first Search. A* algorithm, AO* algorithms etc, and various types of control strategies.

Unit II:

Knowledge Representation, Problems in representing knowledge, knowledge representation using propositional and predicate logic, comparison of propositional and predicate logic, Resolution, refutation, deduction, theorem proving, inferencing, monotonic and non- monotonic reasoning.

Unit III:

Probabilistic reasoning, Baye's theorem, semantic networks, scripts, schemas, frames, conceptual dependency, fuzzy logic, forward and backward reasoning.

Unit IV:

Game playing techniques like minimax procedure, alpha-beta cut-offs etc, planning, Study of the block world problem in robotics, Introduction to understanding and natural languages processing.

Unit V:

Introduction to learning, Various techniques used in learning, introduction to neural networks, applications of neural networks, common sense, reasoning, some example of expert systems.

References:-

1. Rich E and Knight K, "Artificial Intelligence", TMH, New Delhi.
2. Nelsson N.J., "Principles of Artificial Intelligence", Springer Verlag, Berlin.



IT 7013 - E-COMMERCE AND MANAGEMENT

Unit I:

Introduction to e-commerce: History of e-commerce, e-business models B2B, B2C, C2C, C2B, legal; environment of e-commerce, ethical issues, electronic data interchange, value chain and supply chain, advantages and disadvantages of e-commerce.

Unit II:

Electronic Payment Systems: Credit cards, debit cards, smart cards, e-credit accounts, e-money, Marketing on the web, marketing strategies, advertising on the web, customer service and support, introduction to m-commerce, case study: e-commerce in passenger air transport.

Unit III:

E-Government, theoretical background of e-governance, issues in e-governance applications, evolution of e-governance, its scope and content, benefits and reasons for the introduction of e-governance, e-governance models- broadcasting, critical flow, comparative analysis, mobilization and lobbying, interactive services / G2C2G.

Unit IV:

E-readiness, e-government readiness, E-Framework, step & issues, application of data warehousing and data mining in e-government, Case studies: NICNET-role of nation wide networking in e-governance, e-seva.

Unit V:

E-Government systems security: Challenges and approach to e-government security, security concern in e-commerce, security for server computers, communication channel security, security for client computers.

References:-

1. Gary P. Schneider, "E-commerce", Cengage Learning India.
2. C.S.R. Prabhu, "E-governance: concept and case study", PHI Learning Private Limited.
3. V. Rajaraman, "Essentials of E-Commerce Technology", PHI Learning Private Limited.
4. David Whiteley, "E-commerce study, technology and applications", TMH.
5. J. Satyanarayan, "E-government: The science of the possible", PHI Learning Private Limited.
6. P.T. Joseph, "E-Commerce An Indian Perspective", PHI Learning Private Limited.
7. Hanson and Kalyanam, "E-Commerce and Web Marketing", Cengage Learning India.



IT- 702 – INFORMATION SECURITY

Unit I:

Basic of Cryptography, secret key cryptography, Types of attack, Substitution ciphers, Transposition ciphers, block ciphers and stream ciphers, Confusion and Diffusion, Data encryption standard, round function, modes of operation, cryptanalysis, brute force attack, Security Goals (Confidentiality, Integrity, Availability).

Unit II:

Public key Cryptography, Modulo arithmetic, Greatest common divisor, Euclidean algorithm, RSA algorithm, hash function, attack on collision resistance, Diffie hellman key exchange, Digital signature standard, elliptic curve cryptography.

Unit III:

Authentication: One way Authentication, password based, certificate based, Mutual Authentication, shared secret based, Asymmetric based, Authentication and key agreement, centralized Authentication, eavesdropping, Kerberos, IP security overview:- security association & Encapsulating security payload, tunnel and transfer modes, internet key exchange protocol, Secure Socket Layer(SSL), Transport Layer Security (TLS).

Unit IV:

Software vulnerabilities: Phishing Attacks, buffer overflow vulnerability, Format String attack, Cross Site Scripting, SQL injection Attacks, Email security:- Security services of E-mail, Establishing keys, Privacy, Authentication of the source, Message integrity, Non-Repudiation, Viruses, Worms, Malware.

Unit V:

Web Issue: Introduction, Uniform Resource Locator/uniform resource identify, HTTP, Cookies, Web security problem, Penetration Testing, Firewalls:- functionality, Policies and Access Control, Packet filters, Application level gateway, Encrypted tunnel, Security architecture, Introduction to intrusion detection system.

References:-

1. Bernard Menezes, “ Network Security and Cryptography”, CENGAGE Learning. Charlie Kaufman, “ Network Security”, PHI.
2. Forouzan, “Cryptography & Network Security”, TMH
3. Randy Weaver, “ Network Infrastructure Security”, Cengage Learning. Atul Kahate, “ Cryptography and Network Security”, TMH.
4. William Stallings, “ Cryptography and Network security”, Pearson.



IT- 703 – WEB TECHNOLOGY

UNIT I

History of the internet, internetworking concepts, architecture, and protocol: switch, router, protocols for internetworking, internet address and domains. Introduction World Wide Web (WWW), working of web browser and web server, Web server and its deployment, N-tier architecture, services of web server, Common gateway interface (CGI), Uniform Resource Locator (URL), format of the URL, Hyper Text Transfer Protocol (HTTP), feature of HTTP protocol HTTP request-response model, Hyper Text Transfer Protocol Secure (HTTPS).

UNIT II

Introduction to Hyper Text Markup Language (HTML), HTML elements, XHTML syntax and Semantics, eXtensible Markup Language (XML), element, attributes, entity declarations. DTD files and basics of Cascading Style Sheet (CSS). Document object Model (DOM) history and levels, Document tree, DOM event handling.

UNIT III

Introduction to Java Script, Basic concepts, variables and data types, functions, conditional statements, Loops, Operators, Arrays, Standard Objects and form processing in Java

UNIT IV

Evaluation of web applications, type of web documents, feature of web pages, multitier web applications, introduction to Apache web server. Security in application: authentication, authorization, auditing, security issues, security on the web, proxy server, Firewall. Middleware Concepts, CORBA, Java Remote Method Invocation (RMI) , Message Oriented Middleware(MOM), EJB, Microsoft's Distributed Component Object Model(DCOM) Web Servers HTTP request types System Architecture Server side Scripting. Web server and its deployment, Web client, services of web server, mail server proxy server, multimedia server.

UNIT V

Introduction to servlet, Overview Architecture Handling HTTP Request, Get and post request, redirecting request multi-tier applications. Introduction to JSP, basic JSP, Java Bean class and JSP. Setting up an Open Data Base Connectivity (ODBC) data source.

References:-

1. Web Technologies- A computer science perspective By Jeffrey C. Jackson, Pearson Education .
2. Web Technologies-TCP/IP Architecture, and Java Programming By Achyut S. Godbole and Atul Kahate
3. An introduction to Web Design+Programming by Paul S. Wang Sanda, S Katila,CENGAGE Learning.
4. Web Technology- A developer's Perspective by N.P.Gopalan, J.Akilandeswari , PHI Learning



IT 704 - DATA MINING & WAREHOUSING

Unit I:

Data Warehousing: Need for data warehousing , Basic elements of data warehousing, Data Mart, Data Warehouse Architecture, extract and load Process, Clean and Transform data, Star ,Snowflake and Galaxy Schemas for Multidimensional databases, Fact and dimension data, Partitioning Strategy-Horizontal and Vertical Partitioning.

Unit II:

Data Warehouse and OLAP technology, Multidimensional data models and different OLAP Operations,OLAP Server: ROLAP, MOLAP, Data Warehouse implementation ,Efficient Computation of Data Cubes, Processing of OLAP queries, Indexing data.

Unit III:

Data Mining: Data Preprocessing ,Data Integration and Transformation, Data Reduction, Discretizaion and Concept Hierarchy Generation , Basics of data mining, Data mining techniques, KDP (Knowledge Discovery Process), Application and Challenges of Data Mining, Introduction of Web Structure Mining, Web Usage Mining, Spatial Mining, Text Mining, Security Issue, Privacy Issue, Ethical Issue.

Unit IV:

Mining Association Rules in Large Databases: Association Rule Mining, Single-Dimensional Boolean Association Rules, Multi-Level Association Rule, Apriori Algorithm, Fp-Growth Algorithm, Time series mining association rules, latest trends in association rules mining.

Unit V:

Classification and Clustering Distance Measures, Types of Clustering, K-Means Algorithm, Decision Tree Induction, Bayesian Classification, Association Rule Based, Other Classification Methods, Prediction, Classifier Accuracy, Categorization of methods, Partitioning methods, Outlier Analysis.

Reference:-

1. P.Ponnian, “Data Warehousing Fundamentals”, John Weliey.
2. Han,Kamber, “Data Mining Concepts & Techniques”, M.Kaufman.
3. M.H.Dunham, “Data Mining Introductory & Advanced Topics”, Pearson Education.
4. Ralph Kimball, “The Data Warehouse Lifecycle Tool Kit”, John Wiley.
5. M.Berry , G.Linoff, “Master in Data Mining”, John Wiley.
6. W.H.Inmon, “Building the Data Ware houses”, Wiely Dreamtech.
7. E.G. Mallach , “The Decision Support & Data Warehouse Systems”, TMH



IT- 705 – SOFT COMPUTING

Unit I:

Introduction to Neural Network: Concept, biological neural network, evolution of artificial neural network, McCulloch-Pitts neuron models, Learning (Supervise & Unsupervise) and activation function, Models of ANN- Feed forward network and feedback network, Learning Rules- Hebbian, Delta, Perceptron Learning and Windrow-Hoff, winner take all.

Unit II:

Supervised Learning: Perceptron learning,- Single layer/multilayer, linear Separability, Adaline, Madaline, Back propagation network, RBFN. Application of Neural network in forecasting, data compression and image compression.

Unit III:

Unsupervised learning: Kohonen SOM (Theory, Architecture, Flow Chart, Training Algorithm) Counter Propagation (Theory , Full Counter Propagation NET and Forward only counter propagation net), ART (Theory, ART1, ART2). Application of Neural networks in pattern and face recognition, intrusion detection, robotic vision.

Unit IV:

Fuzzy Set: Basic Definition and Terminology, Set-theoretic Operations, Member Function, Formulation and Parameterization, Fuzzy rules and fuzzy Reasoning, Extension Principal and Fuzzy Relations, Fuzzy if-then Rules, Fuzzy Inference Systems. Hybrid system including neuro fuzzy hybrid, neuro genetic hybrid and fuzzy genetic hybrid, fuzzy logic controlled GA. Application of Fuzzy logic in solving engineering problems.

Unit V:

Genetic Algorithm: Introduction to GA, Simple Genetic Algorithm, terminology and operators of GA (individual, gene, fitness, population, data structure, encoding, selection, crossover, mutation, convergence criteria). Reasons for working of GA and Schema theorem, GA optimization problems including JSPP (Job shop scheduling problem), TSP (Travelling salesman problem), Network design routing, timetabling problem. GA implementation using MATLAB.

References:-

1. S.N. Shivnandam, “Principle of soft computing”, Wiley.
2. T. Rajshekar and G.A.V. Pai, “Neural Network , Fuzzy logic And Genetic Algorithm”, PHI.
3. Jack M. Zurada, “Introduction to Artificial Neural Network System” JAico Publication. Simon Haykins, “Neural Network- A Comprehensive Foudation”
4. Timothy J.Ross, “Fuzzy logic with Engineering Applications”, McGraw-Hills 1.



List of Experiment:-

1. Form a perceptron net for basic logic gates with binary input and output.
2. Using Adaline net, generate XOR function with bipolar inputs and targets.
3. Calculation of new weights for a Back propagation network, given the values of input pattern, output pattern, target output, learning rate and activation function.
4. Construction of Radial Basis Function Network.
5. Use of Hebb rule to store vector in auto associative neural net.
6. Use of ART algorithm to cluster vectors.
7. Design fuzzy inference system for a given problem.
8. Maximize the function $y = 3x^2 + 2$ for some given values of x using Genetic algorithm.
9. Implement Travelling salesman problem using Genetic Algorithm.
10. Optimization of problem like Job shop scheduling using Genetic algorithm.



IT 706 MOBILE APPLICATION DEVELOPMENT

UNIT I

Mobile Application Development Overview, Platform Development Environment, Characteristics of mobile applications, Different tools for mobile app development, Benefits of mobile application development, Languages for mobile application development, Mobile application architecture, Introduction to C#.

UNIT II

Introduction to two of the bigger names platforms: Android, Windows Phone, Factors in Developing Mobile Applications, Code Sharing Techniques, Accessing the Network, Storing Data by using C#, Location and Mapping Capabilities Of both Platforms Using C#, Introduction to XAML

UNIT III

Data, Binding, and Pages, Adding an AppBar, Creating Flyouts, Navigating Within a Windows App, Changes in Code, Supporting Views, Responding to View , Breaking Out of the Snapped View, Using Tiles and Badges, Improving Static Tiles, Updating Wide Tiles , Creating Live Tiles, Applying Badges

UNIT IV

Mobile Application Development: Mobile User Interface Design, Understanding mobile application User, Mobile Website, Getting started with Android, Development, Creating an android virtual device, Getting started with windows 7, Metro, Application Bar, Tombstoning, Silverlight vs. Windows Phone 7 Phone gap, Logitech Squeezebox, Controller MonoTouch and Mono for Android, Why MonoTouch/Mono for Android?

UNIT V

Windows Store App Development: Setting Up the development environment, Configuring the project, The modern UI, Design inspiration, Governing Principles, Windows Store app system architecture, Deployment and the Windows Store, Multipass layout— measuring and arranging, UIElement layout properties, Panels, Brushes, graphics, styles, and resources, Displaying beautiful text, The app bar, App settings and suspend/resume, Deploying and selling your App.

Reference Books:

1. PROFESSIONAL MOBILE APPLICATION DEVELOPMENT (Jeff McWherter, Scott Gowell) Willey Publications
2. Mobile Development with C# (Gregg Shackles) O'REILLY
3. Windows8 App Revealed Using XAML and C# (Adam Freeman) Apress Publications
4. Windows Store APP Development (Pete Brown) MANNING SHELTER ISLAND
5. Professional Windows8 Programming (Nick Lecrenski, Doug Holland, Kevin Ashley) Willey publications



IT 707 NETWORK SIMULATOR

NS - 2 is a very popular discrete event Network simulator which is used in the research field of wired, Wireless and satellite networks across both academia and industry as a way of designing testing and evaluating new and existing protocols and architectures, and has also proven a very useful tool for teaching purpose.

NS - 2 Comes fully equipped of protocols, models, algorithms and accessory tools. NS - 2 is an open source network simulator which is freely available for academic research purpose. Therefore, in terms of scientific acceptance, number of tools / modules and cost, NS - 2 would be a sort of ideal choice.

Note : Network simulation required a basic understanding of programming.

Full Syllabus :

Introduction on network simulation.

Introduction to network simulator (NS2/NS3)

Components and Tools of NS.

Front and back end analysis.

TCL/OTCL programming.

NS installation in Linux / window.

Creating a wired scenario and enhancing the NAM output.

Generation of node - movement and traffic - connection for wireless scenarios.

Wired - Wireless scenario.

Wireless sensor network.

Mobile Ad - hoc network.

Graph generation using AWK Script & Trace file analysis.

Project Allocation.



IT 708 ENTERPRISE RESOURCE PLANNING

UNIT I

ERP AND TECHNOLOGY: Introduction – Related Technologies – Business Intelligence – E-Commerce and EBusiness– Business Process Reengineering – Data Warehousing – Data Mining – OLAP – Product life Cycle management – SCM – CRM

UNIT II

ERP IMPLEMENTATION : Implementation Challenges – Strategies – Life Cycle – Pre-implementation Tasks – Requirements Definition – Methodologies – Package selection – Project Teams – Process Definitions – Vendors and Consultants – Data Migration – Project management – Post Implementation Activities.

UNIT III

ERP IN ACTION & BUSINESS MODULES: Operation and Maintenance – Performance – Maximizing the ERP System – Business Modules – Finance – Manufacturing – Human Resources – Plant maintenance – Materials Management – Quality management – Marketing – Sales, Distribution and service.

UNIT IV

ERP MARKET :Marketplace – Dynamics – SAP AG – Oracle – PeopleSoft – JD Edwards – QAD Inc –SSA Global – Lawson Software – Epicor – Intuitive.

UNIT V

Enterprise Application Integration – ERP and E-Business – ERP II – Total quality management – Future Directions – Trends in ERP.

REFERENCES

1. Alexis Leon, “ERP DEMYSTIFIED”, Tata McGraw Hill, Second Edition, 2008
2. Mary Sumner, “Enterprise Resource Planning”, Pearson Education, 2007.
3. Jim Mazzullo,”SAP R/3 for Everyone”, Pearson,2007.
4. Jose Antonio Fernandz, “ The SAP R /3 Handbook”, Tata McGraw Hill, 1998.
5. Biao Fu, “SAP BW: A Step-by-Step Guide”, First Edition, Pearson Education, 2000

UNIT III



IT 801 ENGINEERING PROJECT (MAJOR)

PURPOSE

To simulate real life situations related to the program and impart adequate training so that confidence to face and tackle any problem in the field is developed.

INSTRUCTIONAL OBJECTIVES

To guide the students such a way that they carry out a comprehensive work on the chosen topic which will stand them in good stead as they face real life situations. The project work so chosen by the student shall culminate in gaining of major design experience in the related area of specialization.

MAJOR PROJECT

A student is encouraged to take an industrial project with reputed organizations or firms chosen by the institute. In such cases the student will stay with the firm and carry out the project. The project will be guided by the faculty member and the concerned officer in the industry. All the requirements spelt out under 'MAJOR PROJECT' above, shall be incorporated under this work also.

However reviews will be conducted in the institute which the student shall attend.



IT 803 GD/SEMINAR

Group Discussion

Group Discussion (GD) is a methodology used by institutes to gauge whether the candidate has certain personality traits and skills required in education. Group of candidates is given a topic or a situation, given a few minutes to think about the same, and then asked to discuss it among them.

Seminar

This one credit course is meant to give students practice speaking in front of an audience and to explore topics of their own choosing in detail. Students will research topics and organize presentations for faculty and other students. The topics may be any aspect of the technical topic and must be approved by the instructor in advance. To help students improve as speakers, each student will receive feedback from the fellow students and the instructor.

Expectations

Students will submit a detailed outline of their presentation and also a brief abstract (describing their presentation).

Guidelines for a Proposal Seminar

You may give a proposal seminar once during your M.S. program.

Proposal Seminar Format

- Give an introduction and background information on your topic. What relevant research has been performed previously?
- State the problem(s) that remain unanswered.
- Clearly state your objectives and give the specific hypotheses you wish to test.
- Describe the methodology you will use to test your hypotheses. Be sure you fully understand your chosen methods. Give reasons why you chose these methods over other approaches.
- Present any data you have collected thus far.
- Describe what remains to be done, and what you expect to find.
- Explain the significance of your findings (or potential future findings).