Course: ECE 54700 - Introduction to Computer Communication Networks

Type of Course: Technical Elective for the CmpE and EE programs

Catalog Description: A qualitative and quantitative study of the issues in design, analysis, and operation of computer communication and telecommunication networks as they evolve toward the integrated networks of the future, employing both packet and circuit switching technology. The course covers packet and circuit switching, the OSI standards architecture and protocols, elementary queuing theory for performance evaluation, random access techniques, local area networks, reliability and error recovery, and integrated networks.

Credits: 3, Dual Level, Undergraduate-Graduate

Contact Hours: 3

Prerequisite Courses: ECE 30200 or equivalent.


Course Objectives: To introduce students to the design, analysis and performance evaluation of computer communication and telecommunication networks through an understanding of their architectures and protocols.

Course Outcomes: Students who successfully complete this course will have demonstrated:
1. An understanding of network architecture, protocols, and design principles (a, e)
2. An understanding of the key application-layer concepts through examining examples of network applications (a, c, e)
3. An understanding of the service model and design principles of transport layer, and how these are implemented in existing protocols (e.g., UDP and TCP) (a, c, e)
4. An understanding of the service model and design principle of network layer, and how these are implemented in existing protocols (e.g., IP) (a, c, e)
5. An understanding of how routing is performed in the Internet. (a, c, e)
6. An understanding of basic concepts and technologies (e.g., error
detection and correction, multiple access) of the link layer (a, c, e)
7. An understanding of the design of switched local area networks
(LANs) and how switching is performed in wired Ethernet. (a, c, e)
8. An ability to calculate network performance metrics, such as
throughput and delays. (a, e)
9. An ability to use a packet sniffer to observe and analyze network
data traffic, and present results in forms of lab reports. (a, b, e, g)

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<th>Lecture Topics</th>
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<tr>
<td>Application layer</td>
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<td>Transport layer</td>
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<td>Link layer and local area networks</td>
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</table>

**Computer Usage**

- Medium

**Laboratory Experience**

- Medium

**Design Experience**

- None

**Coordinator**

- Carlos Pomalaza-Ráez, Ph.D.

**Date**

- January 14, 2017