



Course Specification

— (Bachelor)

Course Title: **Network Design**

Course Code: **CS1767**

Program: **Computer Science**

Department: **Computer Science and Engineering**

College: **Computer Science and information technology**

Institution: **Albaha University**

Version: **V1**

Last Revision Date: **October 2023**



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	7
G. Specification Approval	8



A. General information about the course:

1. Course Identification

1. Credit hours: (3)

2. Course type

A. University College Department Track Others
 B. Required Elective

3. Level/year at which this course is offered: (10 / 4th year (Elective))

4. Course general Description:

Lecture:

This course prepares students to design and manage various aspects of organizational network. Coverages include Business goals and constraints Analysis, Top-Down network design methodology, existing internetwork characterization, network topology design, addressing and numbering model, routing protocols selection, network security strategies, network management strategies, technologies and devices for enterprise networks, network design testing and optimization.

Lab:

The lab covers the logical and physical design of the network using network simulator software such as Packet Tracer and measure the design performance. As for network management, the lab focuses on Campus architecture.

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

Wireless Networks (CS1762)

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

7. Course Main Objective(s):

The main objective of this course is to prepare students to design and manage various aspects of organizational network

2. Teaching mode (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	Traditional classroom	44	100%
2	E-learning		
3	Hybrid		





No	Mode of Instruction	Contact Hours	Percentage
	<ul style="list-style-type: none"> Traditional classroom E-learning 		
4	Distance learning		

3. Contact Hours (based on the academic semester)

No	Activity	Contact Hours
1.	Lectures	22
2.	Laboratory/Studio	22
3.	Field	
4.	Tutorial	
5.	Others (specify)	
Total		44

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	Outline the network design process and internetworking characteristics	K1	<ul style="list-style-type: none"> Lectures Slide Presentations Multimedia Presentations 	<ul style="list-style-type: none"> Homework/Assignments Midterm Exam Final Exam
1.2	Describe technologies and devices for enterprise networks	K2	<ul style="list-style-type: none"> Lectures Slide Presentations Multimedia Presentations Debates/Discussion 	<ul style="list-style-type: none"> Homework/Assignments Midterm Exam Final Exam
2.0	Skills			
2.1	Design different network topologies and physical networks	S2	<ul style="list-style-type: none"> Demonstrations Debates/Discussions Labs Lectures Group Discussion 	<ul style="list-style-type: none"> Homework/Assignments Lab Evaluation (Rubric)





Code	Course Learning Outcomes	Code of CLOs aligned with program	Teaching Strategies	Assessment Methods
			<ul style="list-style-type: none"> • Case Studies 	<ul style="list-style-type: none"> • Quizzes • Midterm Exam • Final Exam
2.2	Apply network management strategies	S3	<ul style="list-style-type: none"> • Demonstrations • Debates/Discussions • Labs Lectures • Group Discussion • Case Studies 	<ul style="list-style-type: none"> • Quizzes • Midterm Exam • Final Exam
2.3	Analyze business goals and constraints using a top-down network design methodology	S4	<ul style="list-style-type: none"> • Demonstrations • Debates/Discussions • Labs Lectures • Group Discussion • Case Studies 	<ul style="list-style-type: none"> • Quizzes • Lab Evaluation (Rubric) • Midterm Exam • Final Exam
2.4	Apply addressing and numbering models, routing protocols, security strategies, and testing and optimization techniques	S5	<ul style="list-style-type: none"> • Demonstrations • Debates/Discussions • Labs Lectures • Group Discussion • Case Studies 	<ul style="list-style-type: none"> • Lab Evaluation (Rubric) • Quizzes • Midterm Exam • Final Exam
3.0	Values, autonomy, and responsibility			
3.1	Work both independently and collaboratively	V1	<ul style="list-style-type: none"> • Presentation • Guest Lectures • Debates/Discussions • Group Projects • Team-based Learning • Case Studies • Seminars 	<ul style="list-style-type: none"> • Rubrics • Note Cards

C. Course Content

No	List of Topics	Contact Hours
1.	Business goals and constraints Analysis, Top-Down network design methodology	3
2.	Technical goals and tradeoffs Analysis	2





	Network topology design	3
4.	Addressing and numbering model	1
5.	Routing protocols selection	3
6.	Network security strategies design	3
7.	Developing Network Management Strategies	3
8.	Technologies and devices for enterprise networks	1
9.	Network design testing and optimization	3
Total		22

No	List of Topics (Lab)	Contact Hours
1.	Designing logical and physical LAN	6
2.	Measuring LAN design performance	6
3.	Designing logical and physical Campus Network/WAN	4
4.	Measuring Campus Network/WAN design performance	6
Total		22

D. Students Assessment Activities

No	Assessment Activities *	Assessment timing (in week no)	Percentage of Total Assessment Score
1.	Homework	Periodically	10%
2.	Midterm	6	20%
3.	Quiz	10	10%
4.	LabEvaluation	Periodically	20%
5.	Final Exam	13	40%
	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	Priscilla Oppenheimer, Top-Down Network Design; 3 rd Edition, Cisco Press, 2010. ISBN- 1587140004
Supportive References	<ul style="list-style-type: none"> • Lee Chao, Networking Systems Design and Development by CRC Press; 1st Edition (December 21, 2009). ISBN-10: 142009159X (TB2) • Teresa C. Piliouras and Kornel Terplan, Network Design: Management and Technical Perspectives, CRC Press (August 19, 1998). ISBN-10: 0849334047 • Klaus Wehrle, MesutGünes, and James Gross, Modeling and Tools for Network Simulation, Springer (September 23, 2010). ISBN-10: 3642123309





	Mani Subramanian; Timothy A. Gonsalves and N. Usha Rani, Network Management: Principles and Practice, Pearson Education India (2010). ISBN-10: 81-3172759-9
Electronic Materials	<ul style="list-style-type: none"> • ACM (Association for Computer Machinery) web site - http://www.acm.org/ • ACM SIGARCH (Special Interest Group on Computer Network) - http://www.sigarch.org/ • IEEE Computer Society web site - http://www.computer.org/portal/web/guest/home • Open access course material online
Other Learning Materials	none

2. Required Facilities and equipment

Items	Resources
facilities (Classrooms, laboratories, exhibition rooms, simulation rooms, etc.)	<ul style="list-style-type: none"> • A classroom or lecture hall with a whiteboard suitable for the number of enrolled students A Communication/Network laboratory
Technology equipment (projector, smart board, software)	<ul style="list-style-type: none"> • A digital image projection system with connection to desktop computer and laptop computer. • High speed Internet connection. An instructor computer station.
Other equipment (depending on the nature of the specialty)	None

F. Assessment of Course Quality

Assessment Areas/Issues	Assessor	Assessment Methods
Effectiveness of teaching	<ul style="list-style-type: none"> • Students • Faculty • Peer Reviewers • Program Leader • Course Coordinator 	<ul style="list-style-type: none"> • Surveys (indirect). • Direct feedback from students (interview between Program leader and students). • Course evaluation by Peer Reviewers (indirect). • Class visit by Program Leader Comprehensive Course report (where we can find information about teaching difficulties and action plan, ...)
Effectiveness of students assessment	<ul style="list-style-type: none"> • Students • Faculty • Peer Reviewers 	<ul style="list-style-type: none"> • Surveys (indirect). • Direct feedback from students (interview



Assessment Areas/Issues	Assessor	Assessment Methods
	<ul style="list-style-type: none"> Course Coordinator Exam Evaluation Committee <p>Course Coordinator</p>	<p>between Program leader and students).</p> <ul style="list-style-type: none"> Assessment results (direct) Course evaluation by Peer Reviewers (indirect). Comprehensive Course report (where we can find information about assessment difficulties and action plan, ...) <p>Exam evaluation by the Exam Evaluation Committee (indirect)</p>
Quality of learning resources	<ul style="list-style-type: none"> Students Faculty Peer Reviewers <p>Course Coordinator</p>	<ul style="list-style-type: none"> Surveys (indirect) Course evaluation by Peer Reviewers (indirect). <p>Comprehensive Course report (where we can find information about difficulties and challenges about learning resources as well as consequences and action plan, ...)</p>
The extent to which CLOs have been achieved	<ul style="list-style-type: none"> Faculty Program Leader Course Coordinator 	<ul style="list-style-type: none"> Student Results (direct) <p>Comprehensive Course report (where we can find the CLO assessment results)</p>
Other		

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

Assessment Methods (Direct, Indirect)

G. Specification Approval

COUNCIL /COMMITTEE	Curriculum Committee Meeting
REFERENCE NO.	
DATE	6 OCTOBER 3023

