VIII Semester

**CMP 336 Network Programming (3 – 0 – 2)**

**Evaluation:**

|  |  |  |  |
| --- | --- | --- | --- |
|  | Theory | Practical | Total |
| Sessional | 30 | 20 | 50 |
| Final | 50 | - | 50 |
| Total | 80 | 20 | 100 |

**Objectives:**

Computer network programming involves writing computer programs that enable process to communicate with each other across a computer network or within same system. **Network programming is client-Server programming** so to make

Two processes to communicate with each other one process must take the initiative while the other is waiting for it. Therefore, network programming ineluctably assumes a client-server model. The process initiating the communication is a client, and the process waiting for the communication to be initiated is a server.

The core objectives of the course is to design and implement the client-server based system, which must able to communicate across the different network platform without depending on operating system architecture.

At the end of the course, the students would able to design and implement computer network based client server application which can talk across the network or within the same system.

**Course Contents:**

1. **Network Programming Fundamentals (6 hrs)** 
   * + Introduction to Networking and network programming
     + Client/Server mode
     + Communication Protocol (TCP, IP, UDP, SCTP)
     + TCP state transition Diagram
     + Protocol comparison

1. **UNIX Programming (22 hrs)** 
   * + Sockets Introduction
     + Socket Address Structures
     + Values Result arguments
     + Byte ordering and Manipulation functions
     + Fork and exec functions
     + Concurrent Servers
     + UNIX /INTERNET domain socket
     + Socket System Calls
     + Passing file descriptor
     + I/O models (blocking, non-blocking, multiplexing, signal driven, asynchronous)
     + Socket option, getsockopt, setsockopt, fcntl
     + Daemon Process, Syslogd Daemon, syslog function, ioctl operation, ioctl function
     + Socket operations
     + UNIX and Internet domain socket implementation.

1. **Winsock Programming (15 hrs)** 
   * + Introduction to Winsock architecture
     + Winsock DLL
     + Windows sockets and Blocking I/O
     + Windows Socket Extension; Setup and Cleanup Function
     + Function for Handling Blocked I/O
     + Asynchronous Database function
     + Asynchronous I/O functions
     + Error Handling Functions; Asynchronous Operation
     + Using Non-Blocking socket, Non-Blocking with connect
     + Select in conjunction with accept, select with recv/recvfrom and send/sendto
     + Sending and Receiving Data over connection.

1. **Network Utilities and Application (2 hrs)** 
   * + Telnet  Netsat
     + ifconfig/ipconfig
     + ping
     + TFTP
     + Remote Login

**Laboratory Exercises:**

* 1. Implementing ECHO server using C and LINUX.
  2. Implementing Date and Time Routines in C and LINUX.
  3. Implementing Concurrent Server using FORK and EXEC call in LINUX.
  4. UNIX and Internet Domain SOCKET in LINUX using C.
  5. Implementing Winsock using C.
  6. Implementing Message Exchanger between LINUX and Windows.

**Reference Books:**

* 1. Steven, R., UNIX network Programming VOL-1
  2. Alok k. Sinha., Network Programming in WINDOWS NT, Addison Wesley,1996
  3. Douglas E. Comers, David L. Stevens Internetworking with TCP/IP Volume III, Second Edition

**CMP 420 Software Project Management (3 – 1 – 0)**

**Evaluation:**

|  |  |  |  |
| --- | --- | --- | --- |
|  | Theory | Practical | Total |
| Sessional | 50 | - | 50 |
| Final | 50 | - | 50 |
| Total | 100 | - | 100 |

**Course Objectives:**

* The objective of this course is to provide exposure to the student in the area of Software Project Management as a new management framework uniquely suited to the complexities of modern software development process.
* This course discusses the software engineering approach to modern software development process (Unified Process).

**Course Contents:**

1. **Software Management Practice and Software Economics (12 hrs)** 
   1. Conventional Software Management Theory and Practice
   2. Software Economics and Cost Estimation
   3. Improving Software Economics
   4. Software Process
   5. Team Effectiveness and Software Environment and Quality Target
   6. Principles of Conventional Software Engineering
   7. Principles of Modern Software Management
   8. Iterative Process

1. **Software Process Primitives and Process Management Framework (14 hrs)**
   1. Software Process Life-Cycle Phases
   2. Various Elements of the Software Process (Management, Engineering and Pragmatic)
   3. Technical and Management Perspective of Software Architecture
   4. Software Process Workflow and Iteration Workflow
   5. Status Monitoring - Software Process Checkpoints and Milestone

1. **Techniques of Planning, Controlling and Automating Software Process (15 hrs)** 
   1. Iterative Process Planning (Process Work Breakdown Structure, Planning Guidelines, Cost and Schedule Estimation Process, Iteration Planning Process)
   2. Project Organization and Responsibilities
   3. Process Automation - Tools and Environment
   4. Project Control and Process Automation
   5. Process Customization

1. **Modern Approach to Software Project and Economics (4 hrs)**
   1. Elements of Modern Software Projects and Management Principles
   2. Next-Generation Software Economics and Cost Models
   3. Modern Process Transition - Paradigm Shifts

***Note****: This course module does not have any laboratory assignments. However, the conceptual clarity gained from the subject will be utilized during the Project Work of 8th Semester.*

**Text Book**:

Royce, W., *Software Project Management - A Unified Framework*, Addison-Wesley, 2000,

ISBN: 81-7808-013-3

**Reference Book**:

Conway, K., *Software Project Management - From Concept to Deployment*, IDG Books, 2001,

ISBN: 81-7722-109-4

**PRJ 400.5 Project (0-0-5)**

**Evaluation:**

|  |  |  |  |
| --- | --- | --- | --- |
|  | Theory | Practical | Total |
| Sessional | - | 100 | 100 |
| Final | - | - | - |
| Total | - | 100 | 100 |

**Course Objectives:**

The objective of this project work is to provide the students to plan and complete an individual engineering design project in the area of electronics under the supervision of Instructors.

**Suggested Materials:**

Relevant texts, Manuals, Computer Journals and Proceeding, Internet.

**Procedures:**

The project course involve working on a proposed design project under direct supervision of faculty members of Computer Engineering Department. Same project could be supervised by instructors of departments other than computer. The selected project shall be electronic hardware based or electronics computer based but it should be relevant, as possible, to the local industries environment and may in fact, be selected in consultation with the industries. The project must be started at the beginning of seventh semester. But the evaluation will be made on eight semester.

**Evaluation :** There are there stages in evaluation, they are :

**First stages** : 10% of the mark shall be based on the followings :

1. project Proposal
2. Project plan
3. Budgeting

**Second stage** : 70% of total mark shall be based on the following :

**Work performed (50 %)**

* System Design
* Thoroughness
* Understanding of methods used in the project
* Amount of work performed
* Level of achievement
* Ability to work with others
* Ability to identify problems
* Project planning skills.

Documentation (20%)

* Report organization
* Writing style
* Completeness of the report
* Readability
* Organization and analysis of data and results

**Third stage (20%) :**

An oral defense of the project work to be conducted on the last week of final semester term. The defense will be evaluated by external examiner (external to the department or from industries