CPE 465 Advanced Computer Networks

1. CPE 465 Advanced Computer Networks

2. credit units 4 contact hours 6

3. Course Coordinator: John Bellardo


5. a. Course Description: Advanced topics in computer networks; greater detail of protocol standards and services provided by the network; focus on current industry and research topics. 3 lectures, 1 laboratory.

   b. Prerequisite: CSC/CPE 464 and CSC/CPE 453.

   c. Required/Elective/Selective Elective for CPE, CSC, EE, SE

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6. a. Course Learning Objectives
The student will be able to:
- Critique the standards and implementation issues related to each of the following major networking topics:
  - Quality of Service (QoS)
  - Virtual Circuit Packet Switching technologies
  - Next generation networks (e.g IPv6, emerging wireless standards)
  - Network Security
- Critique, in-depth, at least one major Internet standard protocol.
  - Study and implement the protocol.
- Independently study an area of computer networks.

   b. Level at which Student Outcomes are addressed
   (“B” = Basic level, “I” = Intermediate level, “A” = Advanced level)

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7. Major Topics Covered: (number of lecture hours per)
Content and duration will depend on instructor.
- Network Performance Analysis (Router Testing)
- IPv6
- CIDR and VLSM
- Domain Name Service
- Virtual Circuit Packet Switching (MPLS, ATM)
  - ATM Architecture (Physical Layer, ATM Layer, AAL)
  - QoS, Call Admission Control (CAC)
  - MPLS and GMPLS
- Wireless Networking
- QoS (Multimedia Networking)
  - Router Queuing Techniques (WFQ, RED)
  - Improvements to Best Effort
  - Integrated Services Architecture
  - Differential Services
- Multicast
  - Group Membership (IGMP)
  - Routing Protocols (Dense Mode vs. Sparse Mode)
  - Reliable Multicast (Source Based, Receiver Based)
- HTTP
- Network Security
  - DES, RSA, MD5
  - Key Servers
  - Firewalls, NAT
  - IPSEC, VPN