

COURSE DESCRIPTION

Department and Course Number: CSCI 561

Course Title: Computer Networks

Current Catalog Description : Analysis of loosely coupled computer communication; communication protocols and network services; an open systems interconnection model is presented and compared to selected examples of computer networks.

Total Credits: 3 hours

Coordinator: P. Tobin Maginnis, Associate Professor of Computer and Information Science.

Textbook: Stevens, W. Richard; *UNIX Network Programming, Volume 1: Networking APIs - Sockets and XTI (2nd Edition)*, Prentice-Hall, 1997.

Other required materials: Study guides and miscellaneous class handouts.

References:

1. <http://www.kohala.com/start/>
2. Comer, Douglas E.; *Internetworking with TCP/IP Vol.1: Principles, Protocols, and Architecture (4th Edition)*, Prentice-Hall, 2000.
3. Comer, Douglas E. & David L. Stevens; *Internetworking with TCP/IP Vol. II: ANSI C Version: Design, Implementation, and Internals (3rd Edition)*, Prentice-Hall, 1998.

Course Goals: Juniors, seniors, and graduate students are provided with theory and examples of computer networks from a system and application perspective.

Prerequisites by Topic:

1. Programming expertise in a high-level language such as Java, C, or Pascal (CSCI 211).
2. Familiarity with operating system services and programming (CSCI 423).
3. Preferred to have familiarity with Unix programming environment.
4. Preferred to have general familiarity with networking issues of LANs, networking routing, and transport stations.

Major Topics Covered in the Course:

1. Transport station (3 hours)
2. Overview of TCP/IP, XNS, SNA, NetBIOS, OSI, and UUCP protocols (6 hours)
3. Berkeley sockets (6 hours)
4. Domain name service (3 hours)
5. Subnet routing and transport multiplexing (41 hours)
6. Network utility functions (8 hours)
7. DHCP protocol (2 hours)
8. Security (4 hours)
9. Time, date, and ping (1 hour)
10. Performance (3 hours)
11. Test (5 hours)

Operating Systems and Languages: Unix, Linux, C, Java

Laboratory projects :

1. FTP Stevens code examples and library from <http://www.kohala.com/start/> and install it on a Linux or Unix box of your choice. Caution: make sure the version of Unix you plan to use supports the BSD socket API. (One week to complete)
2. Configure and test the time client and server examples for the TCP and UDP transport protocols. (One week to complete)
3. Implement the echo sever from Stevens' text. (Two weeks to complete)
4. Design a peer-to-peer resource sharing algorithm. (Two weeks to complete)
5. Implement your p2p algorithm using Steven's library. (Remainder of the semester)

Estimate of ABET/CAC Category Content:

| | CORE | ADVANCED | | CORE | ADVANCED |
|-----------------|-------|---------------|--|-------|---------------|
| Data Structures | _____ | _____ 1 _____ | Computer Organization and Architecture | _____ | _____ 1 _____ |
| Algorithms | _____ | _____ 1 _____ | Concepts of Programming Languages | _____ | _____ |
| Software Design | _____ | _____ | | _____ | _____ |

Oral and Written Communications:

Not a significant focus of this course.

Social and Ethical Issues:

Not a significant focus of this course.

Theoretical Content (Foundations):

Not a significant focus of this course.

Problem Analysis:

Not a significant focus of this course.

Solution Design

Not a significant focus of this course.