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, c, e, b, 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)
   • Multichassis Link Aggregation (MLAG)
   • Access Control Lists (ACL)