Semester IV         Year: 2014-2015

Course Title: Client-Server Programming  Course Code: 14SCN41
Credits(L:T:P): 3:0:1  Core/Elective: Core
Type of Course: Lecture and practical  Total Contact Hours: 50

COURSE OBJECTIVES

- To understand Client-Server software, Context Switching and Protocol Software, I/o.
- To understand System Calls, Basic I/O Functions available in UNIX
- To understand the Socket interface, TCP, UDP in detail.
- Various client software applications and their issues.
- To understand the concept of Socket interface in client server programming.

TOPICS:

MODULE I
The Client Server Model and Software Design: Introduction, Motivation, Terminology and Concepts

MODULE II
The Socket Interface: Introduction, Berkley Sockets, Specifying a Protocol Interface, The Socket Abstraction, Specifying an End Point Address, A Generic Address Structure, Major System Calls used with Sockets, Utility Routines for Integer Conversion, Using Socket Calls in a Program, Symbolic Constants for Socket Call Parameters. Algorithms and Issues in Client Software Design: Introduction, Learning Algorithms instead of Details, Client Architecture, Identifying the Location of a Server, Parsing an Address Argument, Looking up a Domain Name, Looking up a well-known Port by Name, Port Numbers and Network Byte Order, Looking up a Protocol by Name, The TCP Client Algorithm, Allocating a Socket, Choosing a Local Protocol Port Number. A fundamental Problem in choosing a Local IP Address, Connecting a TCP Socket to a Server, Communicating with the Server using TCP, Reading a response from a TCP Connection, Closing a TCP Connection, Programming a UDP Client, Connected and Unconnected UDP Socket, Using Connect with UDP, Communicating with a Server using UDP, Closing a Socket that uses UDP, Partial Close for UDP, A Warning about UDP Unreliability. 10 Hours

MODULE III
IV SEM MTECH (CNE)


10 Hours

MODULE IV

10 Hours

MODULE V


10 Hours

LABORATORY WORK:
1. Design, develop, and execute a program in C under UNIX / LINUX environment to implement a simple iterative connectionless server and demonstrate its functioning.
2. Design, develop, and execute a program in C under UNIX / LINUX environment to implement a simple iterative connection-oriented server and demonstrate its functioning.
3. Design, develop, and execute a program in C under UNIX / LINUX environment to implement a simple concurrent connection-oriented server and demonstrate its functioning.
4. Design, develop, and execute a program in C under UNIX / LINUX environment to implement a simple Day / Time Server and demonstrate its functioning.
5. Design, develop, and execute a program using JAVA networking facilities to implement a simple Day / Time Server and demonstrate its functioning. Repeat the above problems.

COURSE OUTCOMES
The student will be able to:
- Gain in depth knowledge about Client-Server software, Context Switching and Protocol Software, I/o.
- Programming System Calls, Basic I/O Functions available in UNIX
- Gain the knowledge on Socket interface, TCP, UDP in details.
IV SEM MTECH (CNE)

- Pros and cons of Client Software Various applications and their issues.

TEXT BOOK:

COURSE OBJECTIVES

- To Become familiar with the concepts of computer networks
- What is a computer network and what are the fundamental protocols.
- To analyze network architectures in stochastic and deterministic way.
- RSVP, Principles of TCP
- To explore more on different network protocols.
- To understand the knowledge of multiplexing, streaming sessions in computer network.

TOPICS:

MODULE I
Introduction: Two examples of analysis: Efficient transport of packet voice calls, Achievable throughput in an input-queuing packet switch; the importance of quantitative modeling in the Engineering of Telecommunication Networks.  

10 Hours

MODULE II
Multiplexing: Network performance and source characterization; Stream sessions in a packet network: Delay guarantees; Elastic transfers in a packet network; Packet multiplexing over Wireless networks.  

10 Hours

MODULE III
Stream Sessions: Deterministic Network Analysis: Events and processes in packet multiplexer models: Universal concepts; Deterministic traffic models and Network Calculus; Scheduling; Application to a packet voice example; Connection setup: The RSVP approach; Scheduling (continued).  

10 Hours

MODULE IV
Stream Sessions: Stochastic Analysis: Deterministic analysis can yield loose bounds; Stochastic traffic models; Additional notation; Performance measures; Little’s theorem, Brumelle’s theorem, and applications; Multiplexer analysis with stationary and ergodic traffic; The effective bandwidth approach for admission control; Application to the packet voice example; Stochastic analysis with shaped traffic; Multihop networks; Long-Range-Dependent traffic.  

10 Hours

MODULE V
Adaptive Bandwidth Sharing for Elastic Traffic: Elastic transfers in a Network; Network parameters and performance objectives; sharing a single link; Rate-Based Control; Window-Based Control: General Principles; TCP: The Internet’s Adaptive Window Protocol; Bandwidth sharing in a Network.  

10 Hours
IV SEM MTECH (CNE)

Course Outcomes:

On completion, student will be able to:

- List and classify network services, protocols and architectures, explain why they are layered.
- Implement key Internet applications and their protocols, and will apply to develop their own applications (e.g. Client Server applications, Web Services) using the sockets API.

TEXT BOOKS:

REFERENCE BOOKS:
Course Title: Service Oriented Architecture
Course Code: 14SCN422
Credits(L:T:P): 4:0:0
Type of Course: Lecture
Total Contact Hours: 50

Course Objectives:
- To understand various architecture for application development
- To understand the importance of SOA in Application Integration
- To learn web service and SOA related tools.
- To learn the concepts of SOA governance.

Topics:

MODULE I

MODULE II

MODULE III

MODULE IV

MODULE V
APPLICATION INTEGRATION: JAX –WS 2.0 client side/server side development – Packaging and Deployment of SOA component – SOA shopper case study – WSDL centric java
IV SEM MTECH (CNE)


10 Hours

COURSE OUTCOMES

The student will be able to:

- Compare the different IT architecture
- Analysis and design of SOA based applications
- Implementation of web service and realization of SOA
- Implementation of RESTful services
- Design and implementation of SOA based Application Integration using BPEL

Textb Book:

REFERENCES:
**Course Title:** Mobile Application Development  
**Course Code:** 14SCN423  
**Credits (L:T:P):** 4:0:0  
**Type of Course:** Lecture  
**Total Contact Hours:** 50

**Course Objectives:**
- To Understand system requirements for mobile applications
- To Generate suitable design using specific mobile development frameworks
- To Generate mobile application design
- To Implement the design using specific mobile development frameworks
- To acquire knowledge of android applications development.

**Topics:**

**MODULE I**
Introduction to mobile communication and computing; Introduction to mobile computing, Novel applications, limitations and GSM architecture, Mobile services, System architecture, Radio interface, protocols, Handover and security. Smart phone operating systems and smart phones applications.  
**10 Hours**

**MODULE II**
**10 Hours**

**MODULE III**
The Android Debug Bridge (ADB), Basic Widgets Understanding the Role of Android Application Components, Event Handling , Displaying Messages Through Toast, Creating and Starting an Activity, Using the EditText Control  Building Blocks for Android Application Design, Laying Out Controls in Containers, Utilizing Resources and Media, Using Selection Widgets and Debugging Displaying and Fetching Information Using Dialogs and Fragments  
**10 Hours**

**MODULE IV**
Using Selection Widgets and Debugging Displaying and Fetching Information Using Dialogs and Fragments Advanced Android Programming: Internet, Entertainment, and Services, Implementing drawing and animations,  
**10 Hours**
IV SEM MTECH (CNE)

MODULE V
Displaying web pages and maps, communicating with sms and emails, creating and using content providers: Creating and consuming services, Publishing android applications.

10 Hours

Course Outcomes:
The student will be able to:

- Describe the requirements for mobile applications
- Explain the challenges in mobile application design and development
- Develop and design for mobile applications for specific requirements
- Implement the design using Android SDK
- Implement the design using Objective C and iOS

Text Books:

2. B.M.Hirwani- Android programming Pearson publications-2013
Course Title: Cybercrime and Digital Forensic  
Course Code: 14SCN424  
Credits(L:T:P): 4:0:0  
Type of Course: Lecture  
Core/Elective: Elective  
Total Contact Hours:50

Course Objectives
- To understand Accounting Forensics
- To analyze the nature and effect of cyber crime in society.
- To understand Sarbanes-Oxley Financial and Accounting Disclosure Information
- To understand Computer Crime and Criminals
- To understand Liturgical Procedures

Topics:

**MODULE I**
10 Hours

**MODULE II**
10 Hours

**MODULE III**
10 Hours

**MODULE IV**
10 Hours
IV SEM MTECH (CNE)

MODULE V


Course Outcomes
The student will be able to:

• Understand financial and accounting forensics, and explain their role in preventing various forms of fraud.
• Distinguish various types of computer crime, and use computer forensic techniques to identify the digital fingerprints associated with criminal activities.
• Know how to apply forensic analysis tools to recover important evidence for identifying computer crime.
• Develop a custom computer forensic analysis tool.

Text:

References: