University/Academy: Arab Academy for Science, Technology & Maritime Transport
Faculty/Institute: College of Engineering & Technology
Program: B.Sc Computer Engineering

Form no. (12): **Course Specification**

1- Course Data

Course Code: **CC331**	Course Title: **Data and Computer Communications**	Academic Year/Level: year **3** / semester **6**
Specialization: **Computer Engineering**	**Credit Hours**: 3 **Lecture**: 2 **Tutorial:** 2 **Lab:** 2	**Prerequisite** EC320

2- Course Aim

To provide a unified view of the broad field of computer networks. Also to emphasize basic principles and topics of fundamental importance concerning the applications, architecture, design issues and standard of computer networks

3- Intended Learning Outcomes

a- Knowledge and Understanding	A1. Concepts and theories of mathematics and sciences, appropriate to the computer engineering. A2. Basics of information and communication technology (ICT). A3. Methodologies of solving engineering problems, data collection and interpretation. • Define a computer Network. • Define protocol. • Summarize computer network motivation • Understand the layered architecture. • Describe OSI reference Model (Theoretical Model) • Distinguish between various encoding techniques • Identify characteristics of different transmission media • Understand the difference between Frequency division multiplexing and time division multiplexing • Show Circuit Switching and datagram packet switching • Calculate end-to-end delay and Throughput • Understand Principles of Network applications and network protocols developed for application layer. • Understand transport layer protocols • Differentiate between TCP and UDP • Understand difference between forwarding and routing • Summarize addressing in IPv4, IPv6 • Define the difference between different types of mobile network: infrastructure one and mobile ad hoc networks
b- Intellectual Skills	B1. Select/Apply appropriate mathematical and computer-based methods for modeling and analyzing problems and select appropriate solutions for engineering problems based on analytical thinking. • Calculate utilization for each flow control technique • Calculate efficiency of Ethernet. B2. Think in a creative and innovative way in problem solving and design using the latest technologies and solve engineering problems, often on the basis of limited and possibly contradicting information while identifying symptoms in problematic situations. B4.Assess and evaluate the characteristics and performance of components, systems and processes and investigate their failure. • Analyze the channel capacity in case of noise or error free channel • Analyze performance of computer networks

c- Professional Skills	C2. Create and/or re-design a process, component or system, and carry out specialized engineering designs with neatness and aesthetics in design and approach. • Choose among different transmission media (Coaxial cable, twisted pair, optical fiber) when designing and establishing new computer networks • Select between FDM and TDM and Knowing the circuit requirement to achieve each of these two techniques • Develop congestion control techniques C3. Use computational facilities and techniques, measuring instruments, workshops and laboratory equipment, wide range of analytical tools, techniques, and software packages pertaining to the computer engineering to design experiments, collect, analyze and interpret results and develop required computer programs. • Calculate throughput of designed and established computer network • Choose between UDP and TCP according to application developed • Set IP address for designed and newly established computer network • Manipulate switches • Perform Mobility management
d- General Skills	D2.Work in stressful environment and within constraints, communicate effectively, lead and motivate individuals and effectively manage tasks, time, and resources. • Verift theory with practice

4- Course Content

Week No.1	Introduction to Computer Networks.
Week No.2	Protocols and Architectures
Week No.3	Data Transmission, transmission media & Data Encoding
Week No.4	Multiplexing & Switching techniques.
Week No.5	Performance metrics in Networks.
Week No.6	Application Layer
Week No.7	7th Week Exam + Revision
Week No.8	Transport Layer
Week No.9	Transport Layer
Week No.10	Network Layer
Week No.11	Network Layer
Week No.12	12th Week Exam +Revision.
Week No.13	Data Link Layer & LAN
Week No.14	Data Link Layer & LAN
Week No.15	Introduction to either Wireless & Mobile Networks or Multimedia Networking
Week No.16	Presentation of projects and Final Exam.

5- Teaching and Learning Methods

- Lectures
- Tutorials
- Reports & sheets
- Laboratories
- Seminars

6-Teaching and Learning Methods for Students with Special Needs

• Lectures • Tutorials • Reports & sheets • Laboratories • Seminars The academic advisors of each student, as well as dedicated department TAs monitor the students' progress and solve any problem he/she may encounter.

7- Student Assessment

a-Procedures used	1-Written Examinations to assess The Intended Learning Outcomes. 2-Class Activities (Reports, Discussions, ------) to assess The Intellectual Skills.	
b- Schedule:	Assessment 1 Assessment 2 Assessment 3 Assessment 4	7th Week Written Exam 12th Week Written Exam Continuous Assessments 16th Week Final Written Exam
c- Weighing of Assessment	7th Week Examination 12th Week Examination Final-term Examination Oral Examination Practical Examination Semester Work Total	30 % 20 % 40 % 0 % 5 % 5 % 100%

8- List of References:

a- Course Notes	
b- Required Books (Textbooks)	Stallings, William, "Data and Computer Communications (1588)", Prentice-Hall, Inc 8ED
c- Recommended Books	• Data and Computer Communications, W. Stallings, 7/Ed, Prentice Hall. • Tanenbaum, A. S. Computer Networks , 3/Ed, Prentice Hall
d- Periodicals, Web Sites, etc.	N/A

Course Instructor:
Assoc. Prof. Dr.Sherin Youssef

Program Manager:
Prof. Dr. Mohamad AbouEl-Nasr

Dean of College of Engineering and Technology of AASTMT

Name: **Prof. Moustafa Hussein Aly**

Signature:

Executive Manager of Quality Assurance Center of AASTMT

Name: **Prof. Aziz Ezzat**

Signature: