Spring 2024

ECE 422-002: Computer Communication Networks

Mohammed Feknous

Course number and name ECE 422 - Computer Communications Networks

Credits, contact hours 3 credits, 3 contact hours

Name(s) of instructor(s) or coordinator(s) Mohammed Feknous

Instructional materials A. Leon-Garcia I. Widjaja, *Communication Networks*, McGraw-Hill, 2nd edition, ISBN-13 978-0-07-246352-1 (main text)

Specific course information
brief description of the content of the course (catalog description)

Introduction to the fundamental concepts of computer communication networks. Topics include the OSI reference model, the physical, data link, network, and transport layers, TCP/IP, LANs (including token ring, token bus, and ethernet), ALOHA, routing and flow control.

Prerequisites: ECE 321 or Math 333 Corequisite: none

Educational objectives for the course (e.g. The student will be able to explain the significance of current research about a particular topic.)

Student will be able to

1. define and recognize the basic elements of networks, and the different topologies.
2. know how to select the cabling format optimum for a specific case.
3. know and understand layering, the reasons for that concept, and the utilization of some interfacing devices such as bridges, switches, and routers.
4. be versed in TCP/IP, the original source for the layering concept.
5. recognize the characteristics of larger networks and their inherent requirements.
6. distinguish between all the sources of threat to networking, and how to circumvent them when possible.
7. discuss the need and formats of wireless communications in networking.
8. define and select among the many encoding techniques used to minimize errors in networking.
9. evaluate the merits of various routing algorithms.
10. Present in front of peers a practical implementation of the knowledge acquired in the course (implementation of servers, programming of routers suitable for a given application, and other topics of networking)

Brief list of topics to be covered

- Communication Network and Services

- Applications and Layered Architectures
- Digital Transmission Fundamentals
- TCP/IP
- Medium Access Control Protocols and Local Area Networks
- Packet-Switching Networks
- Peer-to-Peer Protocols and Data Link Layer
- Group project presentation