CNIT R131: ADMINISTER MICROSOFT WINDOWS SERVER

Originator
alynch

College
Oxnard College

Discipline (CB01A)
CNIT - Computer Networking/IT

Course Number (CB01B)
R131

Course Title (CB02)
Administer Microsoft Windows Server

Banner/Short Title
Admin Microsoft Windows Server

Credit Type
Credit

Start Term
Fall 2021

Formerly
ENGT R131

Catalog Course Description
This course prepares students to administer the most recent version of the Microsoft Windows Server operating system while preparing students to become certified. Students will learn how to administer a network and manage resources including: configuring server roles, automating server deployments, setting up DHCP and DNS services, designing an Active Directory infrastructure, planning file and print services, managing user accounts, maintaining server availability with clusters, automating backups, virtualization, and deploying updates and security features.

Taxonomy of Programs (TOP) Code (CB03)
0708.10 - *Computer Networking

Course Credit Status (CB04)
D (Credit - Degree Applicable)

Course Transfer Status (CB05) (select one only)
B (Transferable to CSU only)

Course Basic Skills Status (CB08)
N - The Course is Not a Basic Skills Course

SAM Priority Code (CB09)
C - Clearly Occupational

Course Cooperative Work Experience Education Status (CB10)
N - Is Not Part of a Cooperative Work Experience Education Program

Course Classification Status (CB11)
Y - Credit Course

Educational Assistance Class Instruction (Approved Special Class) (CB13)
N - The Course is Not an Approved Special Class

Course Prior to Transfer Level (CB21)
Y - Not Applicable

Course Noncredit Category (CB22)
Y - Credit Course

Funding Agency Category (CB23)
Y - Not Applicable (Funding Not Used)

Course Program Status (CB24)
1 - Program Applicable

General Education Status (CB25)
Y - Not Applicable

Support Course Status (CB26)
N - Course is not a support course

Field trips
May be required

Grading method
Letter Graded

Alternate grading methods
Credit by exam, license, etc.

Does this course require an instructional materials fee?
No

Repeatable for Credit
No

Units and Hours

Carnegie Unit Override
No

In-Class

Lecture
Minimum Contact/In-Class Lecture Hours
43.75
Maximum Contact/In-Class Lecture Hours
43.75

Activity

Laboratory
Minimum Contact/In-Class Laboratory Hours
26.25
Maximum Contact/In-Class Laboratory Hours
26.25

Total in-Class

Total in-Class
Total Minimum Contact/In-Class Hours
70

Total Maximum Contact/In-Class Hours
70

Outside-of-Class

Internship/Cooperative Work Experience

Paid

Unpaid

Total Outside-of-Class

Total Outside-of-Class
Minimum Outside-of-Class Hours
87.5
Maximum Outside-of-Class Hours
87.5

Total Student Learning

Total Student Learning
Total Minimum Student Learning Hours
157.5
Total Maximum Student Learning Hours
157.5

Minimum Units (CB07)
3
Maximum Units (CB06)
3

Advisories on Recommended Preparation
CNIT R130

Entrance Skills

Entrance Skills

Students require an understanding of the Windows 10 operating system in order to manage Windows 10 computers with the Windows Server operating system.

Prerequisite Course Objectives

CNIT R130-Install the Microsoft Windows 10 operating system using multiple methods including DVD, USB, and imaging.
CNIT R130-Create a reference computer, capture a Windows 10 image of the reference computer OS, and deploy the image to other computers.
CNIT R130-Administer permissions on volumes, files, folders, and printers to control access to resources.
CNIT R130-Setup and configure a network-based printer for a Windows network.
CNIT R130-Configure and manage hardware devices and drivers.
CNIT R130-Harden the Windows 10 operating system using Microsoft Defender Antivirus and the built-in Microsoft Defender Firewall.
CNIT R130-Troubleshoot issues related to the proper functioning of the Windows 10 operating system
CNIT R130-Update the Windows operating system, applications, and drivers to ensure security and a stable operating system.
CNIT R130-Encrypt a partition with Microsoft BitLocker technology to protect the confidentiality of data.
CNIT R130-Network Windows 10 devices together to form a LAN using IPv4 and IPv6 addressing while protecting the confidentiality of data traveling across the network.
CNIT R130-Create a Windows 10 virtual machine (VM) with specific resource settings using the Hyper-V app.

Requisite Justification

Requisite Type
Advisory

Requisite
CNIT R130

Requisite Description
Course in a sequence

Level of Scrutiny/Justification
Content review

Student Learning Outcomes (CSLOs)

	Upon satisfactory completion of the course, students will be able to:
1	Create user and group accounts in Windows Server using Active Directory.
2	Use server manager to implement a DHCP server and configure a scope of IP addresses for clients.
3	Configure Windows Server Hyper-V to implement a virtual machine with the necessary resources for the virtualized operating system.

Course Objectives

	Upon satisfactory completion of the course, students will be able to:
1	Implement Windows Server Update Services (WSUS) solutions.
2	Deploy DHCP and DNS services on a Windows network.
3	Design an Active Directory infrastructure.
4	Deploy active Directory domain services.
5	Configure additional roles and services using Microsoft Hyper-V virtualization.
6	Plan file and print services for a Windows based network.
7	Plan and configure storage solutions.
8	Implement security using complex passwords, encryption, appropriate NTFS permissions, and updates to patch applications and the operating system.
9	Configure and authenticate remote access.
10	Configure a certificate authority (CA) and manage certificate templates.
11	Monitor and optimize the Windows Server OS using consoles.
12	Plan and implement a backup strategy using Windows Server software.
13	Examine network server fundamentals.
14	Identify the hardware components of a server.
15	Identify some of the industry's best practices for deploying a server and the various strategies of securing, accessing, and remotely managing the server hardware.
16	Troubleshoot hardware and software issues on servers.
17	Describe disaster recovery concepts and techniques.

Course Content

Lecture/Course Content

1. Server Deployments
   a. Windows Deployment Services (WDS)
   b. Image File
   c. Windows Server Update Services (WSUS)
2. DHCP Services
   a. DHCP Communication
   b. DHCP Infrastructure
   c. Static vs Dynamic Addresses
   d. IPv6 Addresses
3. Active Directory

   a. AD Architecture
   b. Objects and Attributes
   c. Organizational Units
   d. Groups, Domain Trees, and Forests
   e. Lightweight Directory Access Protocol (LDAP)
4. Virtualization
   a. Virtualization Architectures
   b. Hyper-V
   c. Virtualizing Operating Systems
   d. Virtualizing Applications
5. File and Print Services
   a. Shares and Access Control
   b. Mapping Drives
   c. Distributed File System (DFS)
   d. Windows Print Architecture
   e. Sharing a Printer
   f. Deploying a Printer
6. Storage Solutions
   a. Estimating Storage Requirements
   b. Disk Technology
   c. Storage Fault Tolerance
   d. RAID Technology
   e. Partitions and Volumes
   f. Storage Area Network (SAN)
7. Security
   a. Authentication
   b. Windows Firewall
   c. NTFS Permissions and Encryption
   d. Updates, Patches, and Service Packs
8. Remote Access
   a. Windows Remote Desktop
   b. Remote Access Policy
   c. Remote Access Authentication and Encryption
9. Certificate Authority
   a. Certificates
   b. Planning a CA Deployment
   c. CA Hierarchy
   d. Issuing and Revoking Certificates
10. Monitoring Servers
   a. Event Viewer Console
   b. Performance Monitor
   c. Reliability Monitor
   d. Auditing
11. Backups
   a. Backup Strategy
   b. Backup Hardware
   c. Backup Software
   d. Windows Server Backup
12. Exploring the server hardware
   a. Identify server system board components
   b. Explore system processing core
   c. Explore server memory
   d. Examine server cooling and power systems
13. Examining the issues in upgrading server components
   a. Examine an upgrade checklist
   b. Examine the issues in upgrading server hardware
   c. Examine the issues in upgrading server software
14. Troubleshooting servers

   a. Examine the troubleshooting theory and methodologies
   b. Troubleshoot server hardware problems
   c. Troubleshoot server software problems
   d. Troubleshoot server network problems
   e. Troubleshoot server storage device problems
15. Exploring disaster recovery concepts and methodologies
   a. Examine disaster recovery plans
   b. Implement disaster recovery methodologies
   c. Implement replication methods

Laboratory or Activity Content

1. Server Deployments
   a. Windows Deployment Services (WDS)
   b. Image File
   c. Windows Server Update Services (WSUS)
2. IP Addressing and DHCP Services
   a. Configure Static IPv4 addresses
   b. Configure Static IPv6 addresses
   c. DHCPv4
   d. DHCPv6
3. Active Directory
   a. Create Organizational Units
   b. Configure Groups, Domain Trees, and Forests
   c. Query with Lightweight Directory Access Protocol (LDAP)
4. Virtualization
   a. Hyper-V
   b. Virtualizing Operating Systems
   c. Virtualizing Applications
5. File and Print Services
   a. Shares and Access Control
   b. Mapping Drives
   c. Sharing a Printer
   d. Deploying a Printer
6. Storage Solutions
   a. Estimating Storage Requirements
   b. Disk Technology
   c. Storage Fault Tolerance
   d. RAID Technology
   e. Partitions and Volumes
7. Security
   a. Authentication
   b. Implement a Secure Password Policy
   c. Windows Firewall
   d. NTFS Permissions and Encryption
   e. Updates, Patches, and Service Packs
8. Remote Access
   a. Windows Remote Desktop
   b. Access Devices Using Remote Access Authentication and Encryption
9. Certificate Authority
   a. Creating a CA
   b. Issuing Certificates
   c. Revoking Certificates
   d. Authentication and Encryption with Certificates
10. Monitoring System Resources
   a. Event Viewer Console
   b. Performance Monitor
   c. Reliability Monitor
   d. Auditing
   e. Identify server system board components

   f. Explore system processing core
   g. Explore server memory
   h. Examine server cooling and power systems
11. Backups
   a. Implementing a Backup Strategy
   b. Backup Hardware
   c. Backup Software
   d. Windows Server Backup
12. Troubleshooting servers
   a. Troubleshoot server hardware problems
   b. Troubleshoot server software problems
   c. Troubleshoot server network problems
   d. Troubleshoot server storage device problems

Methods of Evaluation

Which of these methods will students use to demonstrate proficiency in the subject matter of this course? (Check all that apply):

Problem solving exercises
Skills demonstrations
Written expression

Methods of Evaluation may include, but are not limited to, the following typical classroom assessment techniques/required assignments (check as many as are deemed appropriate):

Computational homework
Essays
Group projects
Individual projects
Laboratory activities
Laboratory reports
Objective exams
Oral presentations
Projects
Problem-Solving Assignments
Quizzes
Reports/papers
Skills demonstrations
Skill tests

Instructional Methodology

Specify the methods of instruction that may be employed in this course

Audio-visual presentations
Computer-aided presentations
Collaborative group work
Class activities
Class discussions
Distance Education
Demonstrations
Group discussions
Guest speakers
Instructor-guided use of technology
Internet research
Laboratory activities
Lecture
Small group activities

Describe specific examples of the methods the instructor will use:

1. Instructor will use publisher-provided PowerPoints to lecture on Microsoft Windows Server course topics.
2. The instructor will introduce Windows Server lab activities and demonstrate lab solutions when appropriate.
3. Small group research of current security threats to the Windows Server operating system and best practices to defend against specific threats. Students will report out to the class on their findings.

4. The instructor may illustrate to the class new features of the Windows Server operating system that are so new that they are not covered in the curriculum at the time it was published.

Representative Course Assignments

Writing Assignments

1. Students are required to answer reflection questions at the end of their lab activities to demonstrate that they grasp the material in the lab and to see if they can relate their knowledge to a new MS Windows Server scenario.
2. Exam and/or quiz questions may require writing a summary such as explaining the advantages and disadvantages of RAID 5 backups as compared to RAID 1 backups.

Critical Thinking Assignments

1. Evaluation of a cybersecurity vulnerability for Windows Server and specific written recommendations to mitigate the risk.
2. Students will be presented with a fictitious scenario and they will need to incorporate critical thinking in their response. For example, a company is using the Windows Server 2012 operating system and they would like to be presented with a compelling argument as to why it would be advantageous to upgrade to the most recent version of Windows Server.

Reading Assignments

1. Students are required to read and study the information in the assigned chapter of the book in between classes in order to be prepared for the lecture and classroom activities. A typical reading activity would be for a student to read the chapter on dynamic host configuration protocol (DHCP) so that they are prepared to configure MS Windows Server to automatically assign IP addressed to clients.
2. Students will be required to perform reading from assigned support websites such as www.microsoft.com (http://www.microsoft.com) and www.sans.org (http://www.sans.org). These websites will provide students with the most recent threats to the MS Windows Server OS and how to counter these threats.

Skills Demonstrations

1. Students will demonstrate that they can install the most recent version of Windows Server using virtualization (Hyper-V) using specified configuration settings.
2. Students will push out Microsoft Windows Updates to Windows desktop clients using the Windows Server WSUS role.

Other assignments (if applicable)

1. In order to prepare for the most recent Microsoft Server OS certification exam, students will be required to answer certification preparation questions from third party cert prep resources.

Outside Assignments

Representative Outside Assignments

1. Read the assigned Windows Server curriculum.
2. Read Microsoft security blogs at www.microsoft.com and answer discussion questions in the course portal as it relates to Windows Server security vulnerabilities and how to deal with risk.

Articulation

C-ID Descriptor Number

ITIS 155

Status

Aligned

Comparable Courses within the VCCCD

CNSE M31 - MS Windows Network Server

Equivalent Courses at other CCCs

College	Course ID	Course Title	Units
Santa Barbara City College	CNEE 110	MS Windows Network Infrastructure	3

District General Education

A. Natural Sciences

B. Social and Behavioral Sciences

C. Humanities

D. Language and Rationality

E. Health and Physical Education/Kinesiology

F. Ethnic Studies/Gender Studies

CSU GE-Breadth

Area A: English Language Communication and Critical Thinking

Area B: Scientific Inquiry and Quantitative Reasoning

Area C: Arts and Humanities

Area D: Social Sciences

Area E: Lifelong Learning and Self-Development

CSU Graduation Requirement in U.S. History, Constitution and American Ideals:

IGETC

Area 1: English Communication

Area 2A: Mathematical Concepts & Quantitative Reasoning

Area 3: Arts and Humanities

Area 4: Social and Behavioral Sciences

Area 5: Physical and Biological Sciences

Area 6: Languages Other than English (LOTE)

Textbooks and Lab Manuals

Resource Type
Textbook

Description
Microsoft Official Academic Course (2017). *Windows Server 2016: Installation, Storage, and Compute* (1st). Wiley.

Resource Type
Other Resource Type

Description
www.microsoft.com and www.sans.org.

Resource Type
Other Resource Type

Description
Microsoft Official Academic Course (MOAC) Labs Online.

Resource Type
Other Instructional Materials

Description
Windows Server 2016 Operating System.

Distance Education Addendum

Definitions

Distance Education Modalities
Hybrid (51%–99% online)
Hybrid (1%–50% online)
100% online

Faculty Certifications

Faculty assigned to teach Hybrid or Fully Online sections of this course will receive training in how to satisfy the Federal and state regulations governing regular effective/substantive contact for distance education. The training will include common elements in the district-supported learning management system (LMS), online teaching methods, regular effective/substantive contact, and best practices.
Yes

Faculty assigned to teach Hybrid or Fully Online sections of this course will meet with the EAC Alternate Media Specialist to ensure that the course content meets the required Federal and state accessibility standards for access by students with disabilities. Common areas for discussion include accessibility of PDF files, images, captioning of videos, Power Point presentations, math and scientific notation, and ensuring the use of style mark-up in Word documents.
Yes

Regular Effective/Substantive Contact

Hybrid (1%–50% online) Modality:

Method of Instruction	Document typical activities or assignments for each method of instruction
Asynchronous Dialog (e.g., discussion board)	Topics will be presented for discussion with the opportunity to provide commentary and feedback on fellow student responses.
E-mail	Email will be used for individual interaction between professor and student, to send group email reminders of deadlines, to inform of upcoming course content.
Face to Face (by student request; cannot be required)	Face to face with students will take place at student request to discuss specific questions, issues, or concerns.
Video Conferencing	Zoom or comparable video conferencing software to lecture on course content, demonstrate lab assignments, answer student questions in real time, and provide student assistance on anything that is course related.
Other DE (e.g., recorded lectures)	Any real-time instruction will be recorded and available to students through the LMS.

Hybrid (51%–99% online) Modality:

Method of Instruction	Document typical activities or assignments for each method of instruction
Asynchronous Dialog (e.g., discussion board)	Topics will be presented for discussion with the opportunity to provide commentary and feedback on fellow student responses.
E-mail	Email will be used for individual interaction between professor and student, to send group email reminders of deadlines, to inform of upcoming course content.

Face to Face (by student request; cannot be required)	Face to face with students will take place at student request to discuss specific questions, issues, or concerns.
Video Conferencing	Zoom or comparable video conferencing software to lecture on course content, demonstrate lab assignments, answer student questions in real time, and provide student assistance on anything that is course related.
Other DE (e.g., recorded lectures)	Any real-time instruction will be recorded and available to students through the LMS.

100% online Modality:

Method of Instruction	**Document typical activities or assignments for each method of instruction**
Asynchronous Dialog (e.g., discussion board)	Topics will be presented for discussion with the opportunity to provide commentary and feedback on fellow student responses.
E-mail	Email will be used for individual interaction between professor and student, to send group email reminders of deadlines, to inform of upcoming course content.
Video Conferencing	Zoom or comparable video conferencing software will be utilized to lecture on course content, demonstrate lab assignments, answer student questions in real time, and provide student assistance on anything that is course related.
Other DE (e.g., recorded lectures)	Any real-time instruction will be recorded and available to students through the LMS.

Examinations

Hybrid (1%–50% online) Modality
Online
On campus

Hybrid (51%–99% online) Modality
Online
On campus

Primary Minimum Qualification
COMPUTER INFORMATION SYS

Additional local certifications required
Microsoft Server operating system certification

Review and Approval Dates

Department Chair
08/21/2020

Dean
08/21/2020

Technical Review
08/26/2020

Curriculum Committee
08/26/2020

Curriculum Committee
11/25/2020

CCCCO
MM/DD/YYYY

Control Number
CCC000543435

DOE/accreditation approval date
MM/DD/YYYY