1. **Course number and name**
    COE 371 – Computer Networks I

2. **Credits and contact hours**
    3 credit hours, 5 contact hours

3. **Instructor's or course coordinator's name**
    Dr. Taha Landolsi

4. **Textbook, title, author, and year**
    J. Kurose, K. Ross, *Computer Networking: A Top-Down Approach,* 6th edition. Pearson, 2012.

    Other supplemental materials
    None

5. **Specific course information**
    a. **Brief description of content of the course (catalog description)**
        Provides an overview of computer networks and the Internet, application layer services and protocols, transport layer services, principles of flow and congestion control, network layer addressing, forwarding, and routing, link layer protocols, addressing and multiple access, computer networks security.

    b. **Prerequisites or co-requisites**
        Prerequisites: COE 221/CMP 210 (Digital Systems) and MTH 104 (Calculus II)

    c. **Indicate whether a required, elective, or selected elective course in the program**
        Required

6. **Specific goals for the course**
    a. **Specific outcomes of instruction**
        This course requires the student to demonstrate the following:
        1. Describe the application layer protocols HTTP, FTP, and SMTP
        2. Describe DNS service and identify its records and messages
        3. Describe TCP and UDP segment structures and principles of operation
        4. Identify IPv4 datagram format and interpret its fields
        5. Assign appropriate IP addresses to a given network design
        6. Generate a routing table for a network using distance-vector (e.g. RIP) and link state routing (e.g. OSPF) algorithms
        7. Describe the data link layer addressing and the functions of ARP protocol
        8. Understand WAN networks technologies such as ATM, FR
        9. Understand wireless LAN technologies such as IEEE 802.11
        10. Understand the principles of cryptography, authentication, and message integrity
        11. Describe security in application, transport, network, and link layers

12. Design a small-size network; configure network elements (e.g. Hosts, routers/switches, firewalls, APs), configure various network services, and perform network testing and monitoring.

b. Explicitly indicate which of the student outcomes listed in Criterion 3 or any other outcomes are addressed by the course

This course contributes in a significant way to the accomplishment of the following program outcomes:

Program outcome	Emphasis in this course
(a) an ability to apply knowledge of mathematics, science, and engineering	◑
(b) an ability to design and conduct experiments, as well as to analyze and interpret data	◑
(c) an ability to design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability	
(d) an ability to function on multidisciplinary teams	
(e) an ability to identify, formulate, and solve engineering problems	●
(f) an understanding of professional and ethical responsibility	
(g) an ability to communicate effectively	
(h) the broad education necessary to understand the impact of engineering solutions in a global, economic, environmental, and societal context	◑
(i) a recognition of the need for, and an ability to engage in life-long learning	○
(j) a knowledge of contemporary issues	◑
(k) an ability to use the techniques, skills, and modern engineering tools necessary for engineering practice.	●

Emphasis: ● High; ◑ Medium; ○ Low; Blank – Nothing Specific Expected

7. Brief list of topics to be covered
   i.   Application layer
   ii.   Transport layer
   iii. Network layer
   iv.   VC network technology
   v.   Computer network security