Kutztown University
Kutztown, Pennsylvania

Department Submitting Proposal: Computer Science
Suggested Course Prefix(es) and No. Level:CSC 512
Date Approved by Department: _____

CSC 512: Networking II

I. Catalog Description

CIS 512: Networking II 3 s.h.

This course deals with the implementation of all TCP/IP details. Algorithms at all layers of the TCP/IP architecture will be examined. Network hardware and management will be explored in detail. Prerequisites: CIS 411 or unconditional acceptance to the graduate program.

II.Rationale

The use of networks in every day life has been increasing exponentially over the past decade. It is important for graduate students to have a strong foundation in advanced networking concepts. This course will provide an important foundation in networking. Students will be able to incorporate these topics with software engineering concepts learned in other courses to enable them to develop network protocols and applications.

III. Course Objectives.

Upon satisfactory completion of this course the student will be able to:

A. Define terms common to networking.

B. Identify the concepts associated with the TCP/IP architecture model.

C. Identify terminology used in hardware and software associated with networking.

D. Summarize the various network routing protocols.

E. Describe network management and associated protocols.

IV. Course Assessment

The course assessment will be a subset of tests, projects, papers, presentations, quizzes, homework, team assignments and final exam.

V. Course Outline

A. Introduction to Networking
   1. Terminology
   2. Concepts
   3. Types of Networks
   4. Topologies

B. TCP/IP architecture model
   1. Physical Layer
   2. Data Link Layer
   3. Network Layer
   4. Transport Layer
   5. Applicatoin Layer

C. Network hardware
      a. Hubs
      b. Bridges
      c. Routers
      d. Switches

D. Network Protocols
   1. TCP
   2. UDP
   3. IP

E. Internet Addresses
   1. IP Addresses
   2. DNS
   3. ARP
   4. RARP
   5. CIDR
   6. NAT

F. Routing Protocols
   1. Concepts
   2. Algorithms
   3. Protocols

G. Applications
   1. BOOTP
   2. DHCP
   3. DNS

4. VPN

H. Wireless Networks
   1. Concepts
   2. Protocols

I. Network Management
   a. Introduction
   b. Purpose
   c. Protocols

VI. Instructional Resources

Black, Uyless D., *Internet Architecture: an Introduction to IP Protocols*. Upper Saddle River, NJ., Prentice Hall PTR, 2000.

Black, Uyless D., *IP Routing Protocols: RIP, OSPF, BGF, PNNI, and Cisco Routing Protocols*. Upper Saddle River, NJ, Prentice Hall, 2000.

Boecking, Stefan, *Object-Oriented Network Protocols*. Addison-Wesley, 2000.

Comer, Douglas E. *Internetworking with TCP/IP, Volume I: Principles, Protocols, and Architecture*. Fourth Edition. Upper Saddle River, NJ, Prentice Hall, 2000. (TK5105.585 .C66 2000)

Comer, Douglas E. *The Internet Book: Everything You Need to Know About Computer Networking and How the Internet Works*. Fourth edition. Prentice Hall, 2006.

Comer, Douglas E. and Droms, Ralph E. *Computer Networks and Internets: with Internet Applications*. Fourth edition. Pearson/ Prentice Hall, Upper Saddle River, NJ, 2004. (library received one copy 9/21/2007)

Flickenger, Rob. *Building Wireless Community Networks*. Second edition. O'Reilly, 2003. (available in KU's Safari Books Online)

Hagen, Silvia. *IPv6 Essentials.* O'Reilly, 2002. (available in KU's Safari Books Online)

Halsall, Fred. *Computer networking and the Internet.* Fifth edition. Addison-Wesley, 2005. (library received a copy 9/21/2007)

Hvitema, Christian, *Routing in the Internet*. (Second edition). Antibes, France, Prentice Hall PTR, 2000.

Kozierok, Charles. *The TCP/IP Guide: A Comprehensive, Illustrated Internet Protocols Reference*. No Starch Press, 2005.

Kurose, James F., and Keith W. Ross, *Computer Networking: A Top-Down Approach Featuring the Internet*. Third edition. Pearson/Addison Wesley, Boston, 2005. (TK5105.875.I57 K88 2005)

Matthews, Jeanna. *Computer Networks: Internet Protocols in Action*. Wiley, 2005.

Murthy, C. Siva Ram and Manoj, B. S. *Ad Hoc Wireless Networks Architectures and Protocols.* Prentice Hall, 2004. (available in KU's Safari Books Online)

Perlman, Radia, *Interconnections: Bridge, Routers, Switches and Internetworking Protocols*. (Second Edition), Addison Weslsy, Reading, MA., 2000.

Peterson, Larry L and Davie, Bruce S. *Computer Networks: A Systems Approach.* Fourth edition. Morgan Kaufmann, 2007.

Puzmanova, Rita, *Routing and Switching: Time of Convergence*. Addison Wesley, 2002.

Seifert, Rich, *The Switch Book: The Complete Guide to LAN Switching Technology*. New York, John Wiley & Sons, 2000.

Shepard, Steven. *RFID: radio frequency identification*. McGraw-Hill, New York, 2005. (TK6553 .S485 2005)

Stallings, William. *Computer networking with Internet protocols and technology*. Pearson/Prentice Hall, Upper Saddle River, NJ, 2004. (library received one copy 10/10/2007)

Tanenbaum, Andrew S. *Computer Networks*. Fourth edition. Prentice Hall PTR, 2002.

Tomsho, Greg. *Guide to Networking Essentials*. Fifth edition. Course Technology, 2006.

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