Curriculum & Syllabus

of

M.Tech. Information Technology

(For the batch admitted in 2010-11 onwards)

K.S.RANGASAMY COLLEGE OF TECHNOLOGY
TIRUCHENGODE – 637 215

(An Autonomous Institution affiliated to Anna University Chennai and approved by AICTE New Delhi)

K.S.Rangasamy College of Technology - Autonomous Regulation	R 2010
Department	Information Technology
Programme Code & Name	PIT : Information Technology

K.S.Rangasamy College of Technology, Tiruchengode - 637 215								
Curriculum for the Programmes under Autonomous Scheme								
Regulation	R 2010							
Department	Information Technology							
Programme Code & Name	PIT : Information Technology							
Semester I								
Course Code	Course Name	Hours / Week			Credit	Maximum Marks		
		L	T	P	C	CA	ES	Total
	THEORY							
10 PIT 101	Optimization Techniques	3	1	0	4	50	50	100
10 PIT 102	Advanced Java Programming	3	0	0	3	50	50	100
10 PIT 103	Advanced Data Structures And Algorithms	3	0	0	3	50	50	100
10 PIT 104	Computer Communication Networks	3	0	0	3	50	50	100
10 PIT 105	Information Security	3	0	0	3	50	50	100
10 PIT 106	Advanced Database Technology	3	0	0	3	50	50	100
	PRACTICAL							
10 PIT107	Data Structures and Java Programming Laboratory	0	0	3	2	50	50	100
Total		18	01	03	21	700		
Semester II								
Course Code	Course Name	Hours / Week			Credit	Maximum Marks		
		L	T	P	C	CA	ES	Total
	THEORY							
10 PIT 201	Software Engineering Methodologies	3	0	0	3	50	50	100
10 PIT 202	Distributed Component Architecture	3	0	0	3	50	50	100
10 PIT 203	Wireless Mobile Networking	3	0	0	3	50	50	100
10 PIT 204	Advanced Operating Systems	3	0	0	3	50	50	100
10 PIT 205	Principles of Distributed Systems	3	0	0	3	50	50	100
10 PIT E1*	Elective I	3	0	0	3	50	50	100
	PRACTICAL							
10 PIT 206	Advanced Operating Systems and Open Source Laboratory	0	0	3	2	50	50	100
10 PIT207	Technical Report Preparation and Presentation	0	0	2	0	100	00	100
Total		18	00	05	20	800		

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Curriculum for the Programmes under Autonomous Scheme								
Regulation	R 2010							
Department	Information Technology							
Programme Code & Name	PIT : Information Technology							
Semester III								
Course Code	Course Name	Hours / Week			Credit	Maximum Marks		
		L	T	P	C	CA	ES	Total
	THEORY							
10 PIT E2*	Elective II	3	0	0	3	50	50	100
10 PIT E3*	Elective III	3	0	0	3	50	50	100
10 PIT E4*	Elective IV	3	0	0	3	50	50	100
	PRACTICAL							
10 PIT 301	Project Work - Phase I	0	0	12	2	100	00	100
Total		09	00	12	11	400		
Semester IV								
Course Code	Course Name	Hours / Week			Credit	Maximum Marks		
		L	T	P	C	CA	ES	Total
	PRACTICAL							
10 PIT 401	Project Work - Phase II	0	0	40	10	50	50	100
Total		00	00	40	10	100		

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Regulation	R 2010							
Department	Information Technology							
Programme Code & Name	PIT : Information Technology							
Course Code	Course Name	Hours / Week			Credit	Maximum Marks		
		L	T	P	C	CA	ES	Total
Elective I								
10 PIT E11	Ontology and Semantic Web	3	0	0	3	50	50	100
10 PIT E12	Bioinformatics	3	0	0	3	50	50	100
10 PIT E13	Soft Computing	3	0	0	3	50	50	100
10 PIT E14	Embedded Systems	3	0	0	3	50	50	100
10 PIT E15	Data Warehousing and Data Mining	3	0	0	3	50	50	100
10 PIT E16	Digital Image Processing	3	0	0	3	50	50	100
10 PIT E17	Advanced Computer Architecture	3	0	0	3	50	50	100
Elective II								
10 PIT E21	Cloud Computing	3	0	0	3	50	50	100
10 PIT E22	Virtualization Techniques	3	0	0	3	50	50	100
10 PIT E23	Service Oriented Architecture	3	0	0	3	50	50	100
10 PIT E24	Information Retrieval Techniques	3	0	0	3	50	50	100
10 PIT E25	Mobile and Pervasive Computing	3	0	0	3	50	50	100
10 PIT E26	Compiler Design	3	0	0	3	50	50	100
10 PIT E27	Grid Computing	3	0	0	3	50	50	100
Elective III								
10 PIT E31	Adhoc and Sensor Networks	3	0	0	3	50	50	100
10 PIT E32	Enterprise Resource Planning	3	0	0	3	50	50	100
10 PIT E33	Human Resources Management	3	0	0	3	50	50	100
10 PIT E34	Multicore Architecture	3	0	0	3	50	50	100
10 PIT E35	Natural Language Processing	3	0	0	3	50	50	100
10 PIT E36	Web Data Mining	3	0	0	3	50	50	100
10 PIT E37	XML and Web Services	3	0	0	3	50	50	100
Elective IV								
10 PIT E41	Software Quality Management	3	0	0	3	50	50	100
10 PIT E42	Software Testing Methodologies	3	0	0	3	50	50	100
10 PIT E43	Open Source Architecture	3	0	0	3	50	50	100
10 PIT E44	3G Wireless Networks	3	0	0	3	50	50	100
10 PIT E45	C# and .Net	3	0	0	3	50	50	100
10 PIT E46	User Interface Design	3	0	0	3	50	50	100
10 PIT E47	Information System Design	3	0	0	3	50	50	100
10 PIT E48	Research Methodology - Engineering and Management Studies	3	0	0	3	50	50	100
10 PIT E49	Network Routing Algorithms	3	0	0	3	50	50	100
10 PIT E50	Optical Switching Architectures	3	0	0	3	50	50	100

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Department	Information Technology			Programme Code & Name			PIT : Information Technology	
Semester I								
Course Code	Course Name	Hours / Week			Credit	Maximum Marks		
		L	T	P	C	CA	ES	Total
10 PIT 101	OPTIMIZATION TECHNIQUES	3	1	0	4	50	50	100
Objective(s)	Introduce the methods of Optimization Techniques - Emphasize the mathematical procedures of nonlinear programming search techniques - Introducing advance topics such as CPM, PERT and Dynamic programming- Relate the course material to research activities.							
1	LINEAR PROGRAMMING				Total Hrs	12		
Linear Programming: Mathematical Formulation-Simplex method-Two Phase simplex method- Big-M method-Duality - Dual Simplex method-Revised Simplex method.								
2	APPLICATION OF LPP & NON LINEAR PROGRAMMING				Total Hrs	12		
Application Of LPP: Transportation problem– North-west corner rule-Least cost method-VAM (MODI method), Assignment problem- Unbalanced assignment problem – Travelling salesman problem. Non Linear Programming: Unconstrained optimization techniques- Kuhn–Tucker method, WolFe's method.								
3	INTEGER PROGRAMMING				Total Hrs	12		
Formulation of Integer Programming problems - Gomory's cutting plane methods, Branch and Bound Techniques.								
4	DYNAMIC PROGRAMMING AND GAME THEORY				Total Hrs	12		
Characteristics of Dynamic Programming, Bellman's principle of optimality, Concepts of dynamic programming, calculus method of solution. Game Theory: Two Person zero sum Games – Games without saddle Points-Graphic Solution of 2 x n and m x 2 Games- Dominance Property .								
5	PERT/CPM				Total Hrs	12		
Network Construction-computation of earliest start time, latest start time, Total, free and independent float time-Crashing-Computation of optimistic, most likely Pessimistic and expected time – problems.								
Total hours to be taught						60		
Text book (s) :								
1	Kanti Swarup, P.K.Gupta, Man Mohan " Operations Research" Twelfth Edition Sultan Chand & Sons , New Delhi, 2004.							
2	Winston.W.L. "Operations Research", Fourth Edition, Thomson – Brooks/Cole, 2003.							
3	Taha, H.A. "Operations Research: An Introduction", Ninth Edition, Pearson Education Edition, Asia, New Delhi, 2002.							
Reference(s) :								
1	Robertazzi. T.G. "Computer Networks and Systems – Queuing Theory and Performance Evaluation", Third Edition, Springer, 2002 Reprint.							
2	Ross. S.M., "Probability Models for Computer Science", Academic Press, 2002.							

<table>
<tr><td colspan="7">K.S.Rangasamy College of Technology - Autonomous Regulation</td><td>R 2010</td></tr>
<tr><td>Department</td><td colspan="2">Information Technology</td><td colspan="2">Programme Code & Name</td><td colspan="2">PIT : Information Technology</td></tr>
<tr><td colspan="8">Semester I</td></tr>
<tr><td rowspan="2">Course Code</td><td rowspan="2">Course Name</td><td colspan="3">Hours / Week</td><td>Credit</td><td colspan="2">Maximum Marks</td></tr>
<tr><td>L</td><td>T</td><td>P</td><td>C</td><td>CA</td><td>ES</td><td>Total</td></tr>
<tr><td>10 PIT 102</td><td>ADVANCED JAVA PROGRAMMING</td><td>3</td><td>0</td><td>0</td><td>3</td><td>50</td><td>50</td><td>100</td></tr>
<tr><td>Objective(s)</td><td colspan="7">Understand the changing scenario in software development and recent advances in Object Oriented Programming. To design and develop Java Applications, applets and introduce the concepts of JSP and EJB..</td></tr>
<tr><td>1</td><td colspan="4">INTRODUCTION TO JAVA PROGRAMMING</td><td colspan="2">Total Hrs</td><td>9</td></tr>
<tr><td colspan="8">JAVA Features – Exception Handling– Types – Multiple catch classes – Nested Try Statements – throw – throws – finally – User defined Exception – Applets – Initialization and Termination – HTML APPLET Tag – Applet Interface – Database connection – Associating JDBC/ODBC Bridge with the Database – Statement Objects.</td></tr>
<tr><td>2</td><td colspan="4">SERVLET and XML</td><td colspan="2">Total Hrs</td><td>9</td></tr>
<tr><td colspan="8">Life Cycle Servlet – A Simple Servlet – the javax.servlet package – HTTPServlet Request Interface – HTTPServlet Response Interface – HTTPServlet class. Why use XML – Design of XML document –Nesting Elements – Processing Instructions – Attributes – Creating a Document Type Definition(DTD) –CSS – XML Schema – Types of Elements – Attributes – Create an XML Schema – Examples</td></tr>
<tr><td>3</td><td colspan="4">AWT and SWING</td><td colspan="2">Total Hrs</td><td>9</td></tr>
<tr><td colspan="8">AWT-Windows Fundamentals – Working with Frame windows – AWT Controls – Layout Manager ,
SWING – Icons and Labels – Text Fields – Buttons – Combo Boxes – Tabbed Panes – Scroll Panes – Tables.</td></tr>
<tr><td>4</td><td colspan="4">JAVA SERVER PAGES</td><td colspan="2">Total Hrs</td><td>9</td></tr>
<tr><td colspan="8">Introduction – JSP Tags – Request String – User Sessions – Cookies – Implicit Objects – Java Scripting.</td></tr>
<tr><td>5</td><td colspan="4">ENTERPRISE JAVA BEAN</td><td colspan="2">Total Hrs</td><td>9</td></tr>
<tr><td colspan="8">Introduction – EJB classes – EJB Interfaces – Deployment description – Session Java Bean – Entity Java Bean – Message-Driven Bean – JAR File.</td></tr>
<tr><td colspan="7">Total hours to be taught</td><td>45</td></tr>
<tr><td colspan="8">Reference(s) :</td></tr>
<tr><td>1</td><td colspan="7">Herbert Schildt “JAVA Complete Reference” Tata McGraw Hill fifth edition.</td></tr>
<tr><td>2</td><td colspan="7">Jim Keogh “ J2EE The Complete Reference” Tata McGraw Hill.</td></tr>
<tr><td>3</td><td colspan="7">John Zukowski “Mastering JAVA 2” BPB Publications.</td></tr>
<tr><td>4</td><td colspan="7">H.M.Deitel and P.J.Deitel “JAVA How to program “ Sixth edition.</td></tr>
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Semester I								
Course Code	Course Name	Hours / Week			Credit	Maximum Marks		
		L	T	P	C	CA	ES	Total
10 PIT 103	ADVANCED DATA STRUCTURES AND ALGORITHMS	3	0	0	3	50	50	100
Objective(s)	To Understand the concepts of Advanced data structures, to study the algorithms analysis methods and to study different algorithms techniques available to solve problems							

1	INTRODUCTION	Total Hrs	8
Skip Lists and hashing:- Dictionaries, The ADT, Linear list representation, skip list representation, hash table representation, an application- text compression. Binary trees and other trees – trees, binary trees, properties of binary trees, representation of binary trees, common binary tree operations, binary tree traversal, ADT Binary tree, the class LinkedBinaryTree, Applications. Priority Queues- definitions and applications, ADT, linear lists, heaps, leftist trees, applications.			
2	TREES	Total Hrs	9
Tournament trees- winner trees and applications, ADT WinnerTree, Winner tree implementation, loser trees, applications. Binary search trees- definitions, ADT, operations and implementations, binary search trees with duplicates, indexed binary search trees, applications. Balanced search trees- AVL trees, Red-Black trees, Splay trees, B-trees.			
3	MULTIWAY TREES AND GRAPH	Total Hrs	10
Family of B-trees – B*-trees, B+-trees, prefix B+-trees, Bit-trees, R-trees, 2-4 trees, sets and maps in java, Tries.Graphs – definitions, applications and more definitions, properties, ADT graph, representation of unweighted graph, representation of weighted graph, class implementations, graph search methods, applications			
4	ALGORITHM ANALYSIS	Total Hrs	9
Performance analysis- space complexity, time complexity. Asymptotic notation – introduction, big Oh notation, Omega notation and theta notation. Asymptotic mathematics, complexity analysis examples. Practical complexities. Performance measurement – choosing instance size, developing the test data, setting up the experiment, example. The Greedy method – optimization problem, greedy method, applications. Divide and Conquer – method, applications, solving recurrence equations, lower bounds on complexity.			
5	ALGORITHM DESIGN METHODS	Total Hrs	9
Dynamic programming, - the method, applications. Backtracking – method, applications. Branch and bound-method and applications. NP-hard and NP-complete problems – concepts, Cook's theorem, NP-hard graph problems, NP-hard scheduling problems			
Total hours to be taught			45
Reference(s) :			
1	Sartaj Sahni, " Data structures, algorithms and applications in Java", University Press, 2nd edition ,2005		
2	Adam Drozdek, "Data structures and algorithms in Java", Brooks/Cole, Thomson Learning, Vikas Publishing House, 2001		
3	Ellis Horowitz, Sataj Sahni, Sanguthevar Rajasekaran, " Fundamentals of Computer Algorithms", Galgotia Publisher, 2002		

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<tr><td colspan="2">Department</td><td colspan="2">Information Technology</td><td colspan="2">Programme Code & Name</td><td colspan="3">PIT : Information Technology</td></tr>
<tr><td colspan="9">Semester I</td></tr>
<tr><td rowspan="2">Course Code</td><td rowspan="2" colspan="2">Course Name</td><td colspan="3">Hours / Week</td><td>Credit</td><td colspan="3">Maximum Marks</td></tr>
<tr><td>L</td><td>T</td><td>P</td><td>C</td><td>CA</td><td>ES</td><td>Total</td></tr>
<tr><td>10 PIT 104</td><td colspan="2">COMPUTER COMMUNICATION NETWORKS</td><td>3</td><td>0</td><td>0</td><td>3</td><td>50</td><td>50</td><td>100</td></tr>
<tr><td>Objective(s)</td><td colspan="8">Understanding the concepts of Data Communications and to study the functions of different layers and detailed analysis of QoS parameters in Computer Networking.</td></tr>
<tr><td>1</td><td colspan="5">OVERVIEW OF PHYSICAL AND DATA LINK LAYER</td><td colspan="2">Total Hrs</td><td>10</td></tr>
<tr><td colspan="9">Uses of Computer Networks - Network Architecture - Implementing Network Software –Reference Model (ISO-OSI, TCP/IP Overview) - Overview of Physical and Data Link layer – Encoding – Framing - Reliable Transmission - Flow control: Stop-and-Wait Flow Control - Sliding Window Protocol - Error Detection and Correction Techniques - Error Control - ARQ: Stop and Wait, Go-back-N, Selective Reject, Transmission Efficiency of ARQ Protocols - Data Link Control protocols: HDLC, Point-to-Point Protocol-Ethernet-Rings-Wireless-Network devices-repeaters, hubs, switches and bridges.</td></tr>
<tr><td>2</td><td colspan="5">NETWORK LAYER</td><td colspan="2">Total Hrs</td><td>9</td></tr>
<tr><td colspan="9">Internetworking – Simple Internetworking-IPv4-IPv6-IP Protocol, IP addresses (class A, B, C etc.), Subnet Addressing – classless Addressing – CDIR- ARP- RARP-Routing Algorithms-Shortest Path algorithm: Dijkstra's Algorithm, Bellman-Ford Algorithm, Fixed Routing, Flooding, Random Routing, Adaptive Routing: Flow based Routing, Distance Vector Routing, Link State Routing, Hierarchical Routing, Broadcast and Multicast Routing: Multi-destination routing, Spanning Tree Routing, Reverse Path Forwarding- Routing Characteristics.</td></tr>
<tr><td>3</td><td colspan="5">TRANSPORT LAYER</td><td colspan="2">Total Hrs</td><td>9</td></tr>
<tr><td colspan="9">End-to-End Protocols – UDP-TCP-Remote Procedure Call -Congestion Control and Resource Allocation Issues - Queuing Discipline-TCP Congestion Control-Congestion General principles - Congestion Prevention Policies: Traffic Shaping, Leaky-Bucket Algorithm, Token Bucket Algorithm, Choke Packets, Weighted Fair Queuing, Hop-by-Hop Choke Packets, Load Shedding, Jitter Control, RSVP .</td></tr>
<tr><td>4</td><td colspan="5">APPLICATION LAYER</td><td colspan="2">Total Hrs</td><td>8</td></tr>
<tr><td colspan="9">Application Layer - Traditional Applications-Web Services-Multimedia Applications- DNS - SNMP-RMON-WWW – Electronic mail - Overlay networks.</td></tr>
<tr><td>5</td><td colspan="5">DETAILED QoS PARAMETERS ANALYSIS</td><td colspan="2">Total Hrs</td><td>9</td></tr>
<tr><td colspan="9">QoS parameters for network service – bandwidth - delay-Bandwidth-Delay Product (BDP) - jitter- data loss - packet drops – data rate - traffic characteristics - traffic management – Techniques to improve QoS -Integrated services-Differentiated services</td></tr>
<tr><td colspan="7">Total hours to be taught</td><td>45</td></tr>
<tr><td colspan="9">Text book (s) :</td></tr>
<tr><td>1</td><td colspan="8">Larry L.Peterson and Bruce D. Davie, "Computer Networks A Systems Approach", Edition 4. Elsevier, Morgan Kaufmann Publishers, 2007</td></tr>
<tr><td>2</td><td colspan="8">Behrouz A. Forouzan, "Data communication and Networking", McGraw-Hill, Fourth Edition , 2006.</td></tr>
<tr><td colspan="9">Reference(s) :</td></tr>
<tr><td>1</td><td colspan="8">Andrew S. Tanenbaum, "Computer Networks", PHI, Fourth Edition, 2003.</td></tr>
<tr><td>2</td><td colspan="8">William Stallings, "Data and Computer Communication", Eighth Edition, Pearson Education, 2007.</td></tr>
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		L	T	P	C	CA	ES	Total
10 PIT 105	INFORMATION SECURITY	3	0	0	3	50	50	100
Objective(s)	Understanding the basics of information security and to know the legal, ethical and professional issues in Information Security							

1	INTRODUCTION	Total Hrs	9
History, What is Information Security?, Critical Characteristics of Information, NSTISSC Security Model, Components of an Information System, Securing the Components, Balancing Security and Access, The SDLC, The Security SDLC.			
2	SECURITY INVESTIGATION	Total Hrs	9
Need for Security, Business Needs, Threats, Attacks, Legal, Ethical and Professional Issues.			
3	SECURITY ANALYSIS	Total Hrs	9
Risk Management: Identifying and Assessing Risk, Assessing and Controlling Risk.			
4	LOGICAL DESIGN	Total Hrs	9
Blueprint for Security, Information Security Policy, Standards and Practices, ISO 17799/BS 7799, NIST Models, VISA International Security Model, Design of Security Architecture, Planning for Continuity			
5	PHYSICAL DESIGN AND IMPLEMENTATION	Total Hrs	9
Security Technology, IDS, Honey Pots, Honey Nets, and Padded Cell Systems, Scanning and Analysis Tools, Access Control Devices, Implementing Information Security, Project Management for Information Security, Technical Topics of Implementation, Nontechnical Aspects of Implementation.			
Total hours to be taught			45

Text book (s) :	
1	Michael E Whitman and Herbert J Mattord, “Principles of Information Security”, Thomson (Cengage) Indian 3rd Edition.2007
2	Matt Bishop, “Computer Security Art and Science”, Pearson/PHI, 2005.
Reference(s) :	
1	Stuart Mc Clure, Joel Scrambray, George Kurtz, “Hacking Exposed”, Tata McGraw-Hill, 2003
2	Micki Krause, Harold F. Tipton, “Handbook of Information Security Management”, Vol 1-3 CRC Press LLC, 2004.

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		L	T	P	C	CA	ES	Total
10 PIT 106	ADVANCED DATABASE TECHNOLOGY	3	0	0	3	50	50	100
Objective(s)	To learn the fundamentals of data models and to conceptualize and depict a database system using ER diagram, make a study of SQL, know the fundamental concepts of transaction processing- concurrency control techniques and recovery procedure - have an introductory knowledge about the emerging trends in the area of distributed DB- OODB.							
1	INTRODUCTION				Total Hrs	9		
Review of Relational Model – Database System Structure – Database Architecture – Database Languages – SQL concepts – Other Relational Languages – The Tuple Relational Calculus – The Domain Relational Calculus.								
2	DATABASE DESIGN ISSUES				Total Hrs	9		
ER Model – Normalization (1NF – 4NF) – Advanced SQL - .Integrity Constraints – Procedures and Functions – JDBC - Database Tuning – Query Optimization – Active databases – Temporal databases – Multimedia databases.								
3	TRANSACTION PROCESSING				Total Hrs	9		
Introduction – Transaction – Serializability - Concurrency control – Lock-based protocols – Timestamp-based protocols – Validation-based protocols – Recovery system – Log-Based Recovery- Recovery with concurrent transactions								
4	DISTRIBUTED DATABASES				Total Hrs	9		
Homogeneous and Heterogeneous databases – Distributed Data Storage – Distributed Transactions – Commit protocols – Concurrency control in DDB – Locking protocols – Deadlock handling – Heterogeneous DDB – Schema Translation and Schema Integration								
5	OBJECT ORIENTED DATABASES				Total Hrs	9		
Object-Oriented data models – Object identity and its implementation – Supporting object modeling in database systems – Database Programming and querying in object–oriented databases – ODMG standard, including ODL, OQL – Comparing RDBMS with OODBMS.								
Total hours to be taught						45		
Reference(s) :								
1	Abraham Silberschatz, Henry F. Korth and S. Sudarshan - “Database System Concepts”, Fifth Edition, McGraw-Hill, 2006.							
2	Ramez Elmasri and Shamkant B. Navathe, “Fundamental Database Systems”, Third Edition, Pearson Education, 2003.							
3	Raghu Ramakrishnan, “Database Management System”, Tata McGraw-Hill Publishing Company, 2003.							

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		L	T	P	C	CA	ES	Total
10 PIT 107	DATA STRUCTURES AND JAVA PROGRAMMING LABORATORY	0	0	3	2	50	50	100

1. Min/Max Heaps (Insertion, Delete min/Delete Max)
2. Binary Search Trees (Insertion, Deletion and Search)
3. AVL Trees (Insertion, Deletion and Search)
4. B-Trees (Insertion, Deletion and Search)
5. Finding Spanning Trees
6. Finding connected components of a graph
7. Depth-first and Breadth-first searches
8. Exception Handling
9. Creating an Applet.
10. Programs using Java Servlet
11. Remote method Invocation (RMI)
12. Programs using JSP

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10 PIT 201	SOFTWARE ENGINEERING METHODOLOGIES	3	0	0	3	50	50	100
Objective(s)	To be aware of Different life cycle models, requirement dictation process, analysis modeling and specification, architectural and detailed design methods, implementation and testing strategies, project planning and management, use of CASE tools.							
1	SOFTWARE PROCESS				Total Hrs	9		
A Generic View Of Processes – Process Models: Waterfall – Incremental – Evolutionary Process Model – Component Based Development. An Agile View of Process System Engineering – Risk Management: Risk Identification – Risk Projection – Risk Refinement.								
2	REQUIREMENT ANALYSIS				Total Hrs	9		
Requirement Engineering: Tasks, Initiating The Requirements Engineering Process, Eliciting Requirements, Developing Use Cases – Negotiating Requirements – Validating Requirements – Building The Analysis Models: Data Modeling Concepts –Object Oriented Analysis- Scenario Based Modeling - Flow Oriented Modeling – Class Based Modeling – Behavioral Model.								
3	SOFTWARE DESIGN				Total Hrs	9		
Design Concepts – Design Models – Pattern Based Software Design – Architectural Design – Data Design – Architectural Design and Patterns – Mapping Data Flow into a Software Architecture –User Interface Analysis and Design.								
4	SOFTWARE TESTING				Total Hrs	9		
Software Testing – Strategies – Issues – Test Strategies For Conventional And Object Oriented Software – Validation Testing – System Testing – Testing Tactics: White Box Testing, Basis Path Testing – Control Structure Testing – Black Box Testing –Object Oriented Testing Methods– Testing GUI – Testing Client/Server – Test Documentation.								
5	SOFTWARE PROJECT ESTIMATION AND MANAGEMENT				Total Hrs	9		
Quality Concepts – Software Quality Assurance – Estimation – Software Project Estimation – Decomposition Techniques: Software Sizing – Problem Based Estimation – An Example of LOC Based Estimation – An Example of FP Based Estimation – Empirical Estimation Models –Change Management- Project Scheduling – Reengineering: Reverse Engineering-CASE Tools.								
Total hours to be taught						45		
Text book :								
1	Roger S. Pressman., Software Engineering: A Practitioner's Approach (Sixth Edition), McGraw Hill, 2005.							
Reference (s) :								
1	I.Sommerville, Software Engineering, V Edition: Addison Wesley, 1996.							
2	Pankaj Jalote- An Integrated Approach to Software Engineering, Springer Verlag, 1997.							
3	James F Peters and Witold Pedryez, "Software Engineering – An Engineering Approach", John Wiley and Sons, New Delhi, 2000.							
4	Fairely, "Software Engineering Concepts", McGraw Hill, 1995.							

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Department	Information Technology			Programme Code & Name		PIT : Information Technology		
Semester II								
Course Code	Course Name	Hours / Week			Credit	Maximum Marks		
		L	T	P	C	CA	ES	Total
10 PIT 202	DISTRIBUTED COMPONENT ARCHITECTURE	3	0	0	3	50	50	100
Objective(s)	To study the CORBA technologies, to learn about COM and DCOM , to study about EJB and .NET features							

1	INTRODUCTION	Total Hrs	9
Evolution of Distributed Systems – Distributed Objects – Issues in design of Distributed Object Systems- Multi tier architectures- Component concepts – Component Architecture - Component based Software Development.			
2	CORBA TECHNOLOGIES	Total Hrs	9
OMA – CORBA architecture - Object Request Broker Structure – Interface Definition language –– Portable Object Adapter – Object and invocation life cycles - Interceptors - CORBA services – Object location service – Messaging service – Security – Transaction service - CORBA Component Model.			
3	COM AND DCOM	Total Hrs	9
Evolution of DCOM – OLE - ActiveX – ATL – COM IDL – Error handling in COM - COM Interfaces – COM threading models - DCOM services – Security - MTS –Clustering in DCOM – Message Queuing.			
4	ENTERPRISE JAVA BEANS	Total Hrs	9
Introduction – EJB architecture – Types of Enterprise Beans – Life cycle of Beans – Steps in creating and deploying an EJB application – EJB containers			
5	COMPONENT OBJECT MODELS, FRAMEWORKS AND DEVELOPMENT	Total Hrs	9
Java RMI - Java Beans – MDA – DOT NET - CCM – Connectors – CLR contexts and channels – Black box component framework – Component-oriented programming – Component design and implementation tools – testing tools – assembly tools			
Total hours to be taught			45

Reference (s) :

1	G Sudha Sadasivam, “Distributed Component Architecture”, Wiley India Pvt. Ltd., New Delhi, 2007.
2	Clemens Szyperski, “Component Software: Beyond Object-Oriented Programming”, Pearson Education, New Delhi, 2003
3	Ed Roman, “Enterprise Java Beans”, Wiley, New York, 2004
4	Gerald Brose, Andreas Vogel, Keith Duddy, “Java Programming with CORBA”, John Wiley, New York, 2003.

<table>
<tr><td colspan="7">K.S.Rangasamy College of Technology - Autonomous Regulation</td><td>R 2010</td></tr>
<tr><td>Department</td><td colspan="2">Information Technology</td><td colspan="2">Programme Code & Name</td><td colspan="2">PIT : Information Technology</td></tr>
<tr><td colspan="8">Semester II</td></tr>
<tr><td rowspan="2">Course Code</td><td rowspan="2">Course Name</td><td colspan="3">Hours / Week</td><td>Credit</td><td colspan="2">Maximum Marks</td></tr>
<tr><td>L</td><td>T</td><td>P</td><td>C</td><td>CA</td><td>ES</td><td>Total</td></tr>
<tr><td>10 PIT 203</td><td>WIRELESS MOBILE NETWORKING</td><td>3</td><td>0</td><td>0</td><td>3</td><td>50</td><td>50</td><td>100</td></tr>
<tr><td>Objective(s)</td><td colspan="7">To develop advanced network building skills and to study performance issues in advanced wireless and mobile networks.</td></tr>
<tr><td>1</td><td colspan="4">INTRODUCTION</td><td>Total Hrs</td><td colspan="2">8</td></tr>
<tr><td colspan="8">Fundamentals of wireless and mobile systems – IEEE 802.11 – Wireless LANS PANS, WANS and MANS – Wireless Internet - Ad hoc Wireless Networks – Wireless devices service technologies, SMS, USSD, WAP, VXML –Wireless Operating Systems Blackberry, Palm, EPOC.</td></tr>
<tr><td>2</td><td colspan="4">MAC PROTOCOLS</td><td>Total Hrs</td><td colspan="2">9</td></tr>
<tr><td colspan="8">Issues in designing MAC Protocol and goals – Detailed classification – Sensor networks – Mesh networks – Hybrid Networks.</td></tr>
<tr><td>3</td><td colspan="4">ADHOC ROUTING PROTOCOLS</td><td>Total Hrs</td><td colspan="2">10</td></tr>
<tr><td colspan="8">Introduction – Issues of routing protocols – Classification – DSDV, WRP, CSGR, DSR, AODV, TORA, ZRP, OLSR, HSRP, PAR – Issues in designing multicast routing protocols - Operation of Multicast routing protocols – Architecture – Classification.</td></tr>
<tr><td>4</td><td colspan="4">TRANSPORT LAYER AND SECURITY PROTOCOLS</td><td>Total Hrs</td><td colspan="2">9</td></tr>
<tr><td colspan="8">Issues in designing a transport layer protocol for ad hoc networks – Goals – Classification – TCP over ad hoc networks – Security issues in ad hoc networks – Security requirements – Attacks – Key management – Secure routing in ad hoc networks.</td></tr>
<tr><td>5</td><td colspan="4">QoS AND ENERGY MANAGEMENT</td><td>Total Hrs</td><td colspan="2">9</td></tr>
<tr><td colspan="8">Issues and challenges in providing the QoS in wireless networks – Classification of QoS solutions – MAC layer solutions – Network layer solutions – QoS frame work for wireless networks – Need for energy management – Energy management schemes – Battery management - Transmission power management – System power management.</td></tr>
<tr><td colspan="6">Total hours to be taught</td><td colspan="2">45</td></tr>
<tr><td colspan="8">Reference(s) :</td></tr>
<tr><td>1</td><td colspan="7">C. Siva Ram Murthy, B.S. Manoj, “Ad Hoc Wireless Networks – Architecture and Protocols”, Pearson Education, 2006.</td></tr>
<tr><td>2</td><td colspan="7">Dan Harkey et al. “Wireless Java Programming for Enterprise Application: Mobile Devices Go Corporate”, Wiley Dreamtech 2005.</td></tr>
<tr><td>3</td><td colspan="7">Karch Pahlavan, Prashant Krishnamoorthy, “Principles of Wireless Network – A unified Approach,” Pearson Education, 2002.</td></tr>
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K.S.Rangasamy College of Technology - Autonomous Regulation								R 2010
Department	Information Technology		Programme Code & Name			PIT : Information Technology		
Semester II								
Course Code	Course Name	Hours / Week			Credit	Maximum Marks		
		L	T	P	C	CA	ES	Total
10 PIT 204	ADVANCED OPERATING SYSTEMS	3	0	0	3	50	50	100
Objective(s)	To have an overview of different types of operating systems, know the components of an operating system, have a thorough knowledge of process management, have a thorough knowledge of storage management, know the concepts of file systems, know the concepts of Distributed systems.							
1	INTRODUCTION				Total Hrs	9		
Main frame Systems, Desktop Systems – Multiprocessor Systems – Distributed Systems – Clustered Systems – Real Time systems – Hand held Systems, Operating Systems Structures: System Components – Operating System Services - System calls - System Programs – System Design and Implementation - CPU scheduling: Basic Concepts – Scheduling Algorithms.								
2	PROCESS MANAGEMENT				Total Hrs	9		
Process Concepts - Process Scheduling - Operation on Process - Co-Operating process - Inter Process Communication - Threads: Multithreading Models - Process Synchronization: The Critical Section Problem – Synchronization Hardware - Semaphores – classical problem of Synchronization - Deadlock: Deadlock Characterization - Methods for handling Deadlocks - Deadlock Prevention – Deadlock Avoidance - Deadlock Detection – Recovery from Deadlock.								
3	MEMORY MANAGEMENT				Total Hrs	9		
Background – Swapping - Contiguous Memory Allocation - Paging - Segmentation – Segmentation with paging - Virtual Memory: Demand paging - Page Replacement – Thrashing - Buddy Systems – Storage Compaction								
4	FILE SYSTEMS				Total Hrs	9		
File Concepts - Access methods - Directory Structure - File Protection – File System Implementation: File System Structure and Implementation – Directory Implementation – Allocation methods - Free Space Management – Recovery - Disk Structure – Disk Scheduling.								
5	DISTRIBUTED OPERATING SYSTEM				Total Hrs	9		
Design issues in distributed operating system-Distributed file systems – Naming and Transparency-Remote File Access- Stateful versus Stateless service –Distributed Coordination -Mutual Exclusion- Atomicity- Concurrency Control- Deadlock Handling-Election Algorithms-Case Study-Linux system, Windows.								
Total hours to be taught						45		
Text book :								
1	Abraham Silberschatz, Peter Baer Galvin and Greg Gagne, “Operating System Concepts”, Sixth Edition, John Wiley & Sons (ASIA) Pvt. Ltd, 2003.							
2	Pradeep K.Sinha, “Distributed OS concepts and Design”, IEEE computer Society Press, PHI 1998.							
Reference(s) :								
1	Andrew S. Tanenbaum , “Modern Operating Systems”, PHI , 2nd Edition 2001							
2	Achut S. Godbole and Kahate Atul , “Operating Systems & Systems Programming ”, Tata Mcgraw Hill, 2003.							
3	Charles Crowley, “Operating systems: A Design Oriented Approach”, Tata McGraw Hill, 1999.							
4	Pramod Chandra P. Bhatt – “An Introduction to Operating Systems, Concepts and Practice”, PHI, 2003.							
5	Harvey M. Deitel, “Operating Systems”, Second Edition, Pearson Education Pvt. Ltd, 2002.							

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<tr><td colspan="2">Department</td><td colspan="2">Information Technology</td><td colspan="2">Programme Code & Name</td><td colspan="3">PIT : Information Technology</td></tr>
<tr><td colspan="10">Semester II</td></tr>
<tr><td rowspan="2">Course Code</td><td rowspan="2" colspan="2">Course Name</td><td colspan="3">Hours / Week</td><td>Credit</td><td colspan="3">Maximum Marks</td></tr>
<tr><td>L</td><td>T</td><td>P</td><td>C</td><td>CA</td><td>ES</td><td>Total</td></tr>
<tr><td>10 PIT 205</td><td colspan="2">PRINCIPLES OF DISTRIBUTED SYSTEMS</td><td>3</td><td>0</td><td>0</td><td>3</td><td>50</td><td>50</td><td>100</td></tr>
<tr><td>1</td><td colspan="5">INTRODUCTION</td><td colspan="2">Total Hrs</td><td>8</td></tr>
<tr><td colspan="10">Introduction - Distributed Data Processing - Promises of Distributed Databases - Complicating Factors - Problem Areas – Characterization of Distributed Systems – Examples of distributed systems – Resource sharing and the web – Challenges – System Models – Fundamental models – Interaction Model ,Failure Model ,Security model.</td></tr>
<tr><td>2</td><td colspan="5">DISTRIBUTED DBMS ARCHITECTURE AND DESIGN</td><td colspan="2">Total Hrs</td><td>9</td></tr>
<tr><td colspan="10">Distributed DBMS architecture – Client/Server Systems, Peer-to-Peer Distributed Systems, MDBS Architecture, Distributed Database Design - Alternative Design Strategies - Distributed Design issues – Fragmentation - Allocation - Semantic Data Controls-Data Security.</td></tr>
<tr><td>3</td><td colspan="5">QUERY PROCESSING</td><td colspan="2">Total Hrs</td><td>10</td></tr>
<tr><td colspan="10">Query Processing Problem – Objectives - Characteristics of Query Processors - languages, Type of Optimization, Optimization timing, Statistics, Decision Sites, Exploitation of network Topologies and replicated fragments, use of semi joins - Layers of Query Processing – Distributed Query Optimization Algorithms – Distributed INGRES Algorithm, R* Algorithm, SDD-1 Algorithm.</td></tr>
<tr><td>4</td><td colspan="5">DISTRIBUTED DBMS RELIABILITY AND PARALLEL DATABASE SYSTEM</td><td colspan="2">Total Hrs</td><td>9</td></tr>
<tr><td colspan="10">Reliability Concepts and Measures – Failures and Fault Tolerance in Distributed Systems – Failures in Distributed DBMS – Local Reliability Protocol - Distributed Reliability Protocol-Components-Two Phase Commit Protocol - Variations of 2pc. Database Server - Parallel architecture - Database Interoperability - Database Integration - Query Processing - Transaction Management.</td></tr>
<tr><td>5</td><td colspan="5">CURRENT ISSUES</td><td colspan="2">Total Hrs</td><td>9</td></tr>
<tr><td colspan="10">Data Delivery Alternatives-Data Warehousing- World Wide Web-Architecture and Protocols, Database Access, Semi structured Data, Architecture for Information Integration –Research Projects and Open Issues - Push based Techniques – Mobile Databases – Directory Management, Caching, Broadcast Data, Query Processing and Optimization, Transaction Management</td></tr>
<tr><td colspan="8">Total hours to be taught</td><td>45</td></tr>
<tr><td colspan="10">Reference(s) :</td></tr>
<tr><td>1</td><td colspan="9">M.Tamer Ozsu, Patrick Valduriez, S.Sridar “Principles of Distributed Database Systems”, Pearson Education 1999, 2nd edition..</td></tr>
<tr><td>2</td><td colspan="9">George Couloris, Jean Dollimore, Tim Kindberg “Distributed Systems”Pearson Education 2005, 4TH edition.</td></tr>
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K.S.Rangasamy College of Technology - Autonomous Regulation								R 2010
Department	Information Technology		Programme Code &Name			PIT : Information Technology		
Semester II								
Course Code	Course Name	Hours / Week			Credit	Maximum Marks		
		L	T	P	C	CA	ES	Total
10 PIT 206	ADVANCED OPERATING SYSTEMS AND OPEN SOURCE LABORATORY	0	0	3	2	50	50	100

(Implement the following on LINUX platform. Use C and scripting language implementation)

To teach the concepts of Linux, Internet applications, Security with Open Source and give practical training in installing & configuring various applications.

1. Shell programming
   - ❖ command syntax
   - ❖ write simple functions
   - ❖ basic tests
2. Shell programming
   - ❖ loops
   - ❖ patterns
   - ❖ expansions
   - ❖ substitutions
3. Implementation of the following CPU scheduling algorithms
   - ❖ FCFS
   - ❖ RR
   - ❖ SJF
4. Implementation of FIFO page replacement algorithms.
5. Implementation of Best-fit, First-fit algorithms for memory management.
6. Installation of Open Source – Desktop Linux OS, GNOME & KDE configuration.
7. Installation of Open Office, Mail client & Web/internet browser and configuration.
8. User Creation, Group Creation.
9. Configuration of DNS, DHCP.
10. Configuration of device like Printer, Scanner, Ethernet and TCP /IP.
11. Python programming
    - ❖ Simple statements
    - ❖ Compound statements
    - ❖ Functions
12. Perl programming
    - ❖ Arithmetic operation
    - ❖ Loop
    - ❖ String
    - ❖ functions

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<tr><td colspan="9">Semester II</td></tr>
<tr><td rowspan="2">Course Code</td><td rowspan="2" colspan="2">Course Name</td><td colspan="3">Hours / Week</td><td>Credit</td><td colspan="2">Maximum Marks</td></tr>
<tr><td>L</td><td>T</td><td>P</td><td>C</td><td>CA</td><td>ES</td><td>Total</td></tr>
<tr><td>10 PIT 207</td><td colspan="2">TECHNICAL REPORT PREPARATION AND PRESENTATION</td><td>0</td><td>0</td><td>2</td><td>0</td><td>100</td><td>00</td><td>100</td></tr>
<tr><td>Objective(s)</td><td colspan="8">To exposure the students to refer, read and review the research articles in referred journals and conference proceedings, to Improve the technical report writing and presentation skills of the students.</td></tr>
<tr><td>Methodology</td><td colspan="8">• Each student is allotted to a faculty of the department by the HOD.
• By mutual discussions, the faculty guide will assign a topic in the general / subject area to the student.
• The students have to refer the Journals and Conference proceedings and collect the published literature.
• The student is expected to collect atleast 20 such Research Papers published in the last 5 years.
• Using OHP/Power Point, the student has to make presentation for 15-20 minutes followed by 10 minutes discussion.
• The student has make two presentations, one at the middle and the other near the end of the semester.
• The student has to write a Technical Report for about 30-50 pages (Title page, One page Abstract, Review of Research paper under various subheadings, Concluding Remarks and List of References). The technical report has to be submitted to the HOD one week before the final presentation, after the approval of the faculty guide.</td></tr>
<tr><td rowspan="9">Execution</td><td>Week</td><td colspan="7">Activity</td></tr>
<tr><td>I</td><td colspan="7">Allotment of Faculty Guide by the HoD</td></tr>
<tr><td>II</td><td colspan="7">Finalizing the topic with the approval of Faculty Guide</td></tr>
<tr><td>III-IV</td><td colspan="7">Collection of Technical papers</td></tr>
<tr><td>V-VI</td><td colspan="7">Mid semester presentation</td></tr>
<tr><td>VII-VIII</td><td colspan="7">Report writing</td></tr>
<tr><td>IX</td><td colspan="7">Report submission</td></tr>
<tr><td>X-XI</td><td colspan="7">Final presentation</td></tr>
<tr><td rowspan="7">Evaluation</td><td colspan="8">❖ 100% by Continuous Assessment
❖ 2 Hrs/week</td></tr>
<tr><td colspan="6">Component</td><td colspan="2">Weightage</td></tr>
<tr><td colspan="6">Mid semester presentation</td><td colspan="2">25%</td></tr>
<tr><td colspan="6">Final presentation (Internal)</td><td colspan="2">25%</td></tr>
<tr><td colspan="6">End Semester Examination Report</td><td colspan="2">30%</td></tr>
<tr><td colspan="6">Presentation</td><td colspan="2">20%</td></tr>
<tr><td colspan="6">Total</td><td colspan="2">100%</td></tr>
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<tr><td>Department</td><td colspan="3">Information Technology</td><td colspan="2">Programme Code &Name</td><td colspan="3">PIT : Information Technology</td></tr>
<tr><td colspan="9">Semester III</td></tr>
<tr><td rowspan="2">Course Code</td><td rowspan="2" colspan="2">Course Name</td><td colspan="3">Hours / Week</td><td>Credit</td><td colspan="2">Maximum Marks</td><td></td></tr>
<tr><td>L</td><td>T</td><td>P</td><td>C</td><td>CA</td><td>ES</td><td>Total</td></tr>
<tr><td>10 PIT 301</td><td colspan="2">PROJECT WORK - PHASE I</td><td>0</td><td>0</td><td>12</td><td>2</td><td>100</td><td>00</td><td>100</td></tr>
<tr><td>Objective(s)</td><td colspan="8">Imparting the practical knowledge to the students and also to make them to carry out the technical procedures in their project work, providing an exposure to the students to refer, read and review the research articles, journals and conference proceedings relevant to their project work and placing this as their beginning stage for their final presentation.</td></tr>
<tr><td>Methodology</td><td colspan="8">• Three reviews have to be conducted by the committee of minimum of three members one of which should be the guide
• Problem should be selected
• Students have to collect about 20 papers related to their work
• Reports has to be prepared by the students as per the format.
• Preliminary implementation can be done if possible
• Internal evaluation has to be done for 100 Marks</td></tr>
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<tr><td colspan="8">K.S.Rangasamy College of Technology - Autonomous Regulation</td><td>R 2010</td></tr>
<tr><td>Department</td><td colspan="3">Information Technology</td><td colspan="2">Programme Code &Name</td><td colspan="3">PIT : Information Technology</td></tr>
<tr><td colspan="9">Semester IV</td></tr>
<tr><td rowspan="2">Course Code</td><td rowspan="2" colspan="2">Course Name</td><td colspan="3">Hours / Week</td><td>Credit</td><td colspan="2">Maximum Marks</td><td></td></tr>
<tr><td>L</td><td>T</td><td>P</td><td>C</td><td>CA</td><td>ES</td><td>Total</td></tr>
<tr><td>10 PIT 401</td><td colspan="2">PROJECT WORK - PHASE II</td><td>0</td><td>0</td><td>40</td><td>10</td><td>50</td><td>50</td><td>100</td></tr>
<tr><td>Objective(s)</td><td colspan="8">Enabling and strengthening the students to carry out the project on their own and to implement their innovative ideas to forefront the risk issues and to retrieve the hazards by adopting suitable assessment methodologies and stating it to global.</td></tr>
<tr><td>Methodology</td><td colspan="8">• Three reviews have to be conducted by the committee of minimum of three members one of which should be the guide
• Each review has to be evaluated for 100 Marks
• Attendance is compulsory for all reviews. If a student fails to attend review for some valid reason, one or more chance may be given
• They should publish the paper preferably in the journals / conference
• Final review will be done by the committee that consists of minimum of three members one of which should be the guide (If possible include one external expert examiner within the college)
• The Report should be submitted by the students around at the end of May.</td></tr>
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<tr><td>L</td><td>T</td><td>P</td><td>C</td><td>CA</td><td>ES</td><td>Total</td></tr>
<tr><td colspan="2">10 PIT E11</td><td colspan="2">ONTOLOGY AND SEMANTIC WEB</td><td>3</td><td>0</td><td>0</td><td>3</td><td>50</td><td>50</td><td>100</td></tr>
<tr><td colspan="2">Objective(s)</td><td colspan="8">To study about Ontology, to study languages gor semantic web, to learn taxonomy for Ontology, to study Ontology tools and applications</td></tr>
<tr><td>1</td><td colspan="5">INTRODUCTION</td><td colspan="2">Total Hrs</td><td colspan="2">9</td></tr>
<tr><td colspan="10">Significance of Ontology – constructing ontologies manually – Reusing ontologies –semiautomatic ontology acquisition – ontology mapping- On-To-Knowledge Semantic Web architecture</td></tr>
<tr><td>2</td><td colspan="5">FOUNDATIONS OF OUTSANTING ONTOLOGIES</td><td colspan="2">Total Hrs</td><td colspan="2">9</td></tr>
<tr><td colspan="10">Main components of ontology – Types – Ontological commitments – Ontological categories – Knowledge representation ontologies – Top Level Ontologies – Linguistic ontologies – Domain ontologies</td></tr>
<tr><td>3</td><td colspan="5">METHODOLOGIES AND METHODS FOR BUILDING ONTOLOGY</td><td colspan="2">Total Hrs</td><td colspan="2">9</td></tr>
<tr><td colspan="10">Ontology development process – methodology evolution – development methods and methodologies – learning methods</td></tr>
<tr><td>4</td><td colspan="5">ONTOLOGY LANGUAGES</td><td colspan="2">Total Hrs</td><td colspan="2">9</td></tr>
<tr><td colspan="10">Selection of ontology language – traditional ontology – ontolingua and KIF – LOOM – OKBC – OCML – Flogic</td></tr>
<tr><td>5</td><td colspan="5">ONTOLOGY MARKUP LANGUAGES AND TOOLS</td><td colspan="2">Total Hrs</td><td colspan="2">9</td></tr>
<tr><td colspan="10">Ontology markup languages – SHOE – XOL – RDF(S) – OIL – DAML+OIL – OWL – Ontology development tools and tools suites</td></tr>
<tr><td colspan="8">Total hours to be taught</td><td colspan="2">45</td></tr>
<tr><td colspan="10">Text Book(s):</td></tr>
<tr><td>1</td><td colspan="9">Asuncion Gomez-Perez, Oscar Corcho, Mariano Fernandez-Lopez “Ontological Engineering: with examples from the areas of Knowledge Management, e-Commerce and the Semantic Web” Springer, 2010</td></tr>
<tr><td>2</td><td colspan="9">Grigorous Antoniou and Van Hermelen - “A Semantic Web Primer”-The MITPress –2004</td></tr>
<tr><td colspan="10">Reference(s) :</td></tr>
<tr><td>1</td><td colspan="9">Alexander Maedche, “Ontology Learning for the Semantic Web”, Springer; 1 edition, 2002</td></tr>
<tr><td>2</td><td colspan="9">John Davies, Dieter Fensel, Frank Van Harmelen, “Towards the Semantic Web: Ontology – Driven Knowledge Management”, John Wiley & Sons Ltd., 2003.</td></tr>
<tr><td>3</td><td colspan="9">John Davies (Editor), Rudi Studer (Co-Editor), Paul Warren (Co-Editor) “Semantic Web Technologies: Trends and Research in Ontology-based Systems”Wiley Publications, Jul 2006</td></tr>
<tr><td>4</td><td colspan="9">Steffen Staab (Editor), Rudi Studer, “Handbook on Ontologies (International Handbooks on Information Systems)”, Springer 1st edition, 2004</td></tr>
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<tr><td>L</td><td>T</td><td>P</td><td>C</td><td>CA</td><td>ES</td><td>Total</td></tr>
<tr><td>10 PIT E12</td><td colspan="2">BIOINFORMATICS</td><td>3</td><td>0</td><td>0</td><td>3</td><td>50</td><td>50</td><td>100</td></tr>
<tr><td>Objective(s)</td><td colspan="8">To know the Central Dogma, to study database and networks, to understand data visualization, to study data mining and pattern matching.</td></tr>
<tr><td>1</td><td colspan="5">INTRODUCTION</td><td colspan="2">Total Hrs</td><td>9</td></tr>
<tr><td colspan="9">The Central Dogma – Killer Application – Parallel Universes – Watson’s Definition – Top Down Vs Bottom Up Approach – Information Flow – Conversance – Communications.</td></tr>
<tr><td>2</td><td colspan="5">DATABASE AND NETWORKS</td><td colspan="2">Total Hrs</td><td>9</td></tr>
<tr><td colspan="9">Definition – Data Management – Data Life Cycle – Database Technology – Interfaces – Implementation – Networks: Communication Models – Transmission Technology – Protocols – Bandwidth – Topology – Contents – Security – Ownership – Implementation.</td></tr>
<tr><td>3</td><td colspan="5">SEARCH ENGINES AND DATA VISUALIZATION</td><td colspan="2">Total Hrs</td><td>9</td></tr>
<tr><td colspan="9">Search Process – Technologies – Searching And Information Theory – Computational Methods – Knowledge Management – Sequence Visualizations – Structure Visualizations – User Interfaces – Animation Vs Simulation</td></tr>
<tr><td>4</td><td colspan="5">STATISTICS, DATA MINING AND PATTERN MATCHING</td><td colspan="2">Total Hrs</td><td>9</td></tr>
<tr><td colspan="9">Statistical Concepts – Micro Arrays – Imperfect Data – Basics – Quantifying – Randomness – Data Analysis – Tools Selection – Alignment – Clustering – Classification – Data Mining Methods – Technology – Infrastructure Pattern Recognition – Discovery – Machine Learning – Text Mining – Pattern Matching Fundamentals – Dot Matrix Analysis – Substitution Matrix – Dynamic Programming – Word Method – Bayesian Method – Multiple Sequence Alignment Tools.</td></tr>
<tr><td>5</td><td colspan="5">MODELING SIMULATION AND COLLABORATION</td><td colspan="2">Total Hrs</td><td>9</td></tr>
<tr><td colspan="9">Drug Discovery Fundamentals – Protein Structure – System Biology Tools – Collaboration And Communication – Standards – Issues – Case Study.</td></tr>
<tr><td colspan="7">Total hours to be taught</td><td colspan="2">45</td></tr>
<tr><td colspan="9">Reference(s) :</td></tr>
<tr><td>1</td><td colspan="8">Bryan Bergeron, “Bio Informatics Computing”, Prentice Hall, 2003.</td></tr>
<tr><td>2</td><td colspan="8">T.K. Affward, D.J. Parry Smith, “Introduction to Bio Informatics”, Pearson Education, 2001.</td></tr>
<tr><td>3</td><td colspan="8">Pierre Baldi, Soren Brunak, “Bio Informatics – The Machine Learning Approach”, 2nd Edition, First East West Press, 2003</td></tr>
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<tr><td colspan="8">K.S.Rangasamy College of Technology - Autonomous Regulation</td><td>R 2010</td></tr>
<tr><td colspan="2">Department</td><td colspan="2">Information Technology</td><td colspan="2">Programme Code & Name</td><td colspan="3">PIT : Information Technology</td></tr>
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<tr><td rowspan="2">Course Code</td><td rowspan="2" colspan="2">Course Name</td><td colspan="3">Hours / Week</td><td>Credit</td><td colspan="2">Maximum Marks</td><td></td></tr>
<tr><td>L</td><td>T</td><td>P</td><td>C</td><td>CA</td><td>ES</td><td>Total</td></tr>
<tr><td>10 PIT E13</td><td colspan="2">SOFT COMPUTING</td><td>3</td><td>0</td><td>0</td><td>3</td><td>50</td><td>50</td><td>100</td></tr>
<tr><td>Objective(s)</td><td colspan="8">To know the Neural Networks and Learning rules, to study feedback networks, to understand unsupervised learning networks, to learn genetic algorithms.</td></tr>
<tr><td>1</td><td colspan="5">FEED FORWARD NETWORKS AND SUPERVISED LEARNING</td><td colspan="2">Total Hrs</td><td>9</td></tr>
<tr><td colspan="9">Fundamentals – Biological Neural Network – Artificial neuron – Activation function – Learning rules – Perceptron Networks – Adaline – Madaline – Back propagation Networks – Learning factors – Linear Separability.</td></tr>
<tr><td>2</td><td colspan="5">SINGLE LAYER FEEDBACK NETWORKS</td><td colspan="2">Total Hrs</td><td>9</td></tr>
<tr><td colspan="9">Hopfield Network - Discrete Hopfield networks – Associative memories – Recurrent auto association memory – Bi-directional Associative memory – Temporal associative memory – Boltzman machine.</td></tr>
<tr><td>3</td><td colspan="5">UNSUPERVISED LEARNING NETWORKS</td><td colspan="2">Total Hrs</td><td>9</td></tr>
<tr><td colspan="9">Hamming networks – Self-Organizing feature maps – Adaptive Resonance Theory network – Instar – Outstar model – Counter propagation network–Radial basis function networks.</td></tr>
<tr><td>4</td><td colspan="5">FUZZY SETS AND RELATIONS and FUZZY TO CRISP CONVERSION</td><td colspan="2">Total Hrs</td><td>9</td></tr>
<tr><td colspan="9">Crisp set – Vagueness – Uncertainty and Imprecision – Fuzziness Basic definitions – Basic set theoretic operations for fuzzy sets – Types – Operations – Properties – Crisp versus fuzzy relation – Fuzzy relation – Cardinality operations, Properties – Fuzzy Cartesian product and composition – Non interactive fuzzy sets – Tolerance and Equivalence Relations – Fuzzy ordering relations – Fuzzy Morphism – Composition of fuzzy relations - Lambda cuts for fuzzy sets and relations – Definition – Methods</td></tr>
<tr><td>5</td><td colspan="5">APPLICATION OF NEURAL NETWORKS AND FUZZY LOGIC 5 and GENETIC ALGORITHMS 6</td><td colspan="2">Total Hrs</td><td>9</td></tr>
<tr><td colspan="9">Introduction – Terminologies – Genetic operators – Selection, Cross-over and mutation – fitness function – a simple genetic algorithm – Applications.</td></tr>
<tr><td colspan="8">Total hours to be taught</td><td>45</td></tr>
<tr><td colspan="9">Reference(s) :</td></tr>
<tr><td>1</td><td colspan="8">Simon Haykins, “Neural Networks: A Comprehensive Foundation” Pearson Education India / Prentice Hall of India, 2003.</td></tr>
<tr><td>2</td><td colspan="8">Laurene V.Fausett, “Fundamentals of Neural Networks: Architectures, Algorithms and Applications” Pearson Education India, 2004.</td></tr>
<tr><td>3</td><td colspan="8">Timothy J Ross, “Fuzzy Logic with Engineering Applications”, McGraw Hill International Edition, 2003.</td></tr>
<tr><td>4</td><td colspan="8">Zimmermann H.J., “Fuzzy Set Theory and its Applications”, Allied Publishers, 1996.</td></tr>
<tr><td>5</td><td colspan="8">David E.Goldberg, “Genetic Algorithms in Search, Optimization and Machine Learning”, Pearson Education Asia Pvt. Ltd., , 2000.</td></tr>
<tr><td>6</td><td colspan="8">Sivanandam S N, Sumathi S and Deepa S N, “ Neural Networks using MATLAB”, Tata McGraw Hill, 2005.</td></tr>
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K.S.Rangasamy College of Technology - Autonomous Regulation								R 2010
Department	Information Technology			Programme Code & Name			PIT : Information Technology	
Elective I								
Course Code	Course Name	Hours / Week			Credit	Maximum Marks		
		L	T	P	C	CA	ES	Total
10 PIT E14	EMBEDDED SYSTEMS	3	0	0	3	50	50	100
Objective(s)	To introduce students to the embedded systems, its hardware and software. To introduce devices and buses used for embedded networking. To explain programming concepts and embedded programming in C and C++.To explain real time operating systems, inter-task communication and an exemplary case of MUCOS – IIRTOS							
1	EMBEDDED COMPUTING				Total Hrs	9		
Challenges of Embedded Systems – Embedded system design process. Embedded processors – ARM processor – Architecture, ARM and Thumb Instruction sets								
2	EMBEDDED C PROGRAMMING				Total Hrs	9		
C-looping structures – Register allocation – Function calls – Pointer aliasing – structure arrangement – bit fields – unaligned data and endianness – inline functions and inline assembly – portability issues								
3	OPTIMIZING ASSEMBLY CODE				Total Hrs	9		
Profiling and cycle counting – instruction scheduling – Register allocation – conditional execution – looping constructs – bit manipulation – efficient switches – optimized primitives								
4	REAL TIME OPERATING SYSTEMS				Total Hrs	9		
Operating system services–Interrupt routines in RTOS environment–RTOS Task scheduling models –INTER PROCESS COMMUNICATION AND SYNCHRONISATION – Shared data problem – Use of Semaphore(s) – Priority Inversion Problem and Deadlock Situations – Inter Process Communications using Signals – Semaphore Flag or mutex as Resource key – Message Queues – Mailboxes – Pipes – Virtual (Logical) Sockets – Remote Procedure Calls (RPCs).								
5	EMBEDDED SYSTEM DEVELOPMENT				Total Hrs	9		
Study of Micro C/OS-II or Vx Works or Any other popular RTOS – RTOS System Level Functions – Task Service Functions – Time Delay Functions – Memory Allocation Related Functions – Semaphore Related Functions – Mailbox Related Functions – Queue Related Functions – Case Studies of Programming with RTOS – Understanding Case Definition – Multiple Tasks and their functions – Creating a list of tasks – Functions and IPCs – Exemplary Coding Steps– Hardware-software co-design in an embedded systems.								
Total hours to be taught						45		
Reference(s) :								
1	Andrew N Sloss, D. Symes, C. Wright, " ARM System Developers Guide", Morgan Kaufmann / Elsevier, 2006.							
2	Rajkamal, Embedded Systems Architecture, Programming and Design, TATA McGraw-Hill, First reprint Oct. 2003							
3	Michael J. Pont, "Embedded C", Pearson Education , 2007.							
4	Wayne Wolf, "Computers as Components : Principles of Embedded Computer System Design", Morgan Kaufmann / Elsevier, 2nd. edition, 2008.							
5	Steve Heath, "Embedded System Design" , Elsevier, 2nd. edition, 2003							

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<tr><td>10 PIT E15</td><td colspan="2">DATA WAREHOUSING AND DATA MINING</td><td>3</td><td>0</td><td>0</td><td>3</td><td>50</td><td>50</td><td>100</td></tr>
<tr><td>Objective(s)</td><td colspan="8">To understand the concepts of data mining functionalities, to learn the method for preparing data for mining, to understand clustering methods and technology behind Data Mining.</td></tr>
<tr><td>1</td><td colspan="5">INTRODUCTION</td><td colspan="2">Total Hrs</td><td>9</td></tr>
<tr><td colspan="9">Introduction: Motivation – Definition – Kinds of data – Data mining functionalities – Interestingness of patterns mined - Classification - Major issues Data Warehouse and OLAP Technology for Data Mining : A multidimensional data model - Data cubes – Schemas - Measures: their categorization and computation - OLAP operations in the multidimensional data model -Data warehouse architecture – Implementation - From data warehousing to data mining.</td></tr>
<tr><td>2</td><td colspan="5">DATA PREPARATION</td><td colspan="2">Total Hrs</td><td>9</td></tr>
<tr><td colspan="9">Data Preparation: Need for preprocessing the data - Data cleaning - Data integration and transformation - Data reduction - Discretization and concept hierarchy generation – Attribute Oriented Induction.</td></tr>
<tr><td>3</td><td colspan="5">MINING ASSOCIATION RULES IN LARGE DATABASES</td><td colspan="2">Total Hrs</td><td>9</td></tr>
<tr><td colspan="9">Mining Association Rules in Large Databases : Association rule mining - Mining single-dimensional Boolean association rules from transactional databases - Mining multilevel association rules from transaction databases - Mining multidimensional association rules from relational databases and data warehouses - Classification and Prediction: Definitions - Issues regarding classification and prediction - Classification by decision tree induction - Bayesian classification - Classification by back-propagation - Other classification methods – Prediction - Classifier accuracy.</td></tr>
<tr><td>4</td><td colspan="5">CLUSTER ANALYSIS</td><td colspan="2">Total Hrs</td><td>9</td></tr>
<tr><td colspan="9">Cluster Analysis: Definition - Types of data in clustering analysis – Categorization - Partitioning methods - Hierarchical methods - Density-based methods - Grid-based methods - Model-based clustering methods - Outlier analysis</td></tr>
<tr><td>5</td><td colspan="5">RECENT TRENDS</td><td colspan="2">Total Hrs</td><td>9</td></tr>
<tr><td colspan="9">Mining spatial databases - Mining multimedia databases - - Mining text databases - Mining the World-Wide Web- Data Mining Applications and Trends in Data Mining: Data mining applications - Data mining system products and research prototypes - Additional themes on data mining - Social impacts of data mining - Trends in data mining</td></tr>
<tr><td colspan="7">Total hours to be taught</td><td colspan="2">45</td></tr>
<tr><td colspan="9">Text book (s) :</td></tr>
<tr><td>1</td><td colspan="8">J. Han, M. Kamber, “Data Mining: Concepts and Techniques”, Harcourt India / Morgan Kauffman, 2007.</td></tr>
<tr><td colspan="9">Reference(s):</td></tr>
<tr><td>1</td><td colspan="8">Margaret H.Dunham, “Data Mining: Introductory and Advanced Topics”, Pearson Education 2004.</td></tr>
<tr><td>2</td><td colspan="8">Sam Anahory, Dennis Murry, “Data Warehousing in the real world”, Pearson Education 2003.</td></tr>
<tr><td>3</td><td colspan="8">David Hand, Heikki Manila, Padhraic Symth, “Principles of Data Mining”, PHI 2004.</td></tr>
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<tr><td>L</td><td>T</td><td>P</td><td>C</td><td>CA</td><td>ES</td><td>Total</td></tr>
<tr><td colspan="2">10 PIT E16</td><td colspan="2">DIGITAL IMAGE PROCESSING</td><td>3</td><td>0</td><td>0</td><td>3</td><td>50</td><td>50</td><td>100</td></tr>
<tr><td colspan="2">Objective(s)</td><td colspan="7">To study the image fundamentals and mathematical transforms necessary for image processing. To understand the various mathematical concepts applied to image enhancement. To learn the procedures for restoration of image. To deal with techniques performed for image compression. To become skilled at the image segmentation and representation techniques.</td></tr>
<tr><td>1</td><td colspan="4">DIGITAL IMAGE FUNDAMENTALS AND TRANSFORMS</td><td colspan="2">Total Hrs</td><td colspan="2">9</td></tr>
<tr><td colspan="9">Elements of visual perception – Image sampling and quantization – Basic relationship between pixels – Basic geometric transformations-Introduction to Fourier Transform and DFT – Separable Image Transforms -Walsh – Hadamard – Discrete Cosine Transform, Haar, Slant – Karhunen – Loeve transforms.</td></tr>
<tr><td>2</td><td colspan="4">IMAGE ENHANCEMENT TECHNIQUES</td><td colspan="2">Total Hrs</td><td colspan="2">9</td></tr>
<tr><td colspan="9">Spatial Domain methods: Basic grey level transformation – Histogram equalization – Image subtraction – Image averaging –Spatial filtering: Smoothing, sharpening filters – Laplacian filters – Frequency domain filters: Smoothing – Sharpening filters – Homomorphic filtering.</td></tr>
<tr><td>3</td><td colspan="4">IMAGE RESTORATION</td><td colspan="2">Total Hrs</td><td colspan="2">9</td></tr>
<tr><td colspan="9">Model of Image Degradation/restoration process – Noise models – Inverse filtering – Least mean square filtering – Constrained least mean square filtering –Geometric mean filter – Blind image restoration.</td></tr>
<tr><td>4</td><td colspan="4">IMAGE COMPRESSION</td><td colspan="2">Total Hrs</td><td colspan="2">9</td></tr>
<tr><td colspan="9">Fundamentals– Lossless compression: Variable length coding – LZW coding – Bit plane coding–Predictive coding–.Lossy Compression: Transform coding – Wavelet coding – Image compression standards: Binary Image–Compression standards– Continuous Tone Still Image Compression Standards–Video Compression standards.</td></tr>
<tr><td>5</td><td colspan="4">IMAGE SEGMENTATION AND REPRESENTATION</td><td colspan="2">Total Hrs</td><td colspan="2">9</td></tr>
<tr><td colspan="9">Edge detection – Thresholding - Region Based segmentation – Boundary representation: chain codes- Polygonal approximation – Boundary segments – Boundary descriptors: Simple descriptors –Fourier descriptors – Regional descriptors –Simple descriptors- Texture.</td></tr>
<tr><td colspan="7">Total hours to be taught</td><td colspan="2">45</td></tr>
<tr><td colspan="9">Text book :</td></tr>
<tr><td>1</td><td colspan="8">Rafael C Gonzalez and Richard E Woods, “Digital Image Processing”, third edition, Pearson Education, 2007.</td></tr>
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<tr><td>1</td><td colspan="8">William K Pratt,” Digital Image Processing”, John Wiley & Sons, New york, 2004.</td></tr>
<tr><td>2</td><td colspan="8">Anil K.Jain,”Fundamentals of Digital Image Processing”, Prentice Hall, Newdelhi, 1995.</td></tr>
<tr><td>3</td><td colspan="8">Chanda Dutta Magundar,” Digital Image Processing and Applications”, Prentice Hall of India, 2000.</td></tr>
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<tr><td colspan="2">10 PIT E17</td><td>ADVANCED COMPUTER ARCHITECTURE</td><td>3</td><td>0</td><td>0</td><td>3</td><td>50</td><td>50</td><td>100</td></tr>
<tr><td colspan="2">Objective(s)</td><td colspan="7">To study the ISA design, instruction pipelining and performance related issues, to do a detailed study of ILP with dynamic approaches, to do a detailed study of ILP with software approaches, to study the different multiprocessor architectures and related issues, to study the Memory and I/O systems and their performance issues.</td></tr>
<tr><td>1</td><td colspan="5">INTRODUCTION</td><td>Total Hrs</td><td colspan="2">9</td></tr>
<tr><td colspan="9">Fundamentals of Computer Design – Measuring and reporting performance – Quantitative principles of computer design. Instruction set principles – Classifying ISA – Design issues. Pipelining – Basic concepts – Hazards – Implementation – Multicycle operations.</td></tr>
<tr><td>2</td><td colspan="5">INSTRUCTION LEVEL PARALLELISM WITH DYNAMIC APPROACHES</td><td>Total Hrs</td><td colspan="2">9</td></tr>
<tr><td colspan="9">Concepts – Dynamic Scheduling – Dynamic hardware prediction – Multiple issue – Hardware based speculation – Limitations of ILP.</td></tr>
<tr><td>3</td><td colspan="5">INSTRUCTION LEVEL PARALLELISM WITH SOFTWARE APPROACHES</td><td>Total Hrs</td><td colspan="2">9</td></tr>
<tr><td colspan="9">Compiler techniques for exposing ILP – Static branch prediction – VLIW – Advanced compiler support – Hardware support for exposing more parallelism – Hardware versus software speculation mechanisms</td></tr>
<tr><td>4</td><td colspan="5">MEMORY AND I/O</td><td>Total Hrs</td><td colspan="2">9</td></tr>
<tr><td colspan="9">Cache performance – Reducing cache miss penalty and miss rate – Reducing hit time – Main memory and performance – Memory technology. Types of storage devices – Buses – RAID – Reliability, availability and dependability – I/O performance measures – Designing an I/O system.</td></tr>
<tr><td>5</td><td colspan="5">MULTIPROCESSORS AND THREAD LEVEL PARALLELISM</td><td>Total Hrs</td><td colspan="2">9</td></tr>
<tr><td colspan="9">Symmetric and distributed shared memory architectures – Performance issues – Synchronization – Models of memory consistency – Multithreading.</td></tr>
<tr><td colspan="7">Total hours to be taught</td><td colspan="2">45</td></tr>
<tr><td colspan="9">Reference(s) :</td></tr>
<tr><td>1</td><td colspan="8">1. John L. Hennessey and David A. Patterson,”Computer Architecture: A Quantitative Approach”, Morgan Kaufmann, 2003, Third Edition.</td></tr>
<tr><td>2</td><td colspan="8">D.Sima, T.Fountain and P.Kacsuk, ”Advanced Computer Architectures: A Design Space Approach”, Addison Wesley, 2000.</td></tr>
<tr><td>3</td><td colspan="8">Kai Hwang and Zhi.Wei Xu, “Scalable Parallel Computing”, Tata McGraw-Hill, New Delhi, 2003.</td></tr>
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<tr><td colspan="10">Elective II</td></tr>
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<tr><td>L</td><td>T</td><td>P</td><td>C</td><td>CA</td><td>ES</td><td>Total</td></tr>
<tr><td colspan="2">10 PIT E21</td><td colspan="2">CLOUD COMPUTING</td><td>3</td><td>0</td><td>0</td><td>3</td><td>50</td><td>50</td><td>100</td></tr>
<tr><td colspan="2">Objective(s)</td><td colspan="8">To emphasize virtualized data centers and cloud systems for understanding, research.</td></tr>
<tr><td>1</td><td colspan="5">DISTRIBUTED SYSTEM MODELS AND ENABLING TECHNOLOGIES</td><td colspan="2">Total Hrs</td><td colspan="2">9</td></tr>
<tr><td colspan="10">Scalable Computing over the Internet - Technologies for Network-Based Systems - System Models for Distributed and Cloud Computing - Software Environments for Distributed Systems and Clouds - Performance, Security, and Energy Efficiency</td></tr>
<tr><td>2</td><td colspan="5">VIRTUAL MACHINES AND VIRTUALIZATION OF CLUSTERS AND DATA CENTERS</td><td colspan="2">Total Hrs</td><td colspan="2">9</td></tr>
<tr><td colspan="10">Implementation Levels of Virtualization - Virtualization Structures/Tools and Mechanisms - Virtualization of CPU, Memory, and I/O Devices - Virtual Clusters and Resource Management - Virtualization for Data Center Automation</td></tr>
<tr><td>3</td><td colspan="5">CLOUD PLATFORM ARCHITECTURE OVER VIRTUALIZED DATA CENTERS</td><td colspan="2">Total Hrs</td><td colspan="2">9</td></tr>
<tr><td colspan="10">Cloud Computing and Service Models - Data-Center Design and Interconnection Networks - Architectural Design of Compute and Storage Clouds - Public Cloud platforms: GAE,AWS, and Azure - Inter-Cloud Resource Management - Cloud Security and Trust Management</td></tr>
<tr><td>4</td><td colspan="5">CLOUD PROGRAMMING AND SOFTWARE ENVIRONMENTS</td><td colspan="2">Total Hrs</td><td colspan="2">9</td></tr>
<tr><td colspan="10">Features of Cloud and Grid Platforms - Parallel and Distributed Programming Paradigms - Programming Support of Google APP Engine - Programming on Amazon AWS and Microsoft Azure - Emerging Cloud Software Environments</td></tr>
<tr><td>5</td><td colspan="5">UBIQUITOUS CLOUDS AND THE INTERNET OF THINGS</td><td colspan="2">Total Hrs</td><td colspan="2">9</td></tr>
<tr><td colspan="10">Cloud Trends in Supporting Ubiquitous Computing - Performance of Distributed systems and the Cloud - Case Study: Azure, SalesForce.com AWS, Google App Engine</td></tr>
<tr><td colspan="8">Total hours to be taught</td><td colspan="2">45</td></tr>
<tr><td colspan="10">Text book:</td></tr>
<tr><td>1</td><td colspan="9">Kai Hwang, Geoffrey C Fox, Jack J.Dongarra, “Distributed and Cloud Computing – From Parallel Processing to the Internet of Things ”,Morgan Kaufmann 2012.</td></tr>
<tr><td colspan="10">Reference(s) :</td></tr>
<tr><td>1</td><td colspan="9">Dan Sanderson, “Programming Google App Engine Build and Run Scalable Web Apps on Google’s Infrastructure “, O’Reilly, 2009.</td></tr>
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K.S.Rangasamy College of Technology Autonomous Regulation								R2010
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Elective II								
Course Code	Course Name	Hours/Week			Credit	Maximum Marks		
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10 PIT E22	VIRTUALIZATION TECHNIQUES	3	0	0	3	50	50	100
Objective(s)	To study about virtualization, storage and machine products.							

1	OVERVIEW OF VIRTUALIZATION	Total Hrs	9
Basics of Virtualization - Virtualization Types – Desktop Virtualization – Network Virtualization – Server and Machine Virtualization – Storage Virtualization – System-level or Operating Virtualization – Application Virtualization-Virtualization Advantages - Virtual Machine Basics – Taxonomy of Virtual machines - Process Virtual Machines - System Virtual Machines – Hypervisor - Key Concepts			
2	SERVER CONSOLIDATION	Total Hrs	9
Hardware Virtualization – Virtual Hardware Overview - Sever Virtualization – Physical and Logical Partitioning - Types of Server Virtualization – Business cases for Sever Virtualization – Uses of Virtual server Consolidation – Planning for Development – Selecting server Virtualization Platform			
3	NETWORK VIRTUALIZATION	Total Hrs	9
Design of Scalable Enterprise Networks - Virtualizing the Campus WAN Design - WAN Architecture - WAN Virtualization - Virtual Enterprise Transport Virtualization–VLANs and Scalability - Theory Network Device Virtualization Layer 2 - VLANs Layer 3 VRF Instances Layer 2 - VFIs Virtual Firewall Contexts Network Device Virtualization - Data-Path Virtualization Layer 2: 802.1q - Trunking Generic Routing Encapsulation - IPsec L2TPv3 Label Switched Paths - Control-Plane Virtualization–Routing Protocols- VRF - Aware Routing Multi-Topology Routing.			
4	VIRTUALIZING STORAGE	Total Hrs	9
SCSI- Speaking SCSI- Using SCSI buses – Fiber Channel – Fiber Channel Cables – Fiber Channel Hardware Devices –SCSI Architecture – Securing SCSI – SAN backup and recovery techniques – RAID – SNIA Shared Storage Model – Classical Storage Model – SNIA Shared Storage Model – Host based Architecture – Storage based architecture – Network based Architecture – Fault tolerance to SAN – Performing Backups – Virtual tape libraries.			
5	VIRTUAL MACHINES PRODUCTS	Total Hrs	9
Xen Virtual machine monitors- Xen API – VMware – VMware products - Vmware Features – Microsoft Virtual Server – Features of Microsoft Virtual Server			
Total hours to be taught			45

Reference(s):

1	William von Hagen, Professional Xen Virtualization, Wrox Publications, January, 2008
2	Chris Wolf , Erick M. Halter, Virtualization: From the Desktop to the Enterprise, APress 2005.
3	Kumar Reddy, Victor Moreno, Network virtualization, Cisco Press, July, 2006.
4	James E. Smith, Ravi Nair, Virtual Machines: Versatile Platforms for Systems and Processes, Elsevier/Morgan Kaufmann, 2005.
5	David Marshall, Wade A. Reynolds, Advanced Server Virtualization: VMware and Microsoft Platform in the Virtual Data Center, Auerbach Publications, 2006.

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<tr><td>L</td><td>T</td><td>P</td><td>C</td><td>CA</td><td>ES</td><td>Total</td></tr>
<tr><td>10 PIT E23</td><td colspan="2">SERVICE ORIENTED ARCHITECTURE</td><td>3</td><td>0</td><td>0</td><td>3</td><td>50</td><td>50</td><td>100</td></tr>
<tr><td>Objective(s)</td><td colspan="8">This subject tells about evolution, key components, architecture, analysis, design of SOA.
This subject tells about how to design web pages and how to provide security in web services.</td></tr>
<tr><td>1</td><td colspan="5">INTRODUCTION</td><td colspan="2">Total Hrs</td><td>9</td></tr>
<tr><td colspan="9">Software Architecture – Types of IT Architecture – SOA – Evolution – Key components – perspective of SOA – Enterprise-wide SOA – Architecture – Enterprise Applications – Solution Architecture for enterprise application – Software platforms for enterprise Applications – Patterns for SOA – SOA programming models</td></tr>
<tr><td>2</td><td colspan="5">SERVICE-ORIENTED ANALYSIS AND DESIGN</td><td colspan="2">Total Hrs</td><td>9</td></tr>
<tr><td colspan="9">Service-oriented Analysis and Design – Design of Activity, Data, Client and business process services – Technologies of SOA – SOAP – WSDL – JAX – WS – XML WS for .NET – Service integration with ESB – Scenario – Business case for SOA – stakeholder objectives – benefits of SPA – Cost Savings</td></tr>
<tr><td>3</td><td colspan="5">SOA IMPLEMENTATION AND GOVERNANCE</td><td colspan="2">Total Hrs</td><td>9</td></tr>
<tr><td colspan="9">SOA implementation and Governance – strategy – SOA development – SOA governance – trends in SOA – event-driven architecture – software s a service – SOA technologies – proof-of-concept – process orchestration – SOA best practices</td></tr>
<tr><td>4</td><td colspan="5">SECURITY AND DATA MANAGEMENT</td><td colspan="2">Total Hrs</td><td>9</td></tr>
<tr><td colspan="9">Meta data management – XML security – XML signature – XML Encryption – SAML – XACML – XKMS – WS-Security – Security in web service framework - advanced messaging</td></tr>
<tr><td>5</td><td colspan="5">TRANSACTION PROCESSING</td><td colspan="2">Total Hrs</td><td>9</td></tr>
<tr><td colspan="9">Transaction processing – paradigm – protocols and coodination – transaction specifications – SOA in mobile – research issues</td></tr>
<tr><td colspan="7">Total hours to be taught</td><td colspan="2">45</td></tr>
<tr><td colspan="9">Reference(s):</td></tr>
<tr><td>1</td><td colspan="8">Shankar Kambhampaly, “Service –Oriented Architecture for Enterprise Applications”, Wiley India Pvt Ltd, 2008</td></tr>
<tr><td>2</td><td colspan="8">Eric Newcomer, Greg Lomow, “Understanding SOA with Web Services”, Pearson Education</td></tr>
<tr><td>3</td><td colspan="8">Mark O’ Neill, et al. , “Web Services Security”, Tata McGraw-Hill Edition, 2003</td></tr>
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K.S.Rangasamy College of Technology - Autonomous Regulation								R 2010
Department	Information Technology	Programme Code & Name				PIT : Information Technology		
Elective II								
Course Code	Course Name	Hours / Week			Credit	Maximum Marks		
		L	T	P	C	CA	ES	Total
10 PIT E24	INFORMATION RETRIEVAL TECHNIQUES	3	0	0	3	50	50	100
Objective(s)	To study the Basic retrieval techniques of information ; to study dynamic approaches for retrieval; to study the clustering and pattern matching methods; to study web search techniques catering retrieval process							
1	INTRODUCTION				Total Hrs	9		
Basic Concepts – Retrieval Process – Modeling – Classic Information Retrieval- Algebraic and Probabilistic Models – Retrieval Performance Evaluation								
2	QUERY LANGUAGES AND OPERATIONS				Total Hrs	9		
Languages – Key Word based Querying – Pattern Matching – Structural Queries – Query Operations – User Relevance Feedback – Local and Global Analysis – Text and Multimedia languages								
3	TEXT OPERATIONS,INDEXING AND SEARCHING				Total Hrs	9		
Document Preprocessing – Clustering – Text Compression - Indexing and Searching – Inverted files – Boolean Queries – Sequential searching – Pattern matching – User Interface and Visualization – Human Computer Interaction								
4	MULTIMEDIA MODELS, INDEXING AND SEARCHING				Total Hrs	9		
Data Models – Query Languages – Spatial Access Methods – Generic Multimedia Indexing Approach – One Dimensional Time Series – Two Dimensional Color Images – Feature Extraction								
5	SEARCHING THE WEB AND LIBRARIES				Total Hrs	9		
Searching the Web – Challenges – Characterizing the Web – Search Engines – Browsing – Meta-searchers – Online IR systems –Digital Libraries – Architectural Issues – Document Models, Representations and Access								
Total hours to be taught						45		
Text book :								
1.	Ricardo Baeza-Yate, Berthier Ribeiro-Neto, “Modern Information Retrieval”, Pearson Education Asia, 2nd edition,2005.							
Reference(s) :								
1	G.G. Chowdhury, “Introduction to Modern Information Retrieval”, Neal-Schuman Publishers; 2nd edition, 2003.							
2	Daniel Jurafsky and James H. Martin, “Speech and Language Processing”, Pearson Education, 2000.							
3	David A. Grossman, Ophir Frieder, “Information Retrieval: Algorithms, and Heuristics”, Academic Press, 2000.							
4	Charles T. Meadow, Bert R. Boyce, Donald H. Kraft, “Text Information Retrieval Systems”, Academic Press, 2000.							

<table>
<tr><td colspan="8">K.S.Rangasamy College of Technology - Autonomous Regulation</td><td>R 2010</td></tr>
<tr><td colspan="2">Department</td><td colspan="2">Information Technology</td><td colspan="3">Programme Code & Name</td><td colspan="2">PIT : Information Technology</td></tr>
<tr><td colspan="9">Elective II</td></tr>
<tr><td rowspan="2" colspan="2">Course Code</td><td rowspan="2" colspan="2">Course Name</td><td colspan="3">Hours / Week</td><td>Credit</td><td colspan="2">Maximum Marks</td></tr>
<tr><td>L</td><td>T</td><td>P</td><td>C</td><td>CA</td><td>ES</td><td>Total</td></tr>
<tr><td colspan="2">10 PIT E25</td><td colspan="2">MOBILE AND PERVASIVE COMPUTING</td><td>3</td><td>0</td><td>0</td><td>3</td><td>50</td><td>50</td><td>100</td></tr>
<tr><td colspan="2">Objective(s)</td><td colspan="7">To study the emerging technology in mobile adaptive computing. It also explains about the protocols and context aware mobile services and pervasive computing.</td></tr>
<tr><td>1</td><td colspan="5">INTRODUCTION TO MOBILE ADAPTIVE COMPUTING</td><td colspan="2">Total Hrs</td><td>9</td></tr>
<tr><td colspan="8">Mobile Adaptive Computing – Mobile computing – Adaptability – Mechanisms for adaptation – How to develop or incorporate adaptations in applications- Support for building adaptive mobile applications- Mobility Management- location management principles and techniques- Location management case studies.</td></tr>
<tr><td>2</td><td colspan="5">MIDDLEWARE TECHNOLOGY</td><td colspan="2">Total Hrs</td><td>9</td></tr>
<tr><td colspan="8">Introduction to mobile middleware – Middleware for application development: adaptation – mobile agents. Service discovery middleware: Finding needed services – common ground- services – more on discovery and advertisement protocols – garbage collection – eventing – security – interoperability.</td></tr>
<tr><td>3</td><td colspan="5">INTRODUCTION TO PERVASIVE COMPUTING</td><td colspan="2">Total Hrs</td><td>9</td></tr>
<tr><td colspan="8">Technologies- Past, present, future- Application examples- Device technology- Device connectivity.</td></tr>
<tr><td>4</td><td colspan="5">WEB APPLICATION CONCEPTS</td><td colspan="2">Total Hrs</td><td>9</td></tr>
<tr><td colspan="8">Web application concepts- Voice technology- Personal digital assistants.</td></tr>
<tr><td>5</td><td colspan="5">ARCHITECTURES</td><td colspan="2">Total Hrs</td><td>9</td></tr>
<tr><td colspan="8">Server side programming in java – pervasive web application architecture – Example application.</td></tr>
<tr><td colspan="7">Total hours to be taught</td><td>45</td></tr>
<tr><td colspan="8">Reference(s) :</td></tr>
<tr><td>1</td><td colspan="7">Frank Adelstein, Sandeep K.S.Gupta, Golden G. Richard III, Loren Schwiebert, “Fundamentals of Mobile and Pervasive Computing” Tata McGraw Hill 2009.</td></tr>
<tr><td>2</td><td colspan="7">Jochen Burkhardt, Dr. Horst Henn, Stefan Hepper, Klaus Rintdorff, Thomas Schack, “Pervasive Computing Technology and Architecture of Mobile Internet Applications” Pearson Education 2009.</td></tr>
<tr><td>3</td><td colspan="7">Seng Loke, Context-Aware Computing Pervasive Systems, Auerbach Pub., New York, 2007</td></tr>
<tr><td>4</td><td colspan="7">Uwe Hansmann etl , Pervasive Computing, Springer, New York,2001.</td></tr>
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<tr><td>10 PIT E26</td><td colspan="2">COMPILER DESIGN</td><td>3</td><td>0</td><td>0</td><td>3</td><td>50</td><td>50</td><td>100</td></tr>
<tr><td>Objective(s)</td><td colspan="8">To understand, design and implement a lexical analyzer, understand, design and implement a parser, understand optimization of codes and runtime environment.</td></tr>
<tr><td>1</td><td colspan="4">INTRODUCTION TO COMPILERS</td><td colspan="2">Total Hrs</td><td colspan="2">9</td></tr>
<tr><td colspan="9">Compilers – Analysis of the source program – Phases of a compiler – Cousins of the Compiler – Grouping of Phases – Compiler construction tools - Lexical Analysis - Role of Lexical Analyzer – Input Buffering – Specification of Tokens.</td></tr>
<tr><td>2</td><td colspan="4">SYNTAX ANALYSIS</td><td colspan="2">Total Hrs</td><td colspan="2">9</td></tr>
<tr><td colspan="9">Role of the parser –Writing Grammars –Context-Free Grammars – Top Down parsing - Recursive Descent Parsing - Predictive Parsing – Bottom-up parsing - Shift Reduce Parsing – Operator Precedent Parsing - LR Parsers - SLR Parser - Canonical LR Parser - LALR Parser.</td></tr>
<tr><td>3</td><td colspan="4">INTERMEDIATE CODE GENERATION</td><td colspan="2">Total Hrs</td><td colspan="2">9</td></tr>
<tr><td colspan="9">Intermediate languages – Declarations – Assignment Statements – Boolean Expressions – Case Statements – Back patching – Procedure calls.</td></tr>
<tr><td>4</td><td colspan="4">CODE GENERATION</td><td colspan="2">Total Hrs</td><td colspan="2">9</td></tr>
<tr><td colspan="9">Issues in the design of code generator – The target machine – Runtime Storage management – Basic Blocks and Flow Graphs – Next-use Information – A simple Code generator – DAG representation of Basic Blocks – Peephole Optimization.</td></tr>
<tr><td>5</td><td colspan="4">CODE OPTIMIZATION AND RUN TIME ENVIRONMENTS</td><td colspan="2">Total Hrs</td><td colspan="2">9</td></tr>
<tr><td colspan="9">Introduction– Principal Sources of Optimization – Optimization of basic Blocks – Introduction to Global Data Flow Analysis – Runtime Environments – Source Language issues – Storage Organization – Storage Allocation strategies – Access to non-local names – Parameter Passing.</td></tr>
<tr><td colspan="7">Total hours to be taught</td><td colspan="2">45</td></tr>
<tr><td colspan="9">Text book :</td></tr>
<tr><td>1</td><td colspan="8">Alfred Aho, Ravi Sethi, Jeffrey D Ullman, “Compilers Principles, Techniques and Tools”, Pearson Education Asia, 2003.</td></tr>
<tr><td colspan="9">Reference (s) :</td></tr>
<tr><td>1</td><td colspan="8">Allen I. Holub “Compiler Design in C”, Prentice Hall of India, 2003.</td></tr>
<tr><td>2</td><td colspan="8">C. N. Fischer and R. J. LeBlanc, “Crafting a compiler with C”, Benjamin Cummings, 2003.</td></tr>
<tr><td>3</td><td colspan="8">J.P. Bennet, “Introduction to Compiler Techniques”, Second Edition, Tata McGraw-Hill, 2003.</td></tr>
<tr><td>4</td><td colspan="8">Henk Alblas and Albert Nymeyer, “Practice and Principles of Compiler Building with C”, PHI, 2001.</td></tr>
<tr><td>5</td><td colspan="8">Kenneth C. Louden, “Compiler Construction: Principles and Practice”, Thompson Learning, 2003.</td></tr>
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<tr><td colspan="2">10 PIT E27</td><td>GRID COMPUTING</td><td>3</td><td>0</td><td>0</td><td>3</td><td>50</td><td>50</td><td>100</td></tr>
<tr><td colspan="2">Objective(s)</td><td colspan="7">To understand the concept of grid computing. To know the application of grid computing. To understanding the technology and tool kits to facilitated the grid computing.</td></tr>
<tr><td>1</td><td colspan="5">GRID COMPUTING</td><td colspan="2">Total Hrs</td><td>9</td></tr>
<tr><td colspan="9">Introduction - Definition - Scope of grid computing</td></tr>
<tr><td>2</td><td colspan="5">GRID COMPUTING INITIATIVES</td><td colspan="2">Total Hrs</td><td>9</td></tr>
<tr><td colspan="9">Grid Computing Organizations and their roles – Grid Computing anatomy – Grid Computing road map.</td></tr>
<tr><td>3</td><td colspan="5">GRID COMPUTING APPLICATIONS</td><td colspan="2">Total Hrs</td><td>9</td></tr>
<tr><td colspan="9">Merging the Grid sources – Architecture with the Web Devices Architecture.</td></tr>
<tr><td>4</td><td colspan="5">TECHNOLOGIES</td><td colspan="2">Total Hrs</td><td>9</td></tr>
<tr><td colspan="9">OGSA – Sample use cases – OGSA platform components – OGSI – Introduction, Grid Services , A high-level Introduction to OGSI , Technical details of OGSI Specification –OGSA Basic Services</td></tr>
<tr><td>5</td><td colspan="5">GRID COMPUTING TOOL KITS</td><td colspan="2">Total Hrs</td><td>9</td></tr>
<tr><td colspan="9">Globus Toolkit – Architecture, Programming model, High level services</td></tr>
<tr><td colspan="8">Total hours to be taught</td><td>45</td></tr>
<tr><td colspan="9">Text book :</td></tr>
<tr><td>1</td><td colspan="8">Joshy Joseph & Craig Fellenstein, “Grid Computing”, PHI, PTR-2003.</td></tr>
<tr><td colspan="9">Reference (s) :</td></tr>
<tr><td>1</td><td colspan="8">Ahmar Abbas, “Grid Computing: A Practical Guide to technology and Applications”, Charles River media – 2003.</td></tr>
<tr><td>2</td><td colspan="8">D.Janakiram, ”Grid Computing”: A Research Monograph, Tata McGraw-Hill,2005</td></tr>
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<tr><td colspan="9">Elective III</td></tr>
<tr><td rowspan="2" colspan="2">Course Code</td><td rowspan="2">Course Name</td><td colspan="3">Hours / Week</td><td>Credit</td><td colspan="2">Maximum Marks</td><td></td></tr>
<tr><td>L</td><td>T</td><td>P</td><td>C</td><td>CA</td><td>ES</td><td>Total</td></tr>
<tr><td colspan="2">10 PIT E31</td><td>ADHOC AND SENSOR NETWORKS</td><td>3</td><td>0</td><td>0</td><td>3</td><td>50</td><td>50</td><td>100</td></tr>
<tr><td colspan="2">Objective(s)</td><td colspan="7">To Understand the Concept of Ad-Hoc wireless Network. To know the Ad-Hoc Network Routing & TCP. To understand the concepts of wireless sensor Networks.</td></tr>
<tr><td>1</td><td colspan="5">AD-HOC MAC</td><td colspan="2">Total Hrs</td><td>9</td></tr>
<tr><td colspan="9">Introduction – Issues in Ad-Hoc wireless Networks. MAC Protocols – Issues, Ckassification of MAC protocols, Multi channel MAC & Power control MAC protocol</td></tr>
<tr><td>2</td><td colspan="5">AD-HOC NETWORK ROUTING & TCP</td><td colspan="2">Total Hrs</td><td>9</td></tr>
<tr><td colspan="9">Issues – classification of routing protocols – Hierarchical and power aware. Multicast routing – Classifications, Tree based, Mesh based, Ad Hoc Transport layer issues. TCP over Ad Hoc – Feedback based, TCP with explicit link, TCP-Bus, Ad Hoc TCP, and Split TCP.</td></tr>
<tr><td>3</td><td colspan="5">WSN – MAC</td><td colspan="2">Total Hrs</td><td>9</td></tr>
<tr><td colspan="9">Introduction – Sensor Network Architecture, Data dissemination, Gathering. MAC Protocols – self-organizing, Hybrid TDMA/FDMA and CSMA based MAC</td></tr>
<tr><td>4</td><td colspan="5">OVERVIEW OF WIRELESS SENSOR NETWORKS</td><td colspan="2">Total Hrs</td><td>9</td></tr>
<tr><td colspan="9">Challenges for wireless sensor Networks – Characteristics requirements – required mechanisms, Differnce between mobile ad-hoc and sensor networks, Applications of sensor networks – Enabling Technologies for wireless sensor Networks.</td></tr>
<tr><td>5</td><td colspan="5">ARCHITECTURES</td><td colspan="2">Total Hrs</td><td>9</td></tr>
<tr><td colspan="9">Single- Node Architecture – hardware Components, Energy consumption of Sensor Nodes, Operating Systems and Execution Environments, Network Architecture – sensor Network Scenarios, Optimization Goals and Figures of Merit, Gateway Concepts</td></tr>
<tr><td colspan="7">Total hours to be taught</td><td colspan="2">45</td></tr>
<tr><td colspan="9">Text book :</td></tr>
<tr><td>1</td><td colspan="8">C.Siva Ram Murthy and B.Smanoj, “Ad Hoc Wireless Networks – Architectures and Protocols”, Pearson education,2004.</td></tr>
<tr><td>2</td><td colspan="8">Holger Karl &Andreas Willig, “ Protocols and Architectures for Wireless sensor Networks”, John Wiley, 2005</td></tr>
<tr><td colspan="9">Reference (s) :</td></tr>
<tr><td>1</td><td colspan="8">feng Zhao & Leonidas J.Guibas, “wireless Sensor Networks – An Information Processing Approach”,Elsevier, 2007</td></tr>
<tr><td>2</td><td colspan="8">C.K. Toh, “Ad hoc Mobile Wireless Networks”, Pearson Education, 2002</td></tr>
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<tr><td>L</td><td>T</td><td>P</td><td>C</td><td>CA</td><td>ES</td><td>Total</td></tr>
<tr><td colspan="2">10 PIT E32</td><td>ENTERPRISE RESOURCE PLANNING</td><td>3</td><td>0</td><td>0</td><td>3</td><td>50</td><td>50</td><td>100</td></tr>
<tr><td colspan="2">Objective(s)</td><td colspan="7">To know the basics of ERP, understand the key implementation issues, to know the business modules, to be aware of some popular and appreciate the current and future trends in ERP.</td></tr>
<tr><td>1</td><td colspan="5">INTRODUCTION</td><td colspan="2">Total Hrs</td><td>9</td></tr>
<tr><td colspan="9">ERP: An Overview, Enterprise – An Overview, Benefits of ERP, ERP and Related Technologies, Business Process Reengineering (BPR), Data Warehousing, Data Mining, OLAP, SCM</td></tr>
<tr><td>2</td><td colspan="5">ERP IMPLEMENTATION</td><td colspan="2">Total Hrs</td><td>9</td></tr>
<tr><td colspan="9">ERP Implementation Lifecycle, Implementation Methodology, Hidden Costs, Organizing the Implementation, Vendors, Consultants and Users, Contracts with Vendors, Consultants and Employees, Project Management and Monitoring</td></tr>
<tr><td>3</td><td colspan="5">THE BUSINESS MODULES</td><td colspan="2">Total Hrs</td><td>9</td></tr>
<tr><td colspan="9">Business modules in an ERP Package, Finance, Manufacturing, Human Resources, Plant Maintenance, Materials Management, Quality Management, Sales and Distribution</td></tr>
<tr><td>4</td><td colspan="5">THE ERP MARKET</td><td colspan="2">Total Hrs</td><td>9</td></tr>
<tr><td colspan="9">ERP Market Place, SAP AG, Peoplesoft, Baan, JD Edwards, Oracle, QAD, SSA</td></tr>
<tr><td>5</td><td colspan="5">ERP – PRESENT AND FUTURE</td><td colspan="2">Total Hrs</td><td>9</td></tr>
<tr><td colspan="9">Turbo Charge the ERP System, EIA, ERP and e-Commerce, ERP and Internet, Future Directions</td></tr>
<tr><td colspan="8">Total hours to be taught</td><td>45</td></tr>
<tr><td colspan="9">Text book :</td></tr>
<tr><td>1</td><td colspan="8">Alexis Leon, “ERP Demystified”, Tata McGraw Hill, New Delhi, 2000</td></tr>
<tr><td colspan="9">Reference (s) :</td></tr>
<tr><td>1</td><td colspan="8">Joseph A Brady, Ellen F Monk, Bret Wagner, “Concepts in Enterprise Resource Planning”, Thompson Course Technology, USA, 2001</td></tr>
<tr><td>2</td><td colspan="8">Vinod Kumar Garg and Venkitakrishnan N K, “Enterprise Resource Planning – Concepts and Practice”, PHI, New Delhi, 2003</td></tr>
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<tr><td>10 PIT E33</td><td colspan="2">HUMAN RESOURCE MANAGEMENT</td><td>3</td><td>0</td><td>0</td><td>3</td><td>50</td><td>50</td><td>100</td></tr>
<tr><td>Objective(s)</td><td colspan="8">To know the basics of HRM, understand the training and development, evaluate performance and control process.</td></tr>
<tr><td>1</td><td colspan="4">PERSPECTIVES IN HUMAN RESOURCE MANAGEMENT</td><td colspan="2">Total Hrs</td><td colspan="2">9</td></tr>
<tr><td colspan="9">Evolution of human resource management – the importance of the human factor – objectives of human resource management – role of human resource manager – human resource policies – computer applications in human resource management.</td></tr>
<tr><td>2</td><td colspan="4">THE CONCEPT OF BEST FIT EMPLOYEE</td><td colspan="2">Total Hrs</td><td colspan="2">9</td></tr>
<tr><td colspan="9">Importance of human resource planning – forecasting human resource requirement – internal and external sources. Selection process-screening – tests - validation – interview - medical examination – recruitment introduction – importance – practices – socialization benefits.</td></tr>
<tr><td>3</td><td colspan="4">TRAINING AND EXECUTIVE DEVELOPMENT</td><td colspan="2">Total Hrs</td><td colspan="2">9</td></tr>
<tr><td colspan="9">Types of training, methods, purpose, benefits and resistance. Executive development programmes – common practices - benefits – self development – knowledge management.</td></tr>
<tr><td>4</td><td colspan="4">SUSTAINING EMPLOYEE INTEREST</td><td colspan="2">Total Hrs</td><td colspan="2">9</td></tr>
<tr><td colspan="9">Compensation plan – reward – motivation – theories of motivation – career management – development, mentor – protégé relationships.</td></tr>
<tr><td>5</td><td colspan="4">PERFORMANCE EVALUATION AND CONTROL PROCESS</td><td colspan="2">Total Hrs</td><td colspan="2">9</td></tr>
<tr><td colspan="9">Method of performance evaluation – feedback – industry practices. Promotion, demotion, transfer and separation – implication of job change. The control process – importance – methods – requirement of effective control systems grievances – causes – implications – redressal methods.</td></tr>
<tr><td colspan="7">Total hours to be taught</td><td colspan="2">45</td></tr>
<tr><td colspan="9">Text book :</td></tr>
<tr><td>1</td><td colspan="8">Decenzo and Robbins, Human Resource Management, Wilsey, 6th edition, 2001.</td></tr>
<tr><td>2</td><td colspan="8">Biswajeet Pattanayak, Human Resource Management, Prentice Hall of India,2001.</td></tr>
<tr><td colspan="9">Reference (s) :</td></tr>
<tr><td>1</td><td colspan="8">Human Resource Management, Eugence Mckenna and Nic Beach, Pearson Education Limited, 2002.</td></tr>
<tr><td>2</td><td colspan="8">Dessler Human Resource Management, Pearson Education Limited, 2002.</td></tr>
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<tr><td colspan="2">Department</td><td colspan="2">Information Technology</td><td colspan="2">Programme Code &Name</td><td colspan="3">PIT : Information Technology</td></tr>
<tr><td colspan="9">Elective III</td></tr>
<tr><td colspan="2" rowspan="2">Course Code</td><td rowspan="2">Course Name</td><td colspan="3">Hours / Week</td><td>Credit</td><td colspan="3">Maximum Marks</td></tr>
<tr><td>L</td><td>T</td><td>P</td><td>C</td><td>CA</td><td>ES</td><td>Total</td></tr>
<tr><td colspan="2">10 PIT E34</td><td>MULTICORE ARCHITECTURE</td><td>3</td><td>0</td><td>0</td><td>3</td><td>50</td><td>50</td><td>100</td></tr>
<tr><td colspan="2">Objective(s)</td><td colspan="7">To Understand the Concept of Multicore Architecture, To know the memory organization and Protocols, to understand the concepts of PowerPC Architecture.</td></tr>
<tr><td>1</td><td colspan="5">INTRODUCTION TO MULTICORE ARCHITECTURE</td><td colspan="2">Total Hrs</td><td>9</td></tr>
<tr><td colspan="8">Fundamentals of SuperScalar Processor Design, Introduction to Multicore Architecture – Chip Multiprocessing, homogeneous Vs heterogeneous design - SMP – Multicore Vs Multithreading.</td></tr>
<tr><td>2</td><td colspan="5">MEMORY ORGANIZATION</td><td colspan="2">Total Hrs</td><td>9</td></tr>
<tr><td colspan="8">Shared memory architectures– synchronization – Memory organization – Cache Memory – Cache Coherency Protocols - Design of Levels of Caches.</td></tr>
<tr><td>3</td><td colspan="5">PROGRAMMING MODEL</td><td colspan="2">Total Hrs</td><td>9</td></tr>
<tr><td colspan="8">Multicore programming Model – Shared memory model, message passing model, transaction model – OpenMP and MPI Programming.</td></tr>
<tr><td>4</td><td colspan="5">PowerPC ARCHITECTURE</td><td colspan="2">Total Hrs</td><td>9</td></tr>
<tr><td colspan="8">PowerPC architecture – RISC design, PowerPC ISA, PowerPC Memory Management Power 5 Multicore architecture design, Power 6 Architecture.</td></tr>
<tr><td>5</td><td colspan="5">ADVANCED CONCEPTS</td><td colspan="2">Total Hrs</td><td>9</td></tr>
<tr><td colspan="8">Cell Broad band engine architecture, PPE (Power Processor Element), SPE (Synergistic processing element), Cell Software Development Kit, Programming for Multicore architecture.</td></tr>
<tr><td colspan="7">Total hours to be taught</td><td>45</td></tr>
<tr><td colspan="8">Text book :</td></tr>
<tr><td>1</td><td colspan="7">Hennessey & Pateterson, “Computer Architecture A Quantitative Approach”, Harcourt Asia, Morgan Kaufmann, 1999</td></tr>
<tr><td>2</td><td colspan="7">Joseph JaJa, Introduction to Parallel Algorithms, Addison-Wesley, 1992.</td></tr>
<tr><td>3</td><td colspan="7">IBM Journals for Power 5, Power 6 and Cell Broadband engine architecture.</td></tr>
<tr><td colspan="8">Reference (s) :</td></tr>
<tr><td>1</td><td colspan="7">Kai Hwang, “Advanced Computer Architecture: Parallelism, Scalability and Programmability” McGraw-Hill, 1993</td></tr>
<tr><td>2</td><td colspan="7">Richard Y. Kain, “Advanced Computer Architecture: A System Design Approach”, PHI, 1999</td></tr>
<tr><td>3</td><td colspan="7">Rohit Chandra, Ramesh Menon, Leo Dagum, and David Kohr, Parallel Programming in OpenMP, Morgan Kaufmann, 2000.</td></tr>
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K.S.Rangasamy College of Technology - Autonomous Regulation							R 2010		
Department	Information Technology		Programme Code & Name			PIT : Information Technology			
Elective III									
Course Code	Course Name	Hours / Week			Credit	Maximum Marks			
		L	T	P	C	CA	ES	Total	
10 PIT E35	NATURAL LANGUAGE PROCESSING	3	0	0	3	50	50	100	
Objective(s)	To study about Natural Language Processing, to learn about information retrieval architecture, to study about text mining.								

1	INTRODUCTION	Total Hrs	9
Natural Language Processing – Linguistic Background- Spoken language input and output Technologies – Written language Input - Mathematical Methods - Statistical Modeling and Classification Finite State methods Grammar for Natural Language Processing – Parsing – Semantic and Logic Form – Ambiguity Resolution – Semantic Interpretation			
2	INFORMATION RETRIEVAL	Total Hrs	9
Information Retrieval architecture - Indexing- Storage – Compression Techniques – Retrieval Approaches – Evaluation - Search engines- commercial search engine features- comparison- performance measures – Document Processing - NLP based Information Retrieval – Information Extraction			
3	TEXT MINING	Total Hrs	9
Categorization – Extraction based Categorization- Clustering- Hierarchical Clustering- Document Classification and routing- finding and organizing answers from Text search – use of categories and clusters for organizing retrieval results – Text Categorization and efficient Summarization using Lexical Chains – Pattern Extraction			
4	GENERIC ISSUES	Total Hrs	9
Multilingualism – Multilingual Information Retrieval and Speech processing - Multimodality – Text and Images – Modality Integration - Transmission and Storage – Speech coding- Evaluation of systems – Human Factors and user Acceptability			
5	APPLICATIONS	Total Hrs	9
Machine Translation – Transfer Metaphor - Interlingua and Statistical Approaches - Discourse Processing – Dialog and Conversational Agents – Natural Language Generation – Surface Realization and Discourse Planning			
Total hours to be taught			45
Reference(s) :			
1	Daniel Jurafsky and James H. martin, " Speech and Language Processing" , 2000		
2	Ron Cole, J.Mariani, et.al "Survey of the State of the Art in Human Language Technology", Cambridge University Press, 1997.		
3	Michael W. Berry " Survey of Text Mining: Clustering, Classification and Retrieval", Springer Verlag, 2003		
4	Christopher D.Manning and Hinrich Schutze, "Foundations of Statistical Natural Language Processing ", MIT Press, 1999.		

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<tr><td>10 PIT E36</td><td colspan="2">WEB DATA MINING</td><td>3</td><td>0</td><td>0</td><td>3</td><td>50</td><td>50</td><td>100</td></tr>
<tr><td>Objective(s)</td><td colspan="8">This subject introduces basic concepts, tasks, methods, and techniques in web mining. This subject will develop an understanding of the web mining process and issues, learn various techniques for data mining, and apply the techniques in solving data mining problems using data mining tools and systems.</td></tr>
<tr><td>1</td><td colspan="5">INTRODUCTION</td><td colspan="2">Total Hrs</td><td>9</td></tr>
<tr><td colspan="9">What is Data Mining - Relational Databases - Data Warehouses - Transactional Databases - Advanced Database Systems - Data Mining Functionalities - Interestingness of a pattern Classification of Data Mining Systems - Major issues in Data Mining</td></tr>
<tr><td>2</td><td colspan="5">DATA MINING AND KNOWLEDGE DISCOVERY</td><td colspan="2">Total Hrs</td><td>9</td></tr>
<tr><td colspan="9">The KDD process and methodology - Data preparation for knowledge discovery - Overview of data mining techniques - Market basket analysis - Classification and prediction – Clustering - Memory-based reasoning - Evaluation and Interpretation.</td></tr>
<tr><td>3</td><td colspan="5">WEB USAGE MINING PROCESS AND TECHNIQUES</td><td colspan="2">Total Hrs</td><td>9</td></tr>
<tr><td colspan="9">Data collection and sources of data- Data preparation for usage mining - Mining navigational patterns - Integrating e-commerce data - Leveraging site content and structure - User tracking and profiling - E-Metrics: measuring success in e-commerce Privacy issues.</td></tr>
<tr><td>4</td><td colspan="5">CLASSIFICATION AND PREDICTION</td><td colspan="2">Total Hrs</td><td>9</td></tr>
<tr><td colspan="9">Concepts and Issues regarding Classification and Prediction – Classification by Decision Tree Induction – Bayesian Classification - Classification by Back-propagation - Classification Based on Concepts from Association Rule Mining.</td></tr>
<tr><td>5</td><td colspan="5">WEB MINING APPLICATIONS AND OTHER TOPICS</td><td colspan="2">Total Hrs</td><td>9</td></tr>
<tr><td colspan="9">Data integration for e-commerce - Web personalization and recommender systems - Web content and structure mining - Web data warehousing - Review of tools, applications, and systems.</td></tr>
<tr><td colspan="8">Total hours to be taught</td><td>45</td></tr>
<tr><td colspan="9">Text book (s) :</td></tr>
<tr><td>1</td><td colspan="8">Data Mining Techniques for Marketing, Sales, and Customer Relationship Management, Second Edition, by Michael Berry and Gordon Linoff, John Wiley, 2004</td></tr>
<tr><td colspan="9">Reference(s):</td></tr>
<tr><td>1</td><td colspan="8">The Data Web house Toolkit, by Ralph Kimball and Richard Merz, John Wiley, 2000</td></tr>
<tr><td>2</td><td colspan="8">Mining the Web: Transforming Customer Data into Customer Value, by Gordon Linoff and Michael Berry, John Wiley & Sons, 2001.</td></tr>
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Elective III								
Course Code	Course Name	Hours/Week			Credit	Maximum Marks		
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10 PIT E37	XML AND WEB SERVICES	3	0	0	3	50	50	100
Objective(s)	The basic aim of this subject is to provide students with insight into XML Web Services, various key technologies for web services, protocol architecture of XML services and also explains how the web services can be developed using XML and also describes various security issues in the XML document.							
1	INTRODUCTION				Total Hrs	9		
Role Of XML – XML and the Web – XML Language Basics – SOAP – Web Services – Revolutions of Xml – Service Oriented Architecture (SOA).								
2	XML TECHNOLOGY				Total Hrs	9		
XML-Namespaces – Structuring With Schemas and DTD – Presentation Techniques – Transformation - XML Infrastructure.								
3	SOAP				Total Hrs	9		
Overview Of SOAP-HTTP – XML – RPC – SOAP: Protocol-Message Structure – Intermediaries – Actors – Design Patterns and Faults – SOAP with Attachments.								
4	WEB SERVICES				Total Hrs	9		
Overview – Architecture – Key Technologies – UDDI – WSDL – ebXML – SOAP and Web services in E-Com – Overview of .NET And J2EE.								
5	XML SECURITY AND XML INPRACTICE				Total Hrs	9		
Security Overview – Canonicalization – XML Security Frame Work – XML Encryption – XML Digital Signature – XKMS Structure – Guidelines for Signing XML Documents – XML in Practice.								
Total hours to be taught						45		
Text book (s) :								
1	Frank. P. Coyle, XML, Web Services And The Data Revolution, Pearson Education, 2002.							
Reference(s):								
1	Ramesh Nagappan, Robert Skoczylas and Rima Patel Sriganesh, “Developing Java Web Services”, Wiley Publishing Inc., 2004.							
2	Sandeep Chatterjee, James Webber, “Developing Enterprise Web Services”, Pearson Education, 2004.							
3	McGovern, et al., “Java Web Services Architecture”, Morgan Kaufmann Publishers, 2005.							

K.S.Rangasamy College of Technology - Autonomous Regulation								R 2010
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Elective IV								
Course Code	Course Name	Hours / Week			Credit	Maximum Marks		
		L	T	P	C	CA	ES	Total
10 PIT E41	SOFTWARE QUALITY MANAGEMENT	3	0	0	3	50	50	100
Objective(s)	To understand the Concept & Software Quality Management, understand the software process Assessment, understand the software configuration Management, understand the software standards, understand the software Testing Principles, Understand the Principles & detect Prevention in software.							
1	INTRODUCTION					Total Hrs		9
Software Process assessment overview – Assessment phases – assessment principles – Assessment conduct – Implementation consideration – Quality management – Quality assurance plan – Considerations – Verification and Validation.								
2	CONFIGURATION MANAGEMENT					Total Hrs		9
Need for configuration Management – Software product nomenclature – configuration management functions – Baselines – Responsibilities – Need for automated tools – plan – SCM support functions – The requirement phase Design control – The implementation phase – Test phase – SCM Tools – Configuration accounting and audit.								
3	SOFTWARE STANDARDS AND INSPECTION					Total Hrs		9
Definitions – Reason for software standards – Benefits – Establishing standards – Guidelines – Types of reviews – Inspection of objectives – Basic inspection principles – The conduct of inspection – Inspection training.								
4	TESTING AND MANAGEMENT SOFTWARE QUALITY					Total Hrs		9
Testing: principles – Types – Planning – Development – Execution and reporting – Tools and methods - Real Time testing – Quality management paradigm – Quality motivation – Measurement criteria – Establishing a software quality program – Estimating software quality.								
5	DEFECT PREVENTION					Total Hrs		9
Principles of software defect prevention – Process changes for defect prevention – Defect prevention consideration – Managements role – Framework for software process change – Managing resistance to software process change.								
Total hours to be taught								45
Text book :								
1	Watts S. Humphrey, Managing the software process, Addison Wesley, 1999.							
Reference (s) :								
1	Tsum S.Chow, Software Quality Assurance a Practical Approach, IEEE Computer Society press, 1985.							
2	Richard E. Fairley, Software Engineering – A Practitioner’s approach, McGraw Hill, 1982.							

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<tr><td>10 PIT E42</td><td>SOFTWARE TESTING METHODOLOGIES</td><td>3</td><td>0</td><td>0</td><td>3</td><td>50</td><td>50</td><td>100</td></tr>
<tr><td>Objective(s)</td><td colspan="7">To explain the basics of software testing. To study the different phases of software testing process. To incorporate specialized testing responsibilities.</td></tr>
<tr><td>1</td><td colspan="4">INTRODUCTION</td><td colspan="2">Total Hrs</td><td>9</td></tr>
<tr><td colspan="8">Assessing capabilities, staff competency and user satisfaction – creating an environment supportive of software testing – building the software testing process – selecting and installing software testing tools – building software tester competency.</td></tr>
<tr><td>2</td><td colspan="4">TESTING PROCESS - I</td><td colspan="2">Total Hrs</td><td>9</td></tr>
<tr><td colspan="8">Overview of software testing process – organizing for testing – developing the test plan – verification testing.</td></tr>
<tr><td>3</td><td colspan="4">TESTING PROCESS - II</td><td colspan="2">Total Hrs</td><td>9</td></tr>
<tr><td colspan="8">Validation testing – analyzing and reporting test results – acceptance and operational testing – post implementation analysis.</td></tr>
<tr><td>4</td><td colspan="4">SPECIALIZED TESTING – I</td><td colspan="2">Total Hrs</td><td>9</td></tr>
<tr><td colspan="8">Software development methodologies – testing client/server systems – rapid application development testing – testing internal controls – Testing COTS and contracted software.</td></tr>
<tr><td>5</td><td colspan="4">SPECIALIZED TESTING - II</td><td colspan="2">Total Hrs</td><td>9</td></tr>
<tr><td colspan="8">Testing in a multiplatform environment – testing software system security – testing a data warehouse – testing web-based systems.</td></tr>
<tr><td colspan="7">Total hours to be taught</td><td>45</td></tr>
<tr><td colspan="8">Text book (s) :</td></tr>
<tr><td>1</td><td colspan="7">William E.Perry, “Effective Methods for Software Testing”, Third Edition, Wiley India (P) Ltd., 2007.</td></tr>
<tr><td colspan="8">Reference(s):</td></tr>
<tr><td>1</td><td colspan="7">Boris Beizer, “Software Testing Techniques”, Second Edition, Dreamtech Press, 2009.</td></tr>
<tr><td>2</td><td colspan="7">Ilene Burnstein, “Practical Software Testing”, Springer International Edition, Chennai, 2003.</td></tr>
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<tr><td>10 PIT E43</td><td>OPEN SOURCE ARCHITECTURE</td><td>3</td><td>0</td><td>0</td><td>3</td><td>50</td><td>50</td><td>100</td></tr>
<tr><td>Objective(s)</td><td colspan="7">The main objective is to allow students to address issues and adapt Open Source Technologies and Practices</td></tr>
<tr><td>1</td><td colspan="4">OVERVIEW OF OPEN SOURCE SOFTWARE</td><td colspan="2">Total Hrs</td><td>9</td></tr>
<tr><td colspan="8">Overview of Open Source Software: The Open Source Definition, Examples of OSD-compliant licenses, Examples of Open Source Software Products, The Open Source Software Development Process, A history of Open Source Software: The Berkeley Software Distribution, TeX, The Free Software Foundation, Linux, Apache,Mozilla, Open Source Software Open Source: The Good, the Bad and the Ugly.</td></tr>
<tr><td>2</td><td colspan="4">OPEN SOURCE SOFTWARE QUALIFICATION AND TRANSFORMATION</td><td colspan="2">Total Hrs</td><td>9</td></tr>
<tr><td colspan="8">Qualification: Defining Open Source Software, Categorizing Defining Open Source Software, Specific Characteristics of Open Source Software, Transformation: The OSS development process, Taboos and norms in OSS development, The OSS development life cycle, Deriving a framework for analyzing OSS: Zachman's framework for IS architecture, CATWOE and Soft systems method, Deriving the analytical framework for OSS.</td></tr>
<tr><td>3</td><td colspan="4">OSS ENVIRONMENT</td><td colspan="2">Total Hrs</td><td>9</td></tr>
<tr><td colspan="8">Environment: The "where?" of OSS, the "when?" of OSS, World View: A framework for classifying OSS motivations, Technological micro-level and macro-level(individual) motivation, Economic micro-level and macro-level(individual) motivation, Socio-political micro-level and macro-level(individual) motivation.</td></tr>
<tr><td>4</td><td colspan="4">APPLICATION ARCHITECTURE AND HOW OPEN SOURCE SOFTWARE IS DEVELOPED</td><td colspan="2">Total Hrs</td><td>9</td></tr>
<tr><td colspan="8">Application Architecture: Types of Systems, Tiered Design, Managing Performance and scalability, Interoperability, Development Platform Choices, Open Source Software Development: Methodology, Languages Used to Develop Open Source Products, Cross-Platform Code, Managing System Implementation: Implementation Roles, Open Source Impact on Team Issues, Implementation Process, Implementation Principles, Key Documents, Migration, Interacting with the Open Source Community.</td></tr>
<tr><td>5</td><td colspan="4">OPEN SOURCE SERVER APPLICATIONS</td><td colspan="2">Total Hrs</td><td>9</td></tr>
<tr><td colspan="8">Open Source Server Applications: Infrastructure Services, Web Servers, Database Servers, Mail Servers, Systems Management, Open Source Desktop Applications: Introduction, Graphical desktops, Web Browsers, The Office Suite, Mail and Calendar Clients, Personal Software, Cost of OSS: Total cost of Ownership, Types of Costs Licensing: Types of Licenses, Licenses in Use, Mixing Open and Closed Code, Dual Licensing.</td></tr>
<tr><td colspan="7">Total hours to be taught</td><td>45</td></tr>
<tr><td colspan="8">Text book :</td></tr>
<tr><td>1</td><td colspan="7">Understanding Open Source Software Development by Joseph Feller, Brian Fitzgerald, Eric S. Raymond, Addison-Wesley Professional; 1st edition (December 31, 2001)</td></tr>
<tr><td>2</td><td colspan="7">Open Source Software: Implementation and Management, by Paul Kavanagh, Digital Press (July 26, 2004),2004 [Chapters 3, 7, 8, 9, 10, 11,12,13]</td></tr>
<tr><td colspan="8">Reference (s) :</td></tr>
<tr><td>1</td><td colspan="7">The Success of Open Source by Steven Weber , Harvard University Press (April 30, 2004)</td></tr>
<tr><td>2</td><td colspan="7">Succeeding with Open Source by Bernard Golden, Addison-Wesley Professional (August 10, 2004)</td></tr>
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10 PIT E44	3G WIRELESS NETWORKS	3	0	0	3	50	50	100
Objective(s)	To learn the basics of 3G Wireless data communications technologies. To understand various Spreading codes used in 3G Wireless Communication. To build working knowledge on various telephone networks. To study the working principles of 3G Wireless Network data transmission procedures. To study 3G Wireless Network services,3G upgrades and 4G vision..							

1	3G WIRELESS COMMUNICATION FUNDAMENTALS	Total Hrs	9
Overview of 3G – Proposals for 3G Standard – 3GPP2 - 3GPP2 - 3G Evolution Paths – CDMA Principles – Radio-Channel Access Schemes – Spread Spectrum – RAKE Receiver – Power Control – Handovers – Multiuser Detection – TDD – Modulation Techniques and Spread Spectrum – Spreading Techniques – Data Modulation.			
2	CHANNEL CODING	Total Hrs	9
Spreading Codes – Orthogonal Codes – Pseudo- Noise Codes – Synchronization Codes – autocorrelation and Cross-Correlation – Intercell Interference – Channel Coding – Coding Processes. Coding Theory – Block Codes – Convolutional Codes. Turbo Codes – Channel Coding in UTRAN.			
3	TELECOMMUNICATION NETWORKS	Total Hrs	9
Network – General Discussion. Evolution from GSM. UMTS Network Structure. Core Network. UMTS Radio Access Network. GSM Radio Access Network. Interfaces. Network Protocols. UMTS Network Evolution – Network Planning – Network Planning Terminology. Network Planning Process – Admission Control. Congestion Control – Network Management – Telecommunication Management Architecture.			
4	3G PROCEDURES	Total Hrs	9
Procedures – RRC Connection Procedures. Radio Bearer Procedures. Data Transmission, Handovers. Random Access Procedure – New Concepts in the UMTS Network – Locations Services. High-Speed Downlink Packet Access. Multimedia Broadcast/Multicast Service, Multimedia Messaging Service - Super-Charger – Prepaging - Gateway Location Register. Optimal Routing. Adaptive Multirate Codec, Support of Localized Service Area. Smart Antennas			
5	3G SERVICES	Total Hrs	9
3G Services – Service Categories. Teleservices. Bearer Services Supplementary Services. Services Capabilities. Quality of Service – 3G Applications - Application Technologies. Multimedia. Traffic Characteristics of 3G Applications. M-Commerce. Examples of 3G Applications. Terminals – The Future – New Spectrum. Satellites. 3G Upgrades. Downlink Bottleneck. 4G Vision			
Total hours to be taught			45
Text book :			
1	Juha Korhonen, “Introduction to 3G Mobile Communications”, Second Edition, Artech House, 2003		
Reference (s) :			
1	Daniel Collins, Clint Smith, “3G Wireless Networks”, McGraw – Hill , 2001		
2	Roman Kitka, Richard Levine, Lawrence J.HJarte, “3G Wireless Demystified” McGraw – Hill 2001.		

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<tr><td colspan="2">10 PIT E45</td><td>C# AND .NET</td><td>3</td><td>0</td><td>0</td><td>3</td><td>50</td><td>50</td><td>100</td></tr>
<tr><td colspan="2">Objective(s)</td><td colspan="6">The student will gain knowledge in the concepts of the .NET framework as a whole and the technologies that constitute the framework.The student will gain programming skills in C# both in basic and advanced levels. By building sample applications, the student will get experience and be ready for large–scale projects.</td></tr>
<tr><td>1</td><td colspan="5">INTRODUCTION TO C#</td><td>Total Hrs</td><td colspan="2">8</td></tr>
<tr><td colspan="8">Introducing C#, Understanding .NET, Overview of C#, Literals, Variables, Data Types, Operators, Expressions, Branching, Looping, Methods, Arrays, Strings, Structures, Enumerations.</td></tr>
<tr><td>2</td><td colspan="5">OBJECT ORIENTED ASPECTS OF C#</td><td>Total Hrs</td><td colspan="2">9</td></tr>
<tr><td colspan="8">Classes, Objects, Inheritance, Polymorphism, Interfaces, Operator Overloading, Delegates, Events, Errors and Exceptions.</td></tr>
<tr><td>3</td><td colspan="5">APPLICATION DEVELOPMENT ON .NET</td><td>Total Hrs</td><td colspan="2">8</td></tr>
<tr><td colspan="8">Building Windows Applications, Accessing Data with ADO.NET.</td></tr>
<tr><td>4</td><td colspan="5">WEB BASED APPLICATION DEVELOPMENT ON .NET</td><td>Total Hrs</td><td colspan="2">8</td></tr>
<tr><td colspan="8">Programming Web Applications with Web Forms, Programming Web Services.</td></tr>
<tr><td>5</td><td colspan="5">THE CLR AND THE .NET FRAMEWORK</td><td>Total Hrs</td><td colspan="2">12</td></tr>
<tr><td colspan="8">Assemblies, Versioning, Attributes, Reflection, Viewing MetaData, Type Discovery, Reflecting on a Type, Marshaling, Remoting, Understanding Server Object Types, Specifying a Server with an Interface, Building a Server, Building the Client, Using SingleCall, Threads.</td></tr>
<tr><td colspan="7">Total hours to be taught</td><td colspan="2">45</td></tr>
<tr><td colspan="8">Text book (s) :</td></tr>
<tr><td>1</td><td colspan="7">E. Balagurusamy, “Programming in C#”, Tata McGraw-Hill, Second Edition,2009(UnitI,II)</td></tr>
<tr><td>2</td><td colspan="7">J. Liberty, “Programming C#”, 4th ed., O’Reilly, 2007. (Unit III, IV, V)</td></tr>
<tr><td colspan="8">Reference (s) :</td></tr>
<tr><td>1</td><td colspan="7">Herbert Schildt, “The Complete Reference: C# 2.0” Tata McGraw-Hill, Second Edition,2005</td></tr>
<tr><td>2</td><td colspan="7">Robinson et al, “Professional C#”, 3rd Edition, Wrox Press, 2004.</td></tr>
<tr><td>3</td><td colspan="7">Andrew Troelsen, “Pro C# 2005 and the.NET 2.0 Platform” ,3rd Edition, Apress,2005</td></tr>
<tr><td>4</td><td colspan="7">“Understanding .NET 2/E”, David Chappell, Pearson Education, Second Edition,2006.</td></tr>
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K.S.Rangasamy College of Technology - Autonomous Regulation								R 2010
Department	Information Technology	Programme Code & Name			PIT : Information Technology			
Elective IV								
Course Code	Course Name	Hours / Week			Credit	Maximum Marks		
		L	T	P	C	CA	ES	Total
10 PIT E46	USER INTERFACE DESIGN	3	0	0	3	50	50	100
Objective(s)	To study the concept of menus, windows, interfaces, to study about business functions, study the testing methods, to study the characteristics and components of windows, to study the various controls for the windows, to study about various problems in windows design with color, text, graphics.							
1	INTRODUCTION				Total Hrs	9		
Introduction-Importance-Human-Computer interface-characteristics of graphics interface-Direct manipulation graphical system - web user interface-popularity-characteristic & principles								
2	DESIGN PROCESS				Total Hrs	9		
User interface design process- obstacles-usability-human characteristics in design - Human interaction speed-business functions-requirement analysis-Direct-Indirect methods-basic business functions-Design standards-system timings - Human consideration in screen design								
3	SYSTEM MENUS AND NAVIGATION SCHEMES				Total Hrs	9		
structures of menus - functions of menus-contents of menu-formatting -phrasing the menu - selecting menu choice-navigating menus-graphical menus								
4	CONTROLS				Total Hrs	9		
Windows: Characteristics-components-presentation styles-types-managements-organizations-operations-web systems-device-based controls: characteristics-Screen -based controls: operate control - text boxes-selection control-combination control-custom control-presentation control.								
5	WINDOWS LAYOUT AND TEST				Total Hrs	9		
Text for web pages - effective feedback-guidance & assistance-Internationalization-accesssibility-Icons-Image-Multimedia -coloring Windows layout-test :prototypes - kinds of tests - retest								
Total hours to be taught						45		
Text book :								
1	Wilbent. O. Galitz ,“The Essential Guide to User Interface Design”, Second Edition, John Wiley& Sons, Reprint 2007							
Reference (s) :								
1	Ben Sheiderman, “Design the User Interface”, Pearson Education, 1998.							
2	Alan Cooper, “The Essential of User Interface Design”, Wiley – Dream Tech Ltd., 2002.							

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10 PIT E47	INFORMATION SYSTEM DESIGN	3	0	0	3	50	50	100
Objective(s)	To know the basics of managing the digital firm. To understand the design, development and maintenance of information systems. To understand basic issues in knowledge management and information systems. To know the ethical and security issues in information systems.							
1	MANAGING THE DIGITAL FIRM				Total Hrs	9		
Why information systems – contemporary approaches to information systems – new role of information systems- major types of systems in organizations – systems from a functional perspective – enterprise applications – organizations and information systems – managers decision making and information systems – information systems and business strategy.								
2	DESIGNING INFORMATION SYSTEMS				Total Hrs	9		
Systems as planned organizational change – business process re-engineering and process improvement – overview of systems development – alternate system – Building approaches – Understanding the business value of Information Systems - The importance of change management in information system success and failure – Managing Implementation								
3	DEVELOPMENT AND MAINTENANCE OF INFORMATION SYSTEMS				Total Hrs	9		
Systems analysis and design – System development life cycle – Limitation – End User Development – Managing End Users – off-the shelf software packages – Outsourcing – Comparison of different methodologies.								
4	KNOWLEDGE MANAGEMENT, ETHICS AND SECURITY				Total Hrs	9		
Knowledge Management in the organization – Information and Knowledge base systems – Decision -support systems – Understanding ethical and Social issues packed to systems – Ethics in an Information society – The moral dimensions of Information Systems – System vulnerability and abuse – Creating a control environment – Ensuring System Quality.								
5	INFORMATION ARCHITECTURE				Total Hrs	9		
Defining Information Architecture – why Information Architecture matters – Practicing Information Architecture in the Real world – Information Ecologies – User needs and Behavior – The anatomy of Information Architecture.								
Total hours to be taught						45		
Text book(s) :								
1	Lauaon Kenneth & Landon Jane, "Management Information Systems: Managing the Digital firm", Eighth edition, PHI, 2004.							
2	Uma G. Gupta, "Management Information Systems – A Management Prespective", Galgotia publications Pvt., Ltd., 1998.							
3	Louis Rosenfel and Peter Morville, "Information Architecture for the World wide Web", O'Reilly Associates, 2002.							
Reference (s) :								
1	Steven Alter, "Information Systems – A Management Perspective", Pearson Education, 2001.							
2	Uma Gupta, "Information Systems – Success in 21st Century", Prentice Hall of India, 2000.							
3	Robert G. Murdick, Joel E. Ross and James R. Claggett, "Information Systems for Modern Management", PHI, 1994.							

<table>
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<tr><td colspan="2">10 PIT E48</td><td>RESEARCH METHODOLOGY - ENGINEERING AND MANAGEMENT STUDIES</td><td>3</td><td>0</td><td>0</td><td>3</td><td>50</td><td>50</td><td>100</td></tr>
<tr><td>1</td><td colspan="5">RESEARCH METHODOLOGY</td><td colspan="2">Total Hrs.</td><td>9</td></tr>
<tr><td colspan="9">Research methodology – definition, mathematical tools for analysis, Types of research, exploratory research, conclusive research, modeling research, algorithmic research, Research process- steps. Data collection methods- Primary data – observation method, personal interview, telephonic interview, mail survey, questionnaire design. Secondary data- internal sources of data, external sources of data.</td></tr>
<tr><td>2</td><td colspan="5">SCALES AND MEASUREMENTS</td><td colspan="2">Total Hrs.</td><td>9</td></tr>
<tr><td colspan="9">Scales – measurement, Types of scale – Thurstone’s Case V scale model, Osgood’s Semantic Differential scale, Likert scale, Q- sort scale. Sampling methods- Probability sampling methods – simple random sampling with replacement, simple random sampling without replacement, stratified sampling, cluster sampling. Non-probability sampling method – convenience sampling, judgment sampling, quota sampling.</td></tr>
<tr><td>3</td><td colspan="5">HYPOTHESES TESTING</td><td colspan="2">Total Hrs.</td><td>9</td></tr>
<tr><td colspan="9">Hypotheses testing – Testing of hypotheses concerning means (one mean and difference between two means - one tailed and two tailed tests), Concerning variance – one tailed Chi-square test.</td></tr>
<tr><td>4</td><td colspan="5">SAMPLE TESTS</td><td colspan="2">Total Hrs.</td><td>9</td></tr>
<tr><td colspan="9">Nonparametric tests- One sample tests – one sample sign test, Kolmogorov-Smirnov test, run test for randomness, Two sample tests – Two sample sign test, Mann-Whitney U test, K-sample test – Kruskal Wallis test (H-Test)</td></tr>
<tr><td>5</td><td colspan="5">ANALYSIS AND REPORT</td><td colspan="2">Total Hrs.</td><td>9</td></tr>
<tr><td colspan="9">Introduction to Disciminant analysis, Factor analysis, cluster analysis, multidimensional scaling, conjoint analysis. Report writing- Types of report, guidelines to review report, typing instructions, oral presentation</td></tr>
<tr><td colspan="8">Total hours to be taught</td><td>45</td></tr>
<tr><td colspan="9">Reference(s):</td></tr>
<tr><td>1.</td><td colspan="8">Kothari, C.R., Research Methodology –Methods and techniques, New Age Publications, New Delhi, 2009.</td></tr>
<tr><td>2.</td><td colspan="8">Panneerselvam, R., Research Methodology, Prentice-Hall of India, New Delhi, 2004.</td></tr>
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10 PIT E49	NETWORK ROUTING ALGORITHMS	3	0	0	3	50	50	100
Objective(s)	The students are expected to learn the basics of circuit switching and packet switching networks, to know the concept of high speed and mobile networks, to understand the basic routing concepts of MANET							

1	INTRODUCTION	Total Hrs	9
ISO OSI Layer Architecture, TCP/IP Layer Architecture, Functions of Network layer, General classification of routing, Routing in telephone networks, Dynamic Non Hierarchical Routing (DNHR), Trunk Status Map Routing (TSMR), Real-Time Network Routing (RTNR), Distance vector routing, Link state routing, Hierarchical routing.			
2	INTERNET ROUTING	Total Hrs	9
Interior protocol: Routing Information Protocol (RIP), Open Shortest Path First (OSPF), Bellman Ford Distance Vector Routing. Exterior Routing Protocols: Exterior Gateway Protocol (EGP) and Border Gateway Protocol (BGP). Multicast Routing: Pros and cons of Multicast and Multiple Unicast Routing, Distance Vector Multicast Routing Protocol (DVMRP), Multicast Open Shortest Path First (MOSPF), MBONE, Core Based Tree Routing.			
3	ROUTING IN OPTICAL WDM NETWORKS	Total Hrs	9
Classification of RWA algorithms, RWA algorithms, fairness and admission control, Distributed Control Protocols, Permanent routing and Wavelength requirements, Wavelength rerouting- Benefits and Issues, Light path migration, Rerouting Schemes, Algorithms- AG, MWPG.			
4	MOBILE - IP NETWORKS	Total Hrs	9
Macro-mobility protocols, Micro-mobility protocol: Tunnel based : Hierarchical Mobile IP, Intra domain Mobility Management, Routing based: Cellular IP, Handoff Wireless Access Internet Infrastructure (HAWAII).			
5	MOBILE AD –HOC NETWORKS	Total Hrs	9
Internet-based mobile ad-hoc networking communication strategies, Routing algorithms – Proactive routing: Destination Sequenced Distance Vector Routing (DSDV), Reactive routing: Dynamic Source Routing (DSR), Ad hoc On-Demand Distance Vector Routing (AODV), Hybrid Routing: Zone Based Routing (ZRP).			
Total hours to be taught			45

Reference(s):

1	Deepankar Medhi, Karthikeyan Ramasamy “Network Routing: Algorithms, Protocols”, Elsevier Inc, San Francisco CA 94111, 2007.
2	Eric Bouillet, Georgios Ellinas, Jean-François Labourdette,Ramu Ramamurthy “Path Routing in Mesh Optical Networks” John Wiley & Sons, Ltd. ISBN: 978-0-470-01565-0, 2007.
3	William Stallings, ‘High speed networks and Internets Performance and Quality of Service’, 2nd edition,Pearson Education Asia. Reprint India, 2002.
4	M. Steen Strub, ‘ Routing in Communication network, Prentice –Hall International, New york, 1995.
5	S. Keshav, ‘An engineering approach to computer networking’ Addison Wesley, 1999.
6	William Stallings, ‘High speed Networks TCP/IP and ATM Design Principles, Prentice- Hall, New York 1995.
7	C.E Perkins, ‘Ad Hoc Networking’, Addison – Wesley, 2001.
8	Ian F. Akyildiz, Jiang Xie and Shantidev Mohanty, “ A Survey of mobility Management in Next generation all IP- Based Wireless Systems”, IEEE Wireless Communications Aug.2004, pp 16-27.
9	C.Siva RamaMurthy and Mohan Gurusamy, “WDM Optical Networks – Concepts, Design and Algorithms”, Prentice Hall of India Pvt. Ltd, New Delhi ,2002.

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<tr><td>10 PIT E50</td><td colspan="2">OPTICAL SWITCHING ARCHITECTURES</td><td>3</td><td>0</td><td>0</td><td>3</td><td>50</td><td>50</td><td>100</td></tr>
<tr><td>Objective(s)</td><td colspan="8">The students are expected to learn the basics of optical access network architecture, to know the concept of optical switching networks, to understand the basic concepts of WDM, OCX and ATM.</td></tr>
<tr><td>1</td><td colspan="5">ACCESS NETWORKS</td><td colspan="2">Total Hrs</td><td>9</td></tr>
<tr><td colspan="9">Network architecture overview - today’s access networks - future Access networks -optical access network architecture - application area – Passive optical networks-Broadcast Select PON – WRPON - Case study – SUCCESS HPON- Network topology– Media access control protocol – Scheduling algorithm- Ethernet based passive optical networks –QoS.</td></tr>
<tr><td>2</td><td colspan="5">VIRTUAL TOPOLOGY DESIGN</td><td colspan="2">Total Hrs</td><td>9</td></tr>
<tr><td colspan="9">Design problem – design heuristics – topology reconfiguration due to traffic changes-Network management-Protection concepts in Ring Networks, Mesh Networks-Handling node failures- Combined SONET/WDM network design – Regular virtual topologies – Shuffle net – Implementation in broadcast select network</td></tr>
<tr><td>3</td><td colspan="5">OPTICAL INTERNET NETWORKS</td><td colspan="2">Total Hrs</td><td>9</td></tr>
<tr><td colspan="9">Optical Circuit switching- Optical Burst switching- Optical packet switching – MPLS in WDM Networks -Types MPLS Nodes – Multi protocol lambda switching – MPLS and Optical TE similarities – IP, MPLS and Optical control planes –LSP routing.</td></tr>
<tr><td>4</td><td colspan="5">OPTICAL SWITCHING</td><td colspan="2">Total Hrs</td><td>9</td></tr>
<tr><td colspan="9">Free-space optical switching – multistage optical interconnection networks- back plane optical interconnects, optical memory for switching – logic functionality – nonlinear fiber couplers, photonic switch architectures based on TDM, WDM, OCX, ATM.</td></tr>
<tr><td>5</td><td colspan="5">WAVELENGTH- CONVERTIBLE NETWORKS</td><td colspan="2">Total Hrs</td><td>9</td></tr>
<tr><td colspan="9">Routing in convertible networks – Performance Evaluation – Network with sparse wavelength conversion – Converter Placement problem – Converter problem –Rerouting - Benefits and Issues, Light path Migration, Rerouting Schemes, Algorithms–AG, MWPG.</td></tr>
<tr><td colspan="7">Total hours to be taught</td><td colspan="2">45</td></tr>
<tr><td colspan="9">Reference(s):</td></tr>
<tr><td>1</td><td colspan="8">Venkatesh, T., Murthy, C. Siva Ram ,”An Analytical Approach to Optical Burst Switched Networks “, 1st Edition, Springer US 2010.</td></tr>
<tr><td>2</td><td colspan="8">Martin Maier ,”Optical Switching Networks”, Cambridge University Press 2008, New York, NY 10013-2473, USA .</td></tr>
<tr><td>3</td><td colspan="8">C.Siva Rama Murthy and Mohan Gurusamy, “ WDM Optical Networks –Concepts, Design and Algorithms”, Prentice Hall of India Pvt. Ltd, New Delhi –2002.</td></tr>
<tr><td>4</td><td colspan="8">Uyless Black, “ Optical Network: Third Generation Transport System”,Pearson Education, Ist edition,2002.</td></tr>
<tr><td>5</td><td colspan="8">Hussein T.Mouftah and Jaafar M.H.Elmirghani, “ Photonic Switching Technology – Systems and Networks “,IEEE Press, New York -10016-5997,ISBN – 0-7803-4707-2.</td></tr>
<tr><td>6</td><td colspan="8">Rajiv Ramaswamy and Kumar N.Sivarajan, “Optical Networks – A Practical Persepctive”, Morgan Kauffman, 2004</td></tr>
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