1. **Course number and name**
   EE/CptS 455: Introduction to Computer Networks

2. **Credits and contact hours**
   3 credits, 3 lecture hours

3. **Instructor’s or course coordinator’s name**
   Adam Hahn

4. **Textbook, title, author, and year**

   **Other supplemental materials**
   Instructor notes/slides and various papers/websites will be provided for some topics.

5. **Specific course information**
   a. **Catalog description:** Concepts and implementation of computer networks; architectures, protocol layers, internetworking and addressing case studies.
   b. **Prerequisites or corequisites:** CptS 360 with a C or better, or EE 234 with a C or better; certified major in Computer Science, Computer Engineering, or Electrical Engineering.

6. **Specific goals for the course**
   By the end of the course, students will be able to
   - Assess the performance of computer networks based on time (latency) and throughput (1a, 1b, 1c, 1d).
   - Analyze network operations requirements to determine the protocols (e.g., Ethernet, IP, IPv6, TCP, UDP, DNS, BGP, HTTP) necessary for end-to-end packet delivery for various applications (1a, 1b, 1c, 1d, 1e).
   - Design and develop TCP/IP based programs to communicate over unreliable networks using socket APIs (2a, 2b, 2c, 2g).
   - Implement algorithms to provide quality of service and network multiplexing, including routing, network access, congestion control, and resource allocation (2a, 2b, 2c, 2g).
   - Apply new technologies, such as software-defined networks (SDN), to solve existing network challenges (7a, 7f, 7g).

7. **Brief list of topics to be covered**
   - Network performance metrics
   - Network programming/sockets
   - Network models (TCP/IP, OSI)
   - Error detection/correction
   - Addressing (Ethernet, IPv4, IPv6)
   - Network layer protocols (ARP, ICMP)
● Switching/forwarding
● Routing algorithms (BGP, OSPF)
● Transport protocols (UDP, TCP)
● Reliability (Sliding Window, ARQ)
● Congestion control algorithms
● Application protocols (DNS, HTTP, SMTP)
● Security (IPsec, TLS)
● Software defined networks