



T-104  
2022

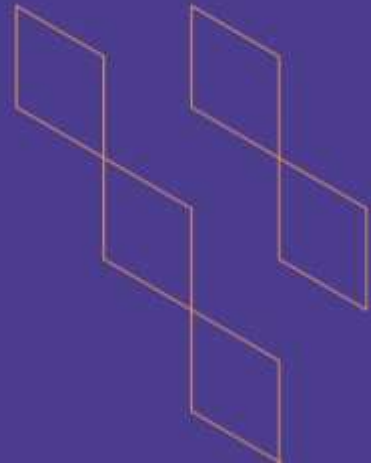
# Course Specification





T-104  
2022

## Course Specification



Course Title: <b>Advanced Computer Networks</b>
Course Code: <b>2244 CIS</b>
Program: <b>Information Systems</b>
Department: <b>NA</b>
College: <b>Applied College</b>
Institution: <b>King Khalid University</b>
Version: <b>1</b>
Last Revision Date: <b>12 August 2023</b>



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## A. General information about the course:

### Course Identification

1. Credit hours: 2

#### 2. Course type

a. University  College  Department  Track  Others

b. Required  Elective

3. Level/year at which this course is offered: 4th Level

#### 4. Course general Description:

This course introduces the principle knowledge and skills needed to install, configure, operate, and troubleshoot a small enterprise network. In addition to understanding of Quality-of-Service (QoS) elements and their applicability and of how virtualized and cloud services will interact with and impact enterprise networks, along with an overview of network programmability and the related controller types and tools that are available to support Software-Defined Network (SDN) architectures. Finally, this course helps the students prepare for the Cisco CCNA® Interconnecting Cisco Networking Devices certificate.

5. Pre-requirements for this course (if any): **2343 CIS**

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

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

Upon completing this course, you will be able to meet these objectives:

- Operate a medium-sized LAN with multiple switches, supporting VLANs, trunking, and spanning tree
- Troubleshoot IP connectivity
- Describe how to configure and troubleshoot Enhanced Interior Gateway Routing Protocol (EIGRP) in an IPv4 environment, and configure EIGRP for IPv6
- Configure and troubleshoot Open Shortest Path First (OSPF) in an IPv4 environment and configure OSPF for IPv6
- Define the characteristics, functions, and components of a WAN
- Describe how device management can be implemented

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

No	Mode of Instruction	Contact Hours	Percentage
1.	Traditional classroom	48	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		

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

No	Activity	Contact Hours
1.	Lectures	16
2.	Laboratory/Studio	32
3.	Field	
4.	Tutorial	
5.	Others (specify)	
	<b>Total</b>	<b>48</b>



## 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	Define the principle knowledge and skills needed to install, configure, operate, and troubleshoot a small enterprise network.	K1	Lectures + Lab	Exams, Assignments, Quizzes
1.2	Understand Quality-of-Service (QoS) elements and their applicability and of how virtualized and cloud services will interact with and impact enterprise networks	K2	Lectures + Lab	Exams, Assignments, Quizzes
1.3	Define Software-Defined Network (SDN) architectures	K3	Lectures	
1.4	Define the functions and components a LAN and WAN	K4	Lectures	
2.0	Skills			
2.1	Design and simulate a small enterprise network for a small organization	S1	Lectures + Lab	Exams, Assignments, Quizzes
2.2	Configure Enhanced Interior Gateway Routing Protocol (EIGRP) and Open Shortest Path First (OSPF) routing protocols for both IPv4 and IPv6 networks	S2	Lectures, Lab	Exams, Assignments, Quizzes
2.3	Troubleshoot a small Enterprise Network	S3	Lectures, Lab	Exams, Lab Assignments, Quizzes
2.4	Design and configure SDN network	S4	Lectures, Lab	Exams, Lab Assignments, Quizzes
3.0	Values, autonomy, and responsibility			
3.1	Illustrate the concepts in both ways of written and oral	V1	Presentations, Lab	Exams, Assignments and presentation
3.2	Write a network application with any programming language	V2	Presentations, Lab	Exams, Assignments and presentation



## C. Course Content

No	List of Topics	Contact Hours
1	<p><b>Operate a medium-sized LAN with multiple switches, supporting VLANs, trunking, and spanning tree</b></p> <p>Implementation of Scalable Medium-Sized Networks</p> <p>1.1 Troubleshooting VLAN Connectivity</p> <p>1.2 Building Redundant Switched Topologies</p> <p>1.3 Improving Redundant Switched Topologies with EtherChannel</p> <ul style="list-style-type: none"> <li>1.4 Understanding Layer 3 Redundancy</li> </ul>	9
2	<p><b>Performing Troubleshoot Basic Connectivity</b></p> <p>2.1 Troubleshooting IPv4 Network Connectivity</p> <ul style="list-style-type: none"> <li>2.2 Troubleshooting IPv6 Network Connectivity</li> </ul>	8
3	<p><b>Describe how to configure and troubleshoot EIGRP in an IPv4 environment, and configure EIGRP for IPv6</b></p> <p>Implementation of an EIGRP-Based Solution</p> <p>3.1 Implementing EIGRP</p> <p>3.2 Implementing EIGRP for IPv6</p> <ul style="list-style-type: none"> <li>3.3 Troubleshooting EIGRP</li> </ul>	8
4	<p><b>Configure and troubleshoot OSPF in an IPv4 environment and configure OSPF for IPv6</b></p> <p>Implementation of a Scalable OSPF-Based Solution</p> <p>4.1 Understanding OSPF</p> <p>4.2 Implementing Multiarea OSPF IPv4</p> <p>4.3 Implementing OSPFv3 for IPv6</p> <ul style="list-style-type: none"> <li>4.5 Troubleshooting Multiarea OSPF</li> </ul>	8
5	<p><b>Define characteristics, functions, and components of a Wide-Area Networks</b></p>	8



	<p>5.1 Understanding WAN Technologies</p> <p>5.2 Understanding Point-to-Point Protocols</p> <p>5.3 Configuring GRE Tunnels</p> <ul style="list-style-type: none"> <li>5.4 Configuring Single-Homed EBGP</li> </ul>	
6	<p><b>Describe how device management can be implemented using the traditional and intelligent ways</b></p> <p>Network Device Management</p> <p>6.1 Implementing Basic Network Device Management and Security</p> <p>6.2 Learning About the Evolution of Intelligent Networks</p> <ul style="list-style-type: none"> <li>6.3 Introducing QoS</li> </ul>	7
<b>Total</b>		<b>48</b>

## D. Students Assessment Activities

No	Assessment Activities *	Assessment timing (in week no)	Percentage of Total Assessment Score
1.	Quiz 1	4	5
2.	Midterm Exam 1	7	10
3.	Practical Assessment	1 to 16	30
4.	Midterm Exam 2	12	10
5.	Quiz 2	14	5
6.	Final Exam	After week 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	CCNA ICND2 Study Guide: Exam 200-105 ISBN10: 1119290988 ISBN13 9781119290988 Publisher: John Wiley & Sons Inc
Supportive References	CCNA ICND2 Study Guide: Exam 200-105 ISBN10: 1119290988 ISBN13 9781119290988 Publisher: John Wiley & Sons Inc
Electronic Materials	<a href="https://study-ccna.com">https://study-ccna.com</a> <a href="http://www.wikipedia.org">www.wikipedia.org</a> to search latest information about state-of-the-art networking concepts <a href="http://www.ieee.org">www.ieee.org</a> to search latest research in relevant field. <a href="http://www.lms.kku.edu.sa">www.lms.kku.edu.sa</a> to access lab manual, announcements related to the course etc.
Other Learning Materials	<a href="https://learningnetwork.cisco.com/s/">https://learningnetwork.cisco.com/s/</a>

### 2. Required Facilities and equipment

Items	Resources
facilities (Classrooms, laboratories, exhibition rooms, simulation rooms, etc.)	<ul style="list-style-type: none"> <li>▪ Lecture Rooms with data show</li> <li>▪ Laboratories with full Network setup.</li> </ul>
Technology equipment (projector, smart board, software)	<ul style="list-style-type: none"> <li>▪ Data show</li> <li>▪ Hardware lab and Kit Box</li> </ul>
Other equipment (depending on the nature of the specialty)	Networking tool Kit Operating System distro Computers Cables Connectors Switches (layer 2 to layer 5, managed and unmanaged) Wireless Access Points Routers Printer, scanner any other computer accessory



## F. Assessment of Course Quality

Assessment Areas/Issues	Assessor	Assessment Methods
Effectiveness of teaching	Students	Indirect
Effectiveness of students assessment	Course Teacher	Direct
Quality of learning resources	Program Supervisor, Quality Unit	Direct
The extent to which CLOs have been achieved	Course Teacher	Direct
Other	Course Teacher, Quality Unit	Direct

**Assessor** (Students, Faculty, Program Leaders, Peer Reviewer, Others (specify))

**Assessment Methods** (Direct, Indirect)

## G. Specification Approval Data

COUNCIL /COMMITTEE	
REFERENCE NO.	
DATE	

