A. Course Description

Credits: 4

Prerequisites: ICS 240 Introduction to Data Structures AND MATH 215 Discrete Mathematics

Lab Hours/ Weeks: Corequisites: None

Lecture Hours/ Week :

MnTC Goals: None

Principles and practices of the OSI and TCP/IP models of computer networks, with special emphasis on the security of these networks. Coverage of general issues of computer and data security. Introduction to the various layers of network protocols, including physical, data link, network, and transport layers, flow control, error checking, and congestion control. Computer system strengths and vulnerabilities, and protection techniques: Topics include applied cryptography, security threats, security management, operating systems, network firewall and security measures. Focus on secure programming techniques. Programming projects.

B. Course Effective Dates: 08/17/2014 - Present

C. Outline of Major Content Areas:

See Course Description for major content areas.

D. Learning Outcomes (General)

1. Describe the high-level functions of, and interactions between, the protocol layers of network protocol stacks.
2. Explain the purpose and workings of the link, network, and transport layers in network protocol stacks, including the IP, TCP, and UDP protocols.
3. Evaluate the reliability and performance implications of different link, network, and transport layer protocols and solve quantitative problems involving these protocols.
4. Compare and contrast the protocols used in wireless and mobile networking with those used in traditional fixed-infrastructure networking.
5. Describe the goals of computer security to preserve confidentiality, integrity, and availability (CIA) of computer systems, and understand the threats to these goals.
6. Evaluate the role of cryptography in meeting threats to the CIA goals.
7. Evaluate the roles of operating system and network security measures in meeting threat to the CIA goals.
8. Introduce secure programming techniques to implement security measures.

E. Learning Outcomes (MN Transfer Curriculum)

This contains no goal areas.

F. Special Information

Note: Students are responsible to both be aware of and abide by prerequisites for ICS courses for which they enroll, and will be administratively dropped from a course if they have not met prerequisites.