



# Course Specification

## (Bachelor)

Course Title: **Network Analysis and Design**

Course Code: **341CCN-3**

Program: **Bachelor of Science in Computer Networks**

Department: **Networks and Communications Engineering**

College: **Computer Science and Information Systems**

Institution: **Najran University**

Version: **1.0**

Last Revision Date: **20 February 2024**



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## A. General information about the course:

### 1. Course Identification

1. Credit hours: ( ..... )

#### 2. Course type

A.  University  College  Department  Track  Others  
 B.  Required  Elective

3. Level/year at which this course is offered: (Level 5/ Year 3)

#### 4. Course General Description:

This course explains and discusses key concepts of network analysis and design, including: network architecture design, requirements analysis, different design considerations, IP addressing design, network architecture design, the network development life cycle, network performance analysis.

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

201CCN-4

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

N/A

#### 7. Course Main Objective(s):

The main objective of this course is to make the students be able to:

- Describe the basic processing units of the computer.
- Recognize the current architecture of computer systems (data representation, performance enhancement, CPU, memory hierarchy design, I/O design).
- Discuss the latest technology in computer science with Modern Architecture.
- Apply conversion formula among different number systems used in digital computers.

Compare different types of instruction set architectures and addressing modes.

### 2. Teaching mode (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	Traditional classroom	60	100%
2	E-learning		



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

### 3. Contact Hours (based on the academic semester)

No	Activity	Contact Hours
1.	Lectures [3 contact hours ´ 15 weeks]	45
2.	Laboratory/Studio	
3.	Field	
4.	Tutorial [1 contact hour ´ 15 weeks]	15
5.	Others (specify)	
<b>Total</b>		<b>60</b>

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

Code	Course Learning Outcomes	Code of PLOs aligned with the program	Teaching Strategies	Assessment Methods
<b>1.0</b>	<b>Knowledge and understanding</b>			
1.1	Define and understand the concepts and terminologies of network Analysis and design.	K1, K2	Lecture	Tests, Quizzes, and Assignments
1.2	Describe the design methodologies and the standards to designs a small to medium networks.	K2	Lecture	Tests, Quizzes, and Assignments
1.3	Understand The network development life cycle.	K2	Lecture	Tests, Quizzes, and Assignments
...				



Code	Course Learning Outcomes	Code of PLOs aligned with the program	Teaching Strategies	Assessment Methods
<b>2.0</b>	<b>Skills</b>			
2.1	Analysis and design different types of networks based on network performance requirements.	S4	Lecture	Tests, Quizzes, and Assignments
2.2	Analysis of different networks in terms of Traffic flow analysis.	S4, S6	Lecture	Tests, Quizzes, and Assignments
2.3	Design effective IP Addressing networks.	S1, S6	Lecture	Tests, Quizzes, and Assignments
<b>3.0</b>	<b>Values, autonomy, and responsibility</b>			
3.1				
3.2				
...				

### C. Course Content

No	List of Topics	Contact Hours
1.	Introduction to Network Analysis and Design	4
2.	Requirements Analysis	8
3.	Network Analysis (Delay, Throughput, Probability Loss, etc.)	8
4.	Design Process	4
5.	Vendor, Equipment, and Service-Provider Evaluations (Making Technology Choices)	4
6.	Network Architecture Design (campus, enterprise, branch & WAN)	8
7.	Network Addressing Design	4
8.	Design Considerations for Expanding an Existing Network	8
9.	Network management & automation Design considerations	4
10.	Network security design considerations	4
11.	Case Studies of LAN Network Design	4
<b>Total</b>		<b>60</b>





## D. Students Assessment Activities

No	Assessment Activities *	Assessment timing (in week no)	Percentage of Total Assessment Score
1.	Quizzes	2 ,4, 8, 11	8%
2.	Assignments or mini project (presentation)	3, 5, 8, 9	12%
3.	Midterm Examination	8th week	30%
4.	Final Examination	16th,17th week	50%

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

## E. Learning Resources and Facilities

### 1. References and Learning Resources

<b>Essential References</b>	<ol style="list-style-type: none"> <li>James D. McCabe, Network Analysis, Architecture, and Design, Third Edition, Morgan Kaufmann Publishers, Inc. 3<sup>rd</sup> Edition, 2007, ISBN: 0123704804</li> <li>Shaun Hummel, Network Planning and Design Guide, Shaun Lloyd Hummel, 2006, ISBN: 0973379804</li> </ol>
<b>Supportive References</b>	<ol style="list-style-type: none"> <li>P. Oppenheimer, Top-Down Network Design, Cisco Press, 2nd edition, ISBN: 1587051524</li> <li>T. Quinn-Andry and K. Haller, Designing Campus Networks, Cisco Press, ISBN: 1578700302</li> </ol> <p>Peter Rybaczyk, Cisco Network Design Solutions for Small-Medium Businesses, CISCO Press, ISBN: 1587055341</p>
<b>Electronic Materials</b>	Available in Blackboard
<b>Other Learning Materials</b>	

### 2. Required Facilities and equipment

Items	Resources
<p><b>facilities</b> (Classrooms, laboratories, exhibition rooms, simulation rooms, etc.)</p>	Lecture Rooms with 20 seats with smart table, Mic, Speaker, PC, Auto Projector with Screen and a whiteboard or a smart board (male Section).
<p><b>Technology equipment</b> (projector, smart board, software)</p>	Desktop/ Laptop computer Multimedia Projector



Items	Resources
<b>Other equipment</b> (depending on the nature of the specialty)	1. A File cabinet to keep class stuff, papers and students' files, and a printer to print program screenshots.

## F. Assessment of Course Quality

Assessment Areas/Issues	Assessor	Assessment Methods
Effectiveness of teaching	Students	<ul style="list-style-type: none"> <li>Indirect (questionnaire)</li> <li>University online questionnaire for evaluation of the course by students.</li> <li>Observing the student's opinions recorded in the college student site.</li> </ul> Appeal & suggestions box
Effectiveness of Students assessment	Peer reviewer	Direct (review of the quality of the exam done by course coordinator)
Quality of learning resources	Faculty & students	Lecturers prepare and create the learning resources before the class begins and make them more related to the course. Questionnaire
The extent to which CLOs have been achieved	Faculty	Student assessments reviewing
Other		

**Assessors** (Students, Faculty, Program Leaders, Peer Reviewers, Others (specify))

**Assessment Methods** (Direct, Indirect)

## G. Specification Approval

<b>COUNCIL /COMMITTEE</b>	NETWORK AND COMMUNICATIONS ENGINEERING DEPARTMENT COUNCIL
<b>REFERENCE NO.</b>	<b>14450824-0482-00014</b>
<b>DATE</b>	<b>5/3/2024</b>

