T-104
2022

Course Specification

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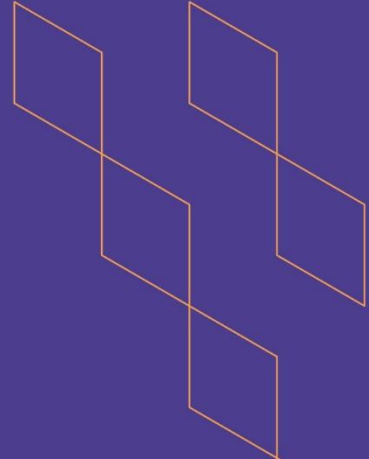
Course Title: **Computer Networks**
Course Code: **2343 CIS**
Program: **Information Systems**
Department: **NA**
College: **Applied College**
Institution: **King Khalid University**
Version: **1**
Last Revision Date: **6 August 2023**

Table of Contents:

A. General information about the course:

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:		3rd Level			

4. Course general Description:

This course introduces the principle, design and implementation of Computer Networks. It Covers fundamental concepts of computer communication networks and associated Protocols. Moreover, this course focuses on providing the skills and knowledge required to install, operate, configure, and verify a basic IPv4 and IPv6 network, including configuring a LAN switch, configuring an IP router, connecting to a WAN, and identifying basic security threats. At the end of this course students should be able to complete the configuration, implementation and troubleshooting of a small branch network under supervision. Finally, this course helps the students prepare for the Cisco CCNA® Routing and Switching CCENT® certifications and for associate-level routing and switching network engineering roles.

5. Pre-requirements for this course (if any): 1301CIS

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:

- Describe network fundamentals and build simple LANs
- Establish Internet connectivity
- Manage network device security
- Expand small to medium sized networks with WAN connectivity
- Describe IPv6 basics

1. Teaching mode (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1.	Traditional classroom	64	100
2.	E-learning		
3.	Hybrid • Traditional classroom • E-learning		
4.	Distance learning		

2. Contact Hours (based on the academic semester)

No	Activity	Contact Hours
1.	Lectures	32
2.	Laboratory/Studio	32
3.	Field	
4.	Tutorial	
5.	Others (specify)	
	Total	64

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 basics of computer networks	k1	Lectures + Lab	Exams, Assignments, Quizzes
1.2	Describe the services at the application, network, data link and physical layers using OSI, TCP and UDP reference models	k1	Lectures + Lab	Exams, Assignments, Quizzes
1.3	Understand fundamentals of LAN switching	k2	Lectures + Lab	Exams, Assignments, Quizzes
1.4	Understand fundaments of Routing. Differentiate between Static and Dynamic routing. Compare different routing protocols	k2	Lectures + Lab	Exams, Assignments, Quizzes
2.0	Skills			
2.1	Analyze the hardware requirement to setup a computer network for an organization.	s1	Lectures + Lab	Exams, Assignments, Quizzes
2.2	Design a network for small organization	s2	Lectures, Lab, group discussion	Exams, Assignments, Quizzes
2.3	Configure and verify different variety of routing protocols	s3	Lectures, Lab, group discussion	Exams, Lab Assignments, Quizzes
2.4	Troubleshoot basic LAN and WAN issues	s4		
3.0	Values, autonomy, and responsibility			
3.1	Demonstrate the ability to design computer networks. Illustrate the ideas, skills and knowledge about the topic in written and oral form	v1	Lectures, Lab, Case Study	Exams, Assignments and presentation
3.2	Show the ability of taking responsibility for self-learning and	v2	Presentations, Lab	Exams, Assignments and presentation

Code	Course Learning Outcomes	Code of CLOs aligned with program	Teaching Strategies	Assessment Methods
	continuing personal and professional development.			
3.3	Demonstrate the ability of being a team player and delivering within deadlines	v3	Presentations, Lab, Groupwork	Exams, Assignments and presentation

C. Course Content

No	List of Topics	Contact Hours
1	**Network Fundamentals** 1.1 Compare and contrast OSI and TCP/IP models 1.2 Compare and contrast TCP and UDP protocols 1.3 Describe the impact of infrastructure components in an enterprise network 1.4 Compare and contrast collapsed core and three-tier architectures 1.5 Compare and contrast network topologies 1.6 Select the appropriate cabling type based on implementation requirements 1.7 Apply troubleshooting methodologies to resolve problems 1.8 Configure, verify, and troubleshoot IPv4 addressing and subnetting 1.9 Compare and contrast IPv4 address types 1.10 Describe the need for private IPv4 addressing 1.11 Identify the appropriate IPv6 addressing scheme to satisfy addressing requirements in a LAN/WAN environment 1.12 Configure, verify, and troubleshoot IPv6 addressing 1.13 Configure and verify IPv6 Stateless Address Auto Configuration 1.14 Compare and contrast IPv6 address types	**13**
2	**LAN Switching Fundamentals**	13

	2.1 Describe and verify switching concepts 2.2 Interpret Ethernet frame format 2.3 Troubleshoot interface and cable issues (collisions, errors, duplex, speed) 2.4 Configure, verify, and troubleshoot VLANs (normal range) spanning multiple switches 2.5 Configure, verify, and troubleshoot interswitch connectivity 2.6 Configure and verify Layer 2 protocols 2.7 Configure, verify, and troubleshoot port security	
3	**Routing Fundamentals** 3.1 Describe the routing concepts 3.2 Interpret the components of routing table 3.3 Describe how a routing table is populated by different routing information sources 3.4 Configure, verify, and troubleshoot inter-VLAN routing 3.5 Compare and contrast static routing and dynamic routing 3.6 Configure, verify, and troubleshoot IPv4 and IPv6 static routing 3.7 Configure, verify, and troubleshoot RIPv2 for IPv4 (excluding authentication, filtering, manual summarization, redistribution)	13
4	**Infrastructure Services** 4.1 Describe DNS lookup operation 4.2 Troubleshoot client connectivity issues involving DNS 4.3 Configure and verify DHCP on a router (excluding static reservations) 4.4 Troubleshoot client- and router-based DHCP connectivity issues 4.5 Configure and verify NTP operating in client/server mode 4.6 Configure, verify, and troubleshoot IPv4 standard numbered and named access list for routed interfaces 4.7 Configure, verify, and troubleshoot inside source NAT	13

	Infrastructure Maintenance		
5	5.1 Configure and verify device-monitoring using syslog 5.2 Configure and verify device management 5.3 Configure and verify initial device configuration 5.4 Configure, verify, and troubleshoot basic device hardening 5.5 Perform device maintenance 5.6 Use Cisco IOS tools to troubleshoot and resolve problems		12
	Total		64

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	Data Communications and Networking By Behrouz A. Forouzan with Sophia Chung Fegan, 4th International Edition, 2007, McGraw Hill. Odom, W. (2013). Cisco CCENT/CCNA ICND1 100-101 official cert guide. Indianapolis, IN: Cisco Press.
Supportive References	List Essential References Materials (Journals, Reports, etc.) Computer Networks By Andrew S. Tanenbaum, 4th International Edition, 2003. Prentice Hall
Electronic Materials	List Electronic Materials (eg. Web Sites, Social Media, Blackboard, etc.) academia.edu: Data Communications and Networking-Textbook Cisco Press. http://proquest.safaribooksonline.com/9780133367867. CCENT ICND1 100-101: http://bit.ly/OdomCCENTCCNA www.wikipedia.org to search latest information about state-of-the-art networking concepts www.ieee.org to search latest research in relevant field. www.lms.kku.edu.sa to access lab manual, announcements related to the course etc.
Other Learning Materials	Online Tutorials https://learningnetwork.cisco.com/s/article/100-105-icnd1-study-materials

2. Required Facilities and equipment

Items	Resources
facilities (Classrooms, laboratories, exhibition rooms, simulation rooms, etc.)	▪ Lecture Rooms with data show ▪ Laboratories with full Network setup.

Items	Resources
Technology equipment (projector, smart board, software)	Networking tool Kit Operating System CDs Computers Cables Connectors Switches Routers Printer
Other equipment (depending on the nature of the specialty)	

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	