ITEC350: Introduction to Computer Networking – Fall 2020

MWF 10:00~10:50AM (Online)
Zoom Link: https://radford.zoom.us/j/92072089536
Password: 154195

Instructor: Dr. Hwajung Lee
Email: hlee3@radford.edu
Office Hours: MWF 12-1PM; Thur 11AM-1PM; and by appointment

Required Textbook:

This class has no required textbook.

Evaluation:

Activity	Percent
Midterm Exam	20%
Final Exam	20%
Quizzes & Activities	20%
Homework	5%
Cisco Networking Academy Course ▪ Reading Assignments & Chap Exams ▪ Pass Certificate Exam	 10% 25%
Total	**100%**
Perfect Attendance and Full Attention in Class (bonus)	**Bonus 3%** of the average of your earned exam scores

NOTE 1: If you attend 100% of the classes and give me your **full attention** in class with your zoom video on, I will add 3% of the average of your earned exam scores on top of yours at the end of the semester.

NOTE 2: **If you absence more than 6 lectures, you will get an F of this class**. Late 3 times in lecture sessions is equivalent to 1 absence. If you late more than 15 minutes, it will be considered as an absence.
As an attendance check, I will ask you to type "1" in the chat window at the beginning of each class. If you are late, please type "1" in the chat window right after you join the zoom lecture.

NOTE 3: **I will not accept late assignments.**

Honor Code:

By accepting admission to Radford University, each student makes a commitment to understand, support, and abide by the University Honor Code without compromise or exception. Violations of academic integrity will not be tolerated.   This class will be conducted in strict observance of the Honor Code. Refer to your Student Handbook for details. In this class the student is expected to do all out of class assignments on their own. All violations will be reported. **All assignments are to be done independently unless I specifically say otherwise.**

Special Assistance:

Students seeking academic accommodations under the Americans with Disabilities Act must register with the Center for Accessibility Services (CAS) to determine eligibility. Students qualified for academic accommodations will receive accommodation letters and should meet with each course professor during office hours, to review and discuss accommodations. For more information, call 540-831-6350 or visit http://www.radford.edu/content/cas/home.html.

Topics include:

1. Introduction
    a. Reasons for networking
    b. Concept and rationale for network layers

  c. Classification of networks: BAN (body area networks), PAN (personal area networks), LAN (local area networks), MAN (metropolitan area networks), WAN (wide area networks), and Internet

  d. Network standards and standard bodies

2. Applications and Layered Architectures
  a. Protocols, services, and layering
  b. ISO's OSI (open systems interconnection) reference model
  c. TCP/IP (Transmission Control Protocol/Internet Protocol) protocol stacks
  d. DNS (Domain Name Systems)
  e. IP addressing and subnetting
  f. Connectionless vs. connection-oriented services
  g. Segmentation and reassembly
  h. Multiplexing:
    i. FDM (frequency division multiplexing)
    ii. TDM (time division multiplexing)
    iii. WDM (wavelength division multiplexing)
  i. Network analyzers

3. Digital Transmission Fundamentals
  a. Line Coding
    i. unipolar NRZ (non-return-to-zero)
    ii. polar NRZ, NRZ-inverted differential encoding, bipolar encoding
    iii. Manchester encoding, differential Manchester encoding
  b. Error detection and correction
    i. single parity bit
    ii. multi-dimensional parity check
    iii. CRC (cyclic redundancy check) polynomial codes

4. Peer-to-Peer Protocols and Data Link Layer
  a. ARQ (Automatic Repeat Request) protocols and reliable data transfer
    i. stop-and-wait ARQ
    ii. go-back N ARQ
    iii. selective repeat ARQ
    iv. sliding window protocols

5. Medium Access Control Protocols and Local Area Networks

6. Packet-Switching Networks
  a. Routing in packet-switching networks
    i. centralized vs. distributed routing
    ii. static vs. dynamic routing
    iii. flat vs. hierarchical routing,
    iv. flooding
  b. Shortest path routings:
    i. distance vector protocols (Bellman-Ford-Fulkerson shortest path algorithm)
    ii. link state protocols (Dijkstra shortest path algorithm)

7. Communication Networks and Services
  a. IRP (internet routing protocols)
    i. RIP (routing information protocol)
    ii. OSPF (open shortest path first)
    iii. BGP (border gateway protocol)
  b. DHCP (dynamic host configuration protocol)
  c. NAT (network address translation)

8. Security Basics