Paper Code: IT-401 **L:3 T/P:1 C:4**
Paper ID: 15401 **Paper: Advanced Computer Networks**

Unit -I
Review of Physical, Data link layer, TCP/IP: Datalink Protocols; ARP and RARP.

Unit-II
Network Layer: Routing algorithms and protocols, Congestion control algorithm, Router Operation, Router configuration, Internetworking, IP Protocol, IPv6 (an overview), Network layer in ATM Network.
Unit-III
Transport Layer: Transport Service, Transport Protocol (TCP, UDP, ATM AAL layer protocol).

Application layer: Security, DNS, SNMP, RMON, Electronic Mail, WWW.
Unit -IV
Network Security: Firewalls (Application and packet filtering), Virtual Public Network.

Text:
1. Tananbaum A.S., "Computer Networks", 3rd Ed, PHI, 1999.
2. Laura Chappell (ed), "Introduction to Cisco Router Configuration", Techmedia, 1999.

References:
1. Black U., "Computer Networks-Protocols, Standards and Interfaces", PHI, 1996.
2. Stallings W., "Computer Communication Networks", PHI.
3 Stallings W., "SNMP, SNMPv2, SNMPv3, RMON 1&2", 3rd Ed., Addison Wesley, 1999.
4. Michael A. Miller, "Data & Network Communications", Vikas Publication.
5. William A. Shay, "Understanding Data Communications & Networks", Vikas Publication.

Paper Code: IT-403 **L:3 T/P:1 C:4**
Paper ID: 15403 **Paper: Software Testing**

Unit -I

Introduction: What is software testing and why it is so hard?, Error, Fault, Failure, Incident, Test Cases, Testing Process, Limitations of Testing, No absolute proof of correctness, Overview of Graph Theory.

Unit-II

Functional Testing: Boundary Value Analysis, Equivalence Class Testing, Decision Table Based Testing, Cause Effect Graphing Technique.

Structural Testing: Path testing, DD-Paths, Cyclomatic Complexity, Graph Metrics, Data Flow Testing, Mutation testing.

Unit-III

Reducing the number of test cases:

Prioritization guidelines, Priority category, Scheme, Risk Analysis, Regression Testing, Slice based testing

Testing Activities: Unit Testing, Levels of Testing, Integration Testing, System Testing, Debugging, Domain Testing.

Unit-IV

Object Oriented Testing: Issues in Object Oriented Testing, Class Testing, GUI Testing, Object Oriented Integration and System Testing.

Testing Tools: Static Testing Tools, Dynamic Testing Tools, Characteristics of Modern Tools.

Text:

1. William Perry, "Effective Methods for Software Testing", John Wiley & Sons, New York, 1995.
2. Cem Kaner, Jack Falk, Nguyen Quoc, "Testing Computer Software", Second Edition, Van Nostrand Reinhold, New York, 1993.
3. Boris Beizer, "Software Testing Techniques", Second Volume, Second Edition, Van Nostrand Reinhold, New York, 1990.
4. Louise Tamres, "Software Testing", Pearson Education Asia, 2002

Reference:

1. Roger S. Pressman, "Software Engineering – A Practitioner's Approach", Fifth Edition, McGraw-Hill International Edition, New Delhi, 2001.
2. Boris Beizer, "Black-Box Testing – Techniques for Functional Testing of Software and Systems", John Wiley & Sons Inc., New York, 1995.
3. K.K. Aggarwal & Yogesh Singh, "Software Engineering", New Age International Publishers, New Delhi, 2003.
4. Marc Roper, "Software Testing", McGraw-Hill Book Co., London, 1994.
5. Gordon Schulmeyer, "Zero Defect Software", McGraw-Hill, New York, 1990.
6. Watts Humphrey, "Managing the Software Process", Addison Wesley Pub. Co. Inc., Massachusetts, 1989.
7. Boris Beizer, "Software System Testing and Quality Assurance", Van Nostrand Reinhold, New York, 1984.
8. Glenford Myers, "The Art of Software Testing", John Wiley & Sons Inc., New York, 1979.

Paper Code: IT-407 **L:3 T/P:1 C:4**
Paper ID: 15407 **Paper: Artificial Intelligence**

Unit-I
Introduction:
Introduction to intelligent agents
Problem solving:
Solving problems by searching : state space formulation, depth first and breadth first search, iterative deepening
Unit-II
Intelligent search methods:
A* and its memory restricted variants
Production systems:
Design implementation and limitations, case studies
Unit-III
Game Playing:
Minimax, alpha-beta pruning
Knowledge and reasoning:
Propositional and first order logic, semantic networks, building a knowledge base, inference in first order logic, logical reasoning systems
Planning:
STRIPS partial order planning, uncertain knowledge and reasoning, probabilistic reasoning systems, Baysian networks
Unit-IV
Learning from observations:
Inductive learning, learning decision trees, computational learning theory, Explanation
based learning
Applications:
Environmental Science, Robotics, Aerospace, Medical Scioence etc.

Text Book:
1. "AI" by Rich and Knight, Tata McGraw Hill, 1992

Reference Books:
1. "Neural Networks in Computer Intelligence" by KM Fu, McGraw Hill
2. "AI: A modern approach" by Russel and Norvig, Pearson Education

Paper Code: IT-413 **L:3 T/P:1 C:4**
Paper ID: 15413 **Paper: Front End Design Tools & Web Technologies**

UNIT-I:
History of the Internet and World Wide Web – HTML 4 protocols – HTTP, SMTP, POP3, MIME, IMAP. HTML Common tags- List, Tables, images, forms, Frames; Cascading Style sheets;, Introduction to Java Scripts, Objects in Java Script, Dynamic HTML with Java Script

UNIT-II
XML: Document type definition, XML Schemas, Document Object model, Presenting XML, Using XML Processors: DOM and SAX , Java Beans: Introduction to Java Beans, Advantages of Java Beans, BDK , Introspection, Using Bound properties, Bean Info Interface, Constrained properties , Persistence, Customizes, Java Beans API, Introduction to EJB's

UNIT-III
Web Servers and Servlets: Tomcat web server, Introduction to Servelets: Lifecycle of a Serverlet, JSDK, The Servelet API, The javax.servelet Package, Reading Servelet parameters, Reading Initialization parameters. The javax.servelet HTTP package, Handling Http Request & Responses, Using Cookies-Session Tracking, Security Issues, Introduction to JSP: The Anatomy of a JSP Page. JSP Application Design with MVC , JSP Application Development: Generating Dynamic Content, Using Scripting Elements Implicit JSP Objects, Conditional Processing Sharing Session and Application Data Memory Usage Considerations

UNIT IV:
Database Access : Database Programming using JDBC, Studying Javax.sql.* package,Accessing a Database from a JSP Page, Application – Specific Database Actions,Deploying JAVA Beans in a JSP Page, Introduction to struts framework..

TEXT BOOK

1. "Internet and world wide web – How to Program", Deitel & Deitel, Goldberg, Pearson Education
2. "Using HTML 4, XML and JAVA", Eric Ladd, Jim O' Donnel, Prentice Hall of India
3. "Java Server Pages ",Hans Bergsten, SPD O'Reilly

REFERENCES

1 "Web Technology", Rajkamal, Tata McGraw-Hill, 2001. KS:
2. Web Programming, building internet applications, Chris Bates 2nd edition, WILEY Dreamtech
3. The complete Reference Java 2 Fifth Edition by Patrick Naughton and Herbert Schildt. TMH
4. Programming world wide web-Sebesta, Pearson
5. Jakarta Struts Cookbook , Bill Siggelkow, S P D O'Reilly

Paper Code: IT-451 **L:0 T/P:2 C:1**
Paper ID: 15451 **Paper: Advanced Computer Network Lab**

Paper Code: IT-461 **L:0 T/P:2 C:1**
Paper ID: 15461 **Paper: Software Testing Lab**

Paper Code: IT-455 **L:0 T/P:2 C:1**
Paper ID: 15455 **Paper: Lab assignments**

This lab will be based on elective paper(s).

Paper Code: IT-457 **L:0 T/P:0 C:5**
Paper ID: 15457 **Paper: Minor Project**

Paper Code: IT-459 **L:0 T/P:0 C:1**
Paper ID: 15459 **Paper: Summer Training Report**

Students will undergo summer training/industry visit/In-house training/In-house project during the summer break after the completion of sixth semester. Report of the same is required to be submitted to the school. Viva-voce examination will be conducted based on the report submitted by the student. A panel of examiner will be appointed by the Dean, USIT.