Course Number: EE660

Course Title: High Speed Networks: Design Principles and Recent advances

Catalog Description: Latest developments in computer networking and telecommunications will be covered via class lectures and assigned readings. Design principles of high speed networks. Wireless wide area and local area networks. Quality of service.

Credit: 3.0

Coordinator: Yusuf Ozturk, Professor of Electrical and Computer Engineering

Instructor: Yusuf Ozturk
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Class/Laboratory Schedule (Sessions per week and hours per session): The class is comprised of two 75 minutes lectures per week. By the nature of the course, this is a design course which involves programming assignments, simulation model developments and engineering design documentation.

Prerequisite: COMPE 560 or Consent of the Lecturer

Course Objectives:
- Understand the fundamental concepts, design and implementation of high speed wireless networks
- Review and analyze cross layer network protocols
- Design and document a high speed wireless network

Topics:
- Fundamentals and design principles
- Review of TCP/IP Protocol Stack
- Wireless networks: IEEE 802.11 (a,b,g,n,s) Wireless LAN Standard, Mobile IP
- Quality of Service (LAN and WAN QoS)
- Residential Networks, Design Principles - An engineering view
- Design Principles of High Speed Wireless Networks
  - Channel Bonding
  - Frame Aggregation
- PHY frame bursting
- Cumulative acknowledgement
- Medium Access Control Protocol
- Self Organizing and Cross Layer Network Protocols
- Network architecture and topology
- Network control and signaling
- Network Components
  - Links
  - Switches and routers
- End systems
- End-to-end protocols
- Networked applications
- Performance Modeling and Estimation in High Speed Data Networks
- Bandwidth estimation and traffic conditioning
- Project: To be announced

**Recommended Reference Books:**

High Speed Networks, Stallings
High performance TCP/IP Networking Hassan, Jain

**Supplemental Material:** Assigned Reading from literature

**Grading Plan:**

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<tr>
<th>Component</th>
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<tr>
<td>Project 1</td>
<td>25%</td>
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<td>Midterm 1</td>
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<td>Paper – reading/report</td>
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<td>Final Exam</td>
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Academic integrity is one of the fundamental principles of a university community. San Diego State University expects the highest standards of academic honesty from all students. Violations of academic integrity include the following: (1) unauthorized assistance on an examination, (2) falsification or invention of data, (3) unauthorized collaboration on an academic exercise, (4) plagiarism, (5) misappropriation of research materials, (6) unauthorized access of an instructor’s files or computer account, and (7) any other serious violation of academic integrity as established by the instructor.
If your academic integrity is not maintained on a test or assignment, you will automatically receive a grade of zero for that test or assignment and you will be reported to the Dean’s Office, in accordance with SDSU academic integrity policy. Penalties can be severe. More specific information is available in the SDSU Bulletin, both in print and on-line.

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If you are a student with a disability and believe you will need accommodations for this class, it is your responsibility to contact Student Disability Services at (619) 594-6473. To avoid any delay in the receipt of your accommodations, you should contact Student Disability Services as soon as possible. Please note that accommodations are not retroactive, and that I cannot provide accommodations based upon disability until I have received an accommodation letter from Student Disability Services. Your cooperation is appreciated.