Course: CET 4773: Inter-Networking Technologies
Course Coordinator: Prof. Benito Mendoza, PhD. **Revised on:** Spring 2020
Credits: 4 **This course is:** Required ☐Elective ☐ Selective Elective
Contact Hours: 6 **Class Hours:** 3 **Lab Hours:** 3 **Recitation Hours:** 0

Catalogue Description:
Technologies, protocols, and techniques used to connect a computer network with other networks through the use of gateways that provide a common method of routing information packets among the networks. Internet technologies for the connection of computing devices with other internal and external devices or systems. Topics include Local Area Networks (LAN) and Wide Area Networks (WAN) implementation, wireless networks implementation, network security, advanced switching and routing configuration, advanced TCP/IP configuration, and network management..

Pre-Requisites: CET 3510
Co-Requisites: None

Required Texts [Title. Authors. Publisher. Year.]
1. **Routing and Switching Pro**. TestOut. TestOut. 2016. ISBN#: 978-1-935080-55-8

Other Suggested Reference or Supplemented Material
2. **CCNA Routing and Switching 200-125 Official Cert Guide Library**. Wendell Odom. Cisco Press. 2016

Course Learning Outcomes

Upon successful completion of this course, the student will be able to:
1. Describe how networks function, identifying major components, function of network components, and the OSI reference model.
2. Setup and configure switches and routers including interface configuration.
3. Configure network connectivity, including device IP settings configuration and routing protocols.
4. Design and configure network access, including configuration of switch VLANs, interVLAN routing, spanning tree, and EtherChannel.
5. Understand network IP services, including configuration of NAT, DHCP, DNS proctocols.
6. Configure router and switching security, including access control lists and port security.

General Education Outcomes

INTEGRATION/Systems: Understand and navigate systems
SKILLS/Communication: Communicate in diverse settings and groups, using written (both reading and writing)
SKILLS/Inquiry/Analysis: Use creativity to solve problems.

Student Outcomes listed in the ETAC/ABET Criterion 3 Addressed in this Course	Level
(1) An ability to apply knowledge, techniques, skills and modern tools of mathematics, science, engineering, and technology to solve broadly-defined engineering problems appropriate to the discipline;	R
(2) An ability to design systems, components, or processes meeting specified needs for broadly-defined engineering problems appropriate to the discipline;	R
(3) An ability to apply written, oral, and graphical communication in broadly-defined technical and non-technical environments; and an ability to identify and use appropriate technical literature;	R
(4) An ability to conduct standard tests, measurements, and experiments and to analyze and interpret the results to improve processes; and	R
(5) An ability to function effectively as a member as well as a leader on technical teams.	R

ETAC/ABET Program Criteria: Computer Engineering Technology	Level
a. The ability to analyze, design, and implement hardware and software computer systems.	R
b. The ability to apply project management techniques to computer systems.	
c. The ability to utilize statistics/probability, transform methods, discrete mathematics, or applied differential equations in support of computer systems and networks.	

***Legend**: I (Introduce), R (Reinforce) and E (Emphasize). Unmarked means not addressed*

Brief list of topics to be covered

Week 1	**CUNY Academic Integrity Policy, Course Syllabus and Policies, Certifications Exams** **Module 1. Module 2. Networking Concepts**: Network Devices, TCP/IP Networking Model
Week 2	**Module 2. Networking Concepts**: Data Encapsulation, OSI Networking Model, Ethernet
Week 3	**Module 3 – IPv4 Addressing:** IPv4 Address Classes, Subnetting
Week 4	**Module 4 – IPv6 Addressing:** IPv6 Addressing Overview, IPv6 Host Configuration **Module 5 - Cisco Devices Basics:** System Startup, Command Line Interface (CLI)
Week 5	**Module 5 - Cisco Devices Basics:** Basic Device Settings, Device Passwords, Network Communications Troubleshooting
Week 6	**Module 6 – Lan Switching:** Layer 2 Switching Overview, Interface Configuration, VLANs
Week 7	**Module 6 – Lan Switching:** Trunking, Switch Security, Remote Switch Access, Cisco Discovery Protocol (CDP), Switch Troubleshooting
Week 8	**Mid-Term Exam** **Module 7 –IP Routing Technologies:** IPv4 Routing, Routing Implementations, Static Routing
Week 9	**Module 7 –IP Routing Technologies:** Route Summarization, IPv6 Routing, InterVLAN Routing Overview, InterVLAN Routing Configuration
Week 10	**Module 8 – IP Services:** DHCP, ACLs, Network Address Transaltion (NAT)
Week 11	**Module 8– IP Services:** NAT Configuration, Network Time Protocol (NTP) **Module 9 –Device Configuration and Management:** Router Configuration Files, NetFlow
Week 12	**Module 11 –Advanced Switching:** Advanced Trunking, Spanning Tree Protocol
Week 13	**Module 12 – Advanced Routing:** Dynamic Routing, Layer3 InterVlan Routing, Default Gateway Redundancy, IPv6 and Extended IPv4 ACLs, IPv6 and Extende ACL Configuration
Week 14	**Module 13– Wide Area Networks:** WAN Types, PPP and Multi PPP, Virtual Private Networks **Module 14 – IPv4 Routing Protocols:** Open Shortest Path First (OSPF), OSPF for IPv4, OSPF Configuration
Week 15	**Final Exam**