CNT 6516 Advanced Computer Networking

Credits: 3 credits

Textbook, Title, Author, and Year: none

Reference Materials:
Academic research papers.

Specific Course Information

Catalog Description:
Covers advanced topics in computer networking, such as ad hoc wireless networks, cognitive networking, delay-tolerant networks and software defined networking. Students will understand the key mechanisms and networking protocols underlying these emerging networking architectures.

Prerequisites: CNT 4104 Introduction to Data Communications, or equivalent
C++ programming

Specific Goals for the Course:

1. Explain the key mechanisms of wireless networking involved at the physical, link and network layers of the protocol stack.

2. Compare the basic routing protocols designed for mobile ad-hoc networks.

3. Design simulation of wireless network scenarios with the ns3 simulator (optional).

4. Explain the fundamentals of the delay tolerant network architecture.

5. Explain the key mechanisms involved in cognitive radio and cognitive networking architectures.

6. Analyze the architecture foundations of software defined networking and virtual networks.

7. Understand and appreciate the role and operation of networking protocols.

Brief List of Topics to Be Covered:
Wireless Networking Recap
Delay Tolerant Networking
- Issues with TCP/IP
- DTN Architecture Foundations
- Routing in DTN

Issues in Cognitive Networking
- Spectrum Sensing and Dynamic Access
- Cognitive Networking Architectures
- Cognitive Networking Routing

Software-defined Networking and Network Virtualization
- SDN Fundamentals: a Case for the Control Plane
- SDN Network Architecture
- OpenFlow
- Network Virtualization and Cloud Computing