Course Specification

(Bachelor)

Course Title:	Data Transmission and Computer Networks
Course Code:	IT 324
Program:	IT
Department:	IT
College:	College of Computer and Information Sciences
Institution:	Majmaah University
Version:	2
Last Revision Date:	31 May 2022

Table of Contents

A. General information about the course:

1. Course Identification

1. Credit hours: 3(3,0,1)					
2. Course type					
A.	☐University	☐College	☒ Department	☐Track	☐Others
B.	☒ Required		☐Elective		
3. Level/year at which this course is offered: (6)					
4. Course general Description: This course aims to provide a theoretical as well as experimental background of Computer Network with a focus on the following: Introduction to computer networks, Network architecture, OSI reference model, Transmission media, Transmission Impairments, Data encoding; Data Link: Error Detection, Medium Access control Protocols and standards, MAC Addressing, Link layer Switches, LAN standards & Devices: Ethernet and IEEE standards for LANs, Wireless networks; Network Layer: Virtual circuit and Datagram Networks, Router Structure, The Internet Protocol (IP), Routing Algorithms, Broadcasting and Multicasting; Transport Layer: TCP and UDP services, designs, and performance, Principles of Reliable Data Transfer; Application layer: The Web and HTTP, FTP, Electronic Mail, and DNS.					
5. Pre-requirements for this course (if any)**:**					
CS 231					
6. Pre-requirements for this course (if any)**:**					
7. Course Main Objective(s): This course introduces students to evolution trend of computer networks. It also helps students in understanding the procedure of					

transmitting data over the network. This course provides with practical knowledge and hands-on experience in transmitting data over the network.

2. Teaching mode (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	Traditional classroom	60	100
2	E-learning		
3	Hybrid • Traditional classroom • E-learning		
4	Distance learning		

3. Contact Hours (based on the academic semester)

No	Activity	Contact Hours
1.	**Lectures**	45
2.	**Laboratory/Studio**	
3.	**Field**	
4.	**Tutorial**	15
5.	**Others (specify) Review**	
Total		60

B. Course Learning Outcomes (CLOs), Teaching Strategies and Assessment Methods

Code	Course Learning Outcomes	Code of CLOs aligned with program	Teaching Strategies	Assessment Methods
1.0	**Knowledge and understanding**			
1.1				
1.2				
...				
2.0	**Skills**			

Code	Course Learning Outcomes	Code of CLOs aligned with program	Teaching Strategies	Assessment Methods
2.1	CLO1:Understand and analyze the structure of an abstract layered protocol model (OSI, TCP/IP) and Transmission Media	S1	Classroom Teaching	Class Test, Mid Exam, Final Exam
2.2	CLO2:Understand and implement data link (DL) layer protocols	S2	Classroom Teaching	Class Test, Mid Exam, Lab based Assignments, Final Exam, Mini Project
2.3	CLO3:Understand the principles of Network Layer Services and implement principles of Delivery, Forwarding	S3	Classroom Teaching Mini Project, Lab Exercises	Class Test, Mid Exam, Lab based Assignments Final Exam Oral or Written Communication, Seminar
2.4	CLO4:Understand and implement the principles Routing	S5	Classroom Teaching Mini Project, Lab Exercises	Class Test, Mid Exam, Lab based Assignments Final Exam Group Assignments, Mini Project
2.5	CLO5:Understand principles of Transport Layer Services & design principles of Transport Protocols (UDP & TCP) and application layer services	S3	Classroom Teaching Mini Project, Lab Exercises	Class Test, Mid Exam, Final Exam, Lab based Assignments, Mini Project
3.0	**Values, autonomy, and responsibility**			
3.1				

Code	Course Learning Outcomes	Code of CLOs aligned with program	Teaching Strategies	Assessment Methods
3.2				

C. Course Content

No	List of Topics	Contact Hours
1.	Introduction to computer networks, Network architecture, OSI reference model	4
2.	Transmission media, Transmission Impairments	4
3	Data encoding; Data Link Control Protocol: Error Detection	6
4	Medium Access control Protocols and standards ,MAC Addressing	6
5	Link layer Switches, LAN standards & Devices, Ethernet and IEEE standards for LANs	6
6	Network Layer: Virtual circuit and Datagram Networks	6
7	Router Structure, The Internet Protocol (IP), Routing Algorithms Broadcasting and Multicasting	6
8	Transport Layer: TCP and UDP services	6
9	Designs, and performance of TCP, Principles of Reliable Data Transfer	6
10	Application layer Protocol: The Web and HTTP	6
11	Review	4
	Total	**60**

D. Students Assessment Activities

No	Assessment Activities *	Assessment timing (in week no)	Percentage of Total Assessment Score
1	**Midterm Examination:**	**Week 7**	**20%**
2	**Final Examination**	**Week 15**	**40%**
3	**Class Test (2)**	**Week 4 /8**	**10%**
4	**Homework/assignments**	**(as per schedule)**	**10%**
5	**Exercises/Miniproject/Lab Based Assignments**	**(as per schedule)**	**20%**
	Total		100%

*Assessment Activities (i.e., Written test, oral test, oral presentation, group project, essay, etc.).

E. Learning Resources and Facilities

1. References and Learning Resources

Essential References	**Data Communications and Networking: With TCP/IP Protocol Suite, 6th Edition, Behrouz A. Forouzan, McGraw- McGraw-Hill, 2021**
Supportive References	**Tanenbaum, Computer Networks, 5th Edition, Prentice Hall, 2010.** **James F. Kurose, and Keith W Ross, Computer Networking: A Top-Down Approach, Addison-Wesley, 2012.** **Larry Patterson and Bruce Davis, Computer Networks: A systems Approach, Morgan Kaufmann, 2011.**
Electronic Materials	**http://nptel.ac.in/courses.php?disciplineId=106** **http://ocw.mit.edu/courses**
Other Learning Materials	**ns-3 is a discrete-event network simulator** **https://www.nsnam.org/** **OPNET Network Simulator**

2. Required Facilities and equipment

Items	Resources
facilities (Classrooms, laboratories, exhibition rooms, simulation rooms, etc.)	Classroom, Network Lab
Technology equipment (projector, smart board, software)	PC or Laptop with Windows/Linux, Smart Board, Projector
Other equipment (depending on the nature of the specialty)	Internet Connection

F. Assessment of Course Quality

Assessment Areas/Issues	Assessor	Assessment Methods
Effectiveness of teaching	Indirect (Students)	CLO Survey
Effectiveness of Students assessment	Direct (Instructor)	Quiz, Mid exam, Assignments, Exercises, Final Exam and Indirect Survey

Assessment Areas/Issues	Assessor	Assessment Methods
Quality of learning resources	Convener, instructors, HOD	Regular follow ups
The extent to which CLOs have been achieved		
Other		

Assessors (Students, Faculty, Program Leaders, Peer Reviewer, Others (specify)

Assessment Methods (Direct, Indirect)

G. Specification Approval

COUNCIL /COMMITTEE	**IT DEPARTMENT**
REFERENCE NO.	
DATE	