



Course Specification

— (Bachelor)

Course Title: Data Communications and Computer Networks

Course Code: CENX 303

Program: B.S. in Computer Engineering

Department: Department of Computer Engineering

College: College of Computer and Information Sciences

Institution: King Saud University

Version: Course Specification Version Number

Last Revision Date: Pick Revision Date.

Table of Contents

A. General information about the course:	3
B. Course Learning Outcomes (CLOs), Teaching Strategies and Assessment Methods	4
C. Course Content	5
D. Students Assessment Activities	6
E. Learning Resources and Facilities	6
F. Assessment of Course Quality	6
G. Specification Approval	7





A. General information about the course:

1. Course Identification

1. Credit hours: (3 hours)

2. Course type

A. ☐ University ☒ College ☐ Department ☐ Track ☐ Others
B. ☒ Required ☐ Elective

3. Level/year at which this course is offered: (Level 7)

4. Course general Description:

This course introduces the student to various protocols and technologies used in all layers except the physical of computer networks. Specifically, it covers the following aspects: Introduction To Communication Systems and Computer Networks: Network Essentials, Features, Models, and Components, Classification Of Telecommunication and Computer Networks and Internet Technology; Overview Of Computer Networks and Protocols (OSI) And (TCP/IP) Protocols; Application Layer: Protocols, Client-Server / P2P Architectures, Web and HTTP Protocol, File Transfer and FTP Protocol, Electronic Mail and SMTP & POP3/IMAP Protocols, DNS; Transport Layer: Services, Multiplexing and Demultiplexing, Data Transfer Reliability, Flow Control, Congestion Control, TCP, UDP Transport Protocols, and socket programming; Network Layer: Routing and Routers, The IP Protocol, Routing Algorithms (LS, DV, ...), Routing In The Internet (RIP, OSPF, BGP), Broadcast and Multicast Routing; Introduction To Network Security; Overview of data Link Layer and wireless communication;

5. Pre-requirements for this course (if any):

STAT 324 – Engineering Probability and Statistics

6. Co-requirements for this course (if any):

7. Course Main Objective(s):

This course provides students with basic knowledge of various layers starting from the application layer to the data link layer the OSI and TCP/IP reference models.

2. Teaching mode (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	Traditional classroom	4 hours per week	100%
2	E-learning		
3	Hybrid		



No	Mode of Instruction	Contact Hours	Percentage
	- 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)	
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	Describe the concept of layered architecture (OSI and TCP/IP Reference Model).	1	Lectures and Tutorials	Exams and Homework
1.2	Describe the distinctive roles and services of Application layer: client-server / P2P architectures, HTTP, FTP, SMTP and POP3/IMAP protocols, and DNS.	4	Lectures and Tutorials	Exams and Homework
1.3	Describe the services and roles of the transport layer: data transfer reliability, flow and congestion control, TCP and UDP protocols.	4	Lectures and Tutorials	Exams and Homework
1.4	Describe the distinctive services, algorithms and protocols of the network layer: routing and forwarding, the IP protocol, routing Algorithms.	4	Lectures and Tutorials	Exams and Homework



Code	Course Learning Outcomes	Code of CLOs aligned with program	Teaching Strategies	Assessment Methods
2.0	Skills			
2.1	Demonstrate an understanding of socket programming implementation.	7	Lectures and Tutorials	Exams and Homework
2.2	Demonstrate an understanding of the fundamental concepts and functions of data link and wireless communication.	2	Lectures and Tutorials	Exams and Homework
2.3	Demonstrate an understanding of the fundamental concepts of network security.	2	Lectures and Tutorials	Exams and Homework
3.0	Values, autonomy, and responsibility			
3.1				

C. Course Content

No	List of Topics	Contact Hours
1.	Introduction To Communication Systems and Computer Networks: Network Essentials, Features, Models, and Components, Classification of Telecommunication and Computer Networks and Internet Technology; Overview Of Computer Networks and Protocols (OSI) And (TCP/IP) Protocols;	8
2.	Application Layer: Protocols, Client-Server / P2P Architectures, Web and HTTP Protocol, File Transfer and FTP Protocol, Electronic Mail and SMTP & POP3/IMAP Protocols, DNS;	14
3.	Transport Layer: Services, Multiplexing and Demultiplexing, Data Transfer Reliability, Flow Control, Congestion Control, TCP, UDP Transport Protocols, and socket programming	10
4.	Network Layer: Routing and Routers, The IP Protocol, Routing Algorithms (LS, DV, ...), Routing In The Internet (RIP, OSPF, BGP), Broadcast and Multicast Routing;	10
5.	Overview of data Link Layer and wireless communication;	10
6.	Introduction To Network Security;	4
7.	Review and evaluation	4
Total		60



D. Students Assessment Activities

No	Assessment Activities *	Assessment timing (in week no)	Percentage of Total Assessment Score
1.	Midterm Examination (1)	7	25%
2.	Midterm Examination (2)	12	25%
3.	Homework Assignments	Weekly	10%
4.	LAB experiment reports	NA	NA
5.	Final Exam	16	40%

*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	Computer Networking: A Top-Down Approach, J. Kurose and K. Ross, Pearson, 7 th edition. ISBN-10: ISBN 0133594149.
Supportive References	Computer Networks, A. Tanenbaum, Pearson. ISBN-10: 0-13-212695-8.
Electronic Materials	https://lms.ksu.edu.sa http://williamstallings.com/DataComm/DCC10e-Student/
Other Learning Materials	

2. Required Facilities and equipment

Items	Resources
facilities (Classrooms, laboratories, exhibition rooms, simulation rooms, etc.)	Lecture room with number of seats enough to accommodate enrolled students.
Technology equipment (projector, smart board, software)	Overhead projector with required software to facilitate presentations on smart board.
Other equipment (depending on the nature of the specialty)	

F. Assessment of Course Quality

Assessment Areas/Issues	Assessor	Assessment Methods
Effectiveness of teaching	Department Council	Course reports are evaluated by the Department Council.
Effectiveness of Students assessment	Faculty-Peer Review	Final examination is moderated.
Quality of learning resources	Students	Indirect – Edu-gate survey.

Assessment Areas/Issues	Assessor	Assessment Methods
The extent to which CLOs have been achieved	Students	Attainment level of every CLO is measured directly.
Other		

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

Assessment Methods (Direct, Indirect)

G. Specification Approval

COUNCIL /COMMITTEE	
REFERENCE NO.	
DATE	

