M.S. in Network Engineering and Management

Learning Outcomes

Students will be able to:

- List all TCP and IP header fields and describe the purpose of each, including their use in packet reception, IP prefix lookup, packet forwarding including layer 2 header generation, flow control, error control and congestion control.

- Write clear definitions of ARP, ICMP, DNS, RIP, OSPF, BGP and MPLS protocols and illustrate their use in protocol diagrams, including packet flows for each protocol.

- Connect devices (given a set of network devices, a network design and packet forwarding specification), configure IPv4 or IPv6 addressing and configure packet switching and routing using appropriate commands in Windows, MacOS, Linux and Cisco IOS operating systems.

- Write a clear definition of Quality-of-Service routing, including a clear description of the technologies (IP precedence, MPLS, RSVP) used to provide differentiated quality of service in IP networks.

- Clearly define and address network security threats and methods for ensuring confidentiality, integrity and availability, including security policies, encryption, authentication, access control, risk management and common defense methods.