10.40 SCS3204 Internet Computing (4 CU)

Course Description:

This course covers the basic principles and practices of distributed computing over the Internet. The course is not intended to be a course on Web site development tools, but focuses on the Internet as a domain for sharing resources with Grids, distributed computing with Web services, and service-oriented computing. The Internet is increasingly used as a large interconnection network for deploying distributed applications to solve challenging problems in diverse areas.
In this course you will learn the basic foundations of Internet computing and use modern frameworks to develop Internet-based applications with Web services, Grids, and other technologies.

Course Objectives:

1.To impart the basic concepts of Internet Computing and Java Programming

2.To develop understanding about Internet Computing with the help of Java Platform and establishing network connections using Socket Programming

3.There has been a significant increase in the demand for software engineers skilled in Internet computing technologies. The objective of this course is to review the state-of-the-art Internet computing technologies and practice with frameworks and implementations. Skills will be learned from hands-on projects related to the lecture topics listed in the topics list below.

Learning Outcomes:

1.Understand the basic concepts of Internet services and related technologies
2.Be proficient in using Java Servlets and related Web development tools
3. Identify different components of client/server Architecture on Internet computing
4.Design, develop and implement interactive Web applications
5.Know how to develop and deploy applications and applets in Java
6.Know how to design and develop GUI using Java Swing and AWT

Lecture Topics

•Foundations

◦CSP (communicating sequential processes)

◦Pi calculus

•Programming languages and frameworks for distributed computing

◦Linda tuple space

◦JCSP (Java CSP)

◦Corba and DCOM

◦RPC and Java RMI

◦PVM and MPI

◦XML Web services

•Mobility (optional)

◦Theory: mobile ambients

◦Practice: mobile agents

•Naming and registries

◦DNS

◦LDAP

◦UDDI

•XML Web services

◦Service-oriented architectures

◦Web servers (tomcat, IIS) and the HTTP protocol

◦XML, XML schema, SOAP, WSDL, XQuery

◦Tools and frameworks (gSOAP, Axis, .NET and mono project)

◦Message-level security with WS-Security

◦WS-* protocols

•Grid computing

◦Globus

◦OGSA and WSRF

•Cluster computing

◦Condor

◦Oscar

•Peer-to-peer computing

◦File sharing (Gnutella)

•Remote file systems

◦ftp, rfs, shfs

•Internet security

◦Basic principles of symmetric and asymmetric cryptography

◦Digital certificates, authentication, non-repudiation

◦Transport-level security with HTTPS and SSL encryption

◦Firewalls

◦Tunneling

•Related Web technologies

◦Ajax

◦VoiP

Mode of Delivery:

Lectures, Assignment, Lab

Mode of Assessment:

Assignment ,tests, examination lab exercises

Reading List:

1. Herbert Schildt, Java 2 Complete Reference, 5th ed., Tata McGraw Hill, New Delhi, 2010

2.Deitel & Deitel Java How To Program 7th ed., Pearson Education ,New Delhi, 2008

3.Y Daniel Liang Introduction to Java Programming 7th ed., Pearson Education ,New Delhi, 2010

4.R Krishnamoorthy, S Prabhu Internet & Java Programming, New Age International Publishers, New Delhi, 2008

5.Rajkumar Buyya, S Thamarai Selvi, Xingchen Chu, Object Oriented Programming with Java, McGraw Hill, New Delhi, 2009

Detailed Course Content:

Unit	Topic	Details	Hours
1		Introduction to Java- Genesis of Java- Features of Java –Data Types- Variables and Arrays-Operators- Control Statements – Selection Statements – Iteration Statements-Jump Statements.	10
2		Creating & using classes in Java – Methods and Classes – Inheritance – Super Class –Method Overriding –Packages and Interfaces – Implementing Interfaces- Exception Handling – Exception Types, Threads-Multithreaded programs, Thread Priorities and Thread synchronization.	12
3		I/O – I/O Basics – Byte Streams and Character Streams, Reading Console Input, Collections Framework, Applets & Applet Architecture-Applet Skelton- Passing Parameters to Applet, Event Handling-Event Model-Event Classes – Event Listener Interfaces, AWT – AWT Classes – AWT Controls – Layout Managers and Menus. Swing- JApplet – Jbuttons - JTables.	14
4		Network Programming with Java – Socket Programming in Java-Client Sockets- Server Sockets- Secure Server Sockets- TCP/IP Programming with Java – Datagrams, IP multicasting, Remote Method Invocation.	13
5		Advanced Java Programming – Accessing Databases with JDBC, Servlets, Image processing using Java – Image Filter – Web Application development using Java Technologies- Java Server Faces.	11
	Total Contact Hours		**60**