1. **Course number and name**
   ENGR 476: Computer Communication and Networks

2. **Credits and contact hours**
   3 credit hours; one 100-minute lecture session/week and one 2-hour-45-minute lab session/week

3. **Instructor’s or course coordinator’s name**
   Instructor: Hamid Shahnasser, Professor of Electrical and Computer Engineering
   Course coordinator: Hamid Shahnasser, Professor of Electrical and Computer Engineering

4. **Text book, title, author, and year**
   
   a. other supplemental materials
      Arista Networks User Manual

5. **Specific course information**
   a. **brief description of the content of the course (catalog description)**
      The course will cover OSI reference model, Ethernet, Frame Relay, ATM, and SONET topics, TCP/IP, DNS, HDLC (High-level Data Link Control) protocol and Routing algorithms. ARP (Address Resolution Protocol) and Ethernet protocol. LACP (Link Aggregation Control Protocol), MLAG (Multichassis Link Aggregation), ACL (Access Control Lists)
   b. **prerequisites or co-requisites**
      ENGR 356, ENGR 213 or CSC 210; all with a grade of C- or better
   c. **indicate whether a required, elective, or selected elective course in the program**
      Required for Computer Engineering; elective for Electrical Engineering.

6. **Specific goals for the course**
   a. **specific outcomes of instruction, ex. The student will be able to explain the significance of current research about a particular topic.**
      - Student will learn various local area network protocols
      - Student will learn the wide area networking protocols and technologies
      - Student will learn about the Transmission Control Protocol/Internet Protocol
      - Student will learn about Internetworking devices such as bridges and route
      - The student will demonstrate an ability to solve problems related to High-level Data link control (HDLC) and routing algorithms.
      - The student will demonstrate an ability to analyze ARP (Address Resolution protocol) and Ethernet protocols.
      - The student will demonstrate a skill in using software tools such as Wireshark for network traffic monitoring and debugging.
• The student will demonstrate knowledge LACP protocol used in the data link layer of the OSI model.
• The student will demonstrate the skill of connecting two or more physical links on multiple switches into a single logical link.
• The student will demonstrate a working knowledge of Access Control Lists

b. explicitly indicate which of the student outcomes listed in Criterion 3 or any other outcomes are addressed by the course.
Course addresses ABET Student Outcome(s): a, b, c, e, k.

7. Brief list of topics to be covered
In class:
• Background Review: OSI Model, Transmission and Media
• IEEE 802.3 Ethernet local area network
• Network Layer: Logical Addressing, Address mapping, Error reporting
• Virtual circuit networks: Frame Relay and Asynchronous Transfer Mode (ATM)
• Synchronous Optical Network (SONET/SDH)
• Transmission Control Protocol/ Internet Protocol (TCP/IP)
• Domain Name System (DNS)

In Lab:
• HDLC (High-level Data Link Control)
• Routing Algorithms
• Introduction to Wireshark
• ARP (Address Resolution Protocol)
• Ethernet Protocol
• Intro to Arista-7050T Switches
• Link Aggregation Control Protocol (LACP)
• Multichasssis Link Aggregation (MLAG)

Access Control Lists (ACL)