اعتماد
NCAAA

T4

2020

Course Specifications

Course Title:	Network Operating System
Course Code:	332 CNET-3
Program:	Bachelor in Computer and Network Engineering
Department:	Computer and Network Engineering
College:	College of Computer Science and Information Technology
Institution:	Jazan University

Table of Contents

A. Course Identification

1. Credit hours: 3	

2. Course type

a.   University ☐   College ☐   Department ☑   Others ☐

b.   Required ☑   Elective ☐

3. Level/year at which this course is offered: Level 11 / Year 04

4. Pre-requisites for this course (if any)**:** 231COMP – 3 Operating System

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

6. Mode of Instruction (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	**Traditional classroom**	52	100%
2	**Blended**	--	--
3	**E-learning**	--	--
4	**Distance learning**	--	--
5	**Other**	--	--

7. Contact Hours (based on academic semester)

No	Activity	Contact Hours
1	**Lecture**	22
2	**Laboratory/Studio**	22
3	**Tutorial**	--
4	**Others** (specify)	8
	Total	52

B. Course Objectives and Learning Outcomes

1. Course Description

This course focuses on the key issues that need to be considered when deciding to use a network operating system. Some of the questions raised are what is a network operating system (NOS) and when do user need one, what are the main types of NOS and how do they differ; can user buy a cheap NOS for small LAN. How does user choose suitable NOS for network systems, and can user have more than one NOS running on network. This Course goes on to demonstrate the linkage between NOS and other elements of the overall IT platform: network management, application programming interfaces and network computing. This Course also describes the core elements of Active Directory and Security related Issues.

2. Course Main Objective

This course will develop the students' ability to learn:

- Describe the functions which are unique to network operating systems vs other operating systems.
- Differentiate different NOS's and their characteristics.
- Describe different types of Hypervisors.
- Discuss Network Operating System as per user requirement.
- Analysis of Directory Services and its main Security Issues.
- How to manage and maintain components of Active Directory.
- Compare and contrast main aspects of different categories of Distributed Systems.
- Describe three tier architecture of client Server.
- Measure different Architectural aspects of Multiprocessor.

3. Course Learning Outcomes

	CLOs	Aligned PLOs
1	**Knowledge and Understanding**	
1.1	**Describe** the concepts and components of Network Operating System	K1
1.2	**Explain** different categories of distributed system architectures.	K2
1.3	**Outline** the strategy to choose a network operating system as per the organizations need based on latest trends.	K3
2	**Skills :**	
2.1	**Design** and analyze the logical structure of Active directory for an organization	S5
2.2	**Demonstrate** steps an administrator should use to manage and maintain Network Administration.	S2
2.3	**Implement** different architectures in advanced distributed system.	S3
2.4	**Communicate** effectively presenting their assignments and case study.	S4
3	**Values:**	
3.1	**Show** team work attribute, working on group assignment related to Network operating systems.	V1

C. Course Content

No	List of Topics	Contact Hours
1	**Chapter 1: Network Operating System:** • Network operating system • Peer-to-peer and client/server network operating systems. • System Models: Virtual Machines, Implementation of VMMs • Key features of each network operating systems	4T + 4P
2	**Chapter 2: Network Services and Software:** • Different Network Services offered by NOS • Types of network operating systems with their architecture. • Components of a Linux System, Design principles of Linux system	4T + 4P

	• Selecting NOS as per Organizations requirement.	
3	**Chapter 3: Introduction to Distributed Systems:** • Distributed System Architecture • Reasons of DS • Middleware • Multiprocessor Architecture • Multiprocessor Traffic Control System • Client Server Architecture • Thin and Fat layers	3T + 3P
4	**Chapter 4: Advanced Distributed Systems:** • Three Tier Architecture • Distributed Object Architecture • Advantages and uses of Distributed Object Architecture • Distributed Operating System, Design issues of Distributed systems • Data Mining System • COBRA and Application Structure • COBRA Standards and objects • Object request Broker (ORB)	3T + 3P
5	**Chapter 5: Windows Server Administration Fundamentals:** • Revolutionary system management and administration concepts introduced with Windows Server • System components, Kernel, Kernel – process and threads, scheduling • Domain Controllers and Member Servers • Understanding and Using Server Roles • Frequently Used Tools • Using Control Panel Utilities • Using Command based Utilities	4T + 4P
6	**Chapter 6: Active Directory:** • Managing and Maintaining Physical and Logical Devices. • Managing Users, Computers, and Groups • Managing and Maintaining Access to Resources • Managing and Maintaining a Server Environment • File System NTFS, internal layout, recovery, security • Managing and Implementing Disaster Recovery • Windows Server Active Directory • Active Directory Objects, Active Directory Schema • Active Directory Logical Structure and Components • Active Directory Communications Standards • Active Directory Physical Structure	4T + 4P
	Final Exam	4T+4P
Total		52

Online Study Topics:
- System Models: Virtual Machines, Implementation of VMMs.   - Design principles of Linux system   - COBRA and Application Structure, Standards and objects.   - System components, Kernel, Kernel – process and threads, scheduling   - File System NTFS, internal layout, recovery, security

D. Teaching and Assessment

1. Alignment of Course Learning Outcomes with Teaching Strategies and Assessment Methods

Code	Course Learning Outcomes	Teaching Strategies	Assessment Methods
1.0	**Knowledge and Understanding**		
1.1	**Describe** the main concepts and components of Network Operating System	Visual &Verbal [Lectures / Presentations]	- Midterm Exam - Final exam. - Assignment 1 - Case study.
1.2	**Explain** different categories of distributed system architectures.	Visual &Verbal [Lectures / Presentations]	- Midterm Exam - Final exam. - Assignment 1 - Case study.
1.3	**Outline** the strategy to choose a network operating system as per the organizations need based on latest trends.	Visual &Verbal [Lectures / Presentations]	- Midterm Exam - Final exam. - Assignment 1 - Case study.
2.0	**Skills**		
2.1	**Design** and analyze the logical structure of Active directory for an organization	Visual &Verbal [Lectures / Presentations]	- Midterm Exam - Final exam. - Assignment 1 - Assignment 2 / Case study.
2.2	**Demonstrate** steps an administrator should use to manage and maintain Network Administration.	Visual &Verbal [Lectures / Presentations]	- Midterm Exam - Final exam. - Lab Exam - Assignment 1 - Assignment 2 / Case study.
2.3	**Implement** different architectures in advanced distributed system.	Visual &Verbal [Lectures / Presentations]	- Midterm Exam - Final exam. - Assignment 1 - Assignment 2 / Case study.
2.4	**Communicate** effectively presenting their assignments and case study.	Visual &Verbal [Lectures / Presentations]	- Midterm Exam - Final exam. - Lab Exam - Assignment 1

Code	Course Learning Outcomes	Teaching Strategies	Assessment Methods
			• Assignment 2 / Case study.
3.0	**Values**		
3.1	**Show** team work attribute, working on group assignment related to Network operating systems.	Visual &Verbal [Lectures / Presentations]	• Assignment 1 • Assignment 2 / Case study.

2. Assessment Tasks for Students

#	Assessment task*	Week Due	Percentage of Total Assessment Score
1	Assignments / Mini Project	4th Week	20%
2	Midterm Exam	6th Week	20%
3	Lab Exam	11th Week	20%
4	Final Theory Exam	12th Week	40%

*Assessment task (i.e., written test, oral test, oral presentation, group project, essay, etc.)

E. Student Academic Counseling and Support

Arrangements for availability of faculty and teaching staff for individual student consultations and academic advice :

In CNET department Academic Advising committee has been formed to provide the counseling for all students. In addition to that, each faculty member should have atleast 3 office hours per week for course related consultation to students.

F. Learning Resources and Facilities

1.Learning Resources

Required Textbooks	Title: Operating System Concepts, 10th Edition, Abraham Silberschatz, Greg Gagne, Peter B. Galvin, ISBN: 978-1-119-32091-3, April 2018 Title: Network Operating System Making the right choices By Philip Hunter ISBN-10: 0201627663 ISBN-13: 978-0201627664

Essential References Materials	1. Linux with Operating System Concepts
	By Richard Fox, ISBN 9781138455498
	Published June 29, 2017 by Chapman and Hall/CRC
	2. Coulouris, Dollimore and Kindberg, Distributed Systems:
	        Concepts and Design.
	3. Network operating system A Complete Guide Paperback – August 19, 2021
	by Gerardus Blokdyk, ISBN-10 : 0655328688
	ISBN-13 : 978-0655328681
	4. Ciccarelli, .Faulkner "CCNA" Jumpstart Sybax San Franciso
	        International publication.

Electronic Materials	**Blackboard:-** https://lms.jazanu.edu.sa/webapps/portal/execute/tabs/tabAction?tab_tab_group_id=_1_1 **Online Fedora support:** http://technet.microsoft.com/en-us/windowsserver/default.aspx www.Fedora.org
Other Learning Materials	**Windows server Latest Version and Linux Server/Fedora 24**

2. Facilities Required

Item	Resources
Accommodation (Classrooms, laboratories, demonstration rooms/labs, etc.)	The strength of students should not exceed 25. The lectures should be placed in a lab with the following requirements: - Server that is connected to projector. - Enough workstations that are connected directly to network. - Network Printer - A Network Linux Based Server
Technology Resources (AV, data show, Smart Board, software, etc.)	▪ A well dedicated Linux based Lab with the following facilities: ▪ A Data show and a Smart / White board. ▪ Linux Server and clients ▪ An active internet connection.
Other Resources (Specify, e.g. if specific laboratory equipment is required, list requirements or attach a list)	• Fedora Server and Client • And different Server software's to give a broad exposure to the students. ▪ A File cabinet to keep Class Stuffs, Markers, papers and students Files, and a printer to print screen shots.

G. Course Quality Evaluation

Evaluation Areas/Issues	Evaluators	Evaluation Methods
Sufficiency of resources and facilities for students	Students	Course evaluation survey form
Effectiveness of teaching / learning process	Students	Course evaluation survey form
Effectiveness of teaching / learning process	CRC / QAU / HoD	Course reports / result analysis
Quality of learning Resources	Track leaders / CRC	Review meetings and star rating with suggestions for further modification and improvements
Verifying standards of student achievement / evaluation	HoD / committee nominated by HoD	Random re-checking of evaluated answer sheets
Achievement of course learning outcomes	Course Teachers / QAU	CLO assessment template that is further verified at

Evaluation Areas/Issues	Evaluators	Evaluation Methods
		course coordinator, Track leader and QAU level.

Evaluation areas (e.g., Effectiveness of teaching and assessment, Extent of achievement of course learning outcomes, Quality of learning resources, etc.)
Evaluators (Students, Faculty, Program Leaders, Peer Reviewer, Others (specify)
Assessment Methods (Direct, Indirect)

H. Specification Approval Data

Council / Committee	DEPARTMENT COUNCIL
Reference No.	
Date	