



El Camino College
COURSE OUTLINE OF RECORD – Official

Subject:	CIS
Course Number:	42
Descriptive Title:	Systems and Server Administration and Operations (SysOps)
Division:	Business
Department:	Computer Information Systems
Course Disciplines:	Computer Information Systems
Catalog Description:	In this course, students will develop the skills necessary to proactively defend and continuously improve the security of an organization. Students will install, configure, and manage server hardware and server operating systems, implement proper server hardening and security controls, successfully troubleshoot common server problems, and demonstrate an understanding of key disaster recovery, high-availability, and backup concepts. This class builds upon the knowledge from CIS 40, expanding upon previous concepts such as networks, virtualization, security, and ethical concerns within the information systems environment.
Prerequisite:	
Co-requisite:	CIS 40
Recommended Preparation:	CIS 13
Enrollment Limitation:	
Hours Lecture (per week):	2
Hours Laboratory (per week):	3
Outside Study Hours:	4
Total Course Hours:	90
Course Units:	3
Grading Method:	Letter Grade only
Credit Status:	Credit, degree applicable
Transfer CSU:	Yes
Effective Date:	
Transfer UC:	Yes
Effective Date:	
General Education ECC:	
Term:	
Other:	
CSU GE:	
Term:	
Other:	
IGETC:	

Term:	
Other:	
Cal-GETC:	
Term:	
Other:	
Student Learning Outcomes:	At the end of this course, students will be able to: 1. Identify a variety of server hardware and determine the appropriate components to acquire as well as managing various software to properly use that hardware. 2. Properly configure server hardware from proper firmware configurations to the network and operating systems, including additional components and utilities. This also includes virtualization and imaging software. 3. Understand and implement industry standard encryption on server systems, proper backup and disaster recovery procedures, recognize environmental control devices, and implement and administer physical security and safety controls. 4. Troubleshoot all managed services using industry standard tools and techniques for both the hardware and software.
Course Objectives:	1. Examine and determine appropriate server hardware for the use-case. 2. Understand the various storage systems available. 3. Demonstrate the ability to perform server installations and regular maintenance. 4. Compare and contrast the various server operating systems available. 5. Install and configure software such as utility programs used for diagnostic evaluation. 6. Demonstrate the ability to use software tools to troubleshoot and resolve problems. 7. Demonstrate the ability to implement and manage high-availability services. 8. Demonstrate the ability to deploy and manage virtual servers through scripting. 9. Understand licensing models. 10. Demonstrate the ability to implement hardware and software security controls. 11. Demonstrate the ability to implement proper backup and disaster recovery strategies. 12. Understand the troubleshooting methodology. 13. Examine the professional and ethical responsibilities facing the IT enabled organization including privacy, security, and disaster recovery.
Major Topics:	I. Server Hardware Installation & Management (8 hours, Lecture) A. Physical Hardware B. Storage Management C. Hardware Maintenance II. Server Administration (10 hours, Lecture) A. Server Operating Systems B. Server Networking C. Server Functions & Features D. High-Availability E. Virtualization F. Scripting & Automation G. Asset Management & Documentation H. Licensing III. Security & Disaster Recovery (10 hours, Lecture)

	A. Data vs. Physical Security B. Identity & Access Management C. Risk Management D. Server Hardening E. Server Decommissioning F. Disaster Recovery & Backups IV. Troubleshooting (8 hours, Lecture) A. Theory & Methodology B. Common Hardware Failures C. Storage Problems D. Common Operating System and Software Problems E. Common Network Connectivity Problems F. Common Security Problems V. Server Hardware Installation & Management (14 hours, Lab) A. Physical Hardware Installation B. Storage Installation C. Storage Configuration and Management D. Hardware Maintenance VI. Server Administration (15 hours, Lab) A. Server Operating Systems Installation B. Server Networking Configuration C. Server Functions & Features Exploration D. High-Availability Configuration and Requirements E. Virtualization Configuration and Optimization F. Introduction to Scripting & Automation G. Asset Management & Documentation H. Licensing Considerations VII. Security & Disaster Recovery (15 hours, Lab) A. Data vs. Physical Security Implementation B. Identity & Access Management Configuration C. Risk Management Practices D. Server Hardening Practices and Standards E. Disaster Recovery Planning F. Backup Strategies G. Backup Configuration and Implementation VIII. Troubleshooting (10 hours, Lab) A. Exploring Common Hardware Failures B. Data Recovery Tools C. Common Operating System and Software Problems D. Common Network Connectivity Problems E. Common Security Problems
Total Lecture Hours:	36
Total Laboratory Hours:	54
Total Hours:	90
A.1. Primary Methods of Evaluation (Part 1 - CCN courses only):	
Primary Method of Evaluation:	2) Problem solving demonstrations (computational or non-computational)

Typical Assignment Using Primary Method of Evaluation:	After reviewing the client's needs, determine the appropriate server specifications to deploy. Prepare a purchase request and 1-2 page report that addresses the following, including justifications: Racking enclosure size, railing and power requirements, networking requirements, server type, server components, storage requirements, type of storage medium, storage interface, basic security.
Critical Thinking Assignment 1:	Determine appropriate storage requirements. The goal of this assignment is to explore the various storage options available both in terms of hardware and software. During a class discussion with your peers, explore the different storage mediums available including the configuration options that are available such as RAID and ZFS. Explain the advantages and disadvantages of each including a situation where it would be most appropriate to use.
Critical Thinking Assignment 2:	Troubleshoot hardware failure. 1 page report following provided template. Using the troubleshooting methodology, document the steps necessary to determine which hardware component has failed in a particular system. Ensure you have completely isolated and identified the root cause and include steps necessary to mitigate the risk of failure in the future.
Other Evaluation Methods:	Class Performance, Laboratory Reports, Objective Exam, Quizzes
If Other:	
Instructional Methods:	Demonstration, Lab, Lecture, Multimedia presentations
If other:	
Work Outside of Class:	Answer questions, Problem solving activity, Required reading, Skill practice, Written work (such as essay/composition/report/analysis/research)
If Other:	
Up-To-Date Representative Texts:	Kinnaird, C. (2025). Fundamentals of server administration with ebook. Jones & Bartlett Learning LLC : Jones & Bartlett Learning.
Alternative Texts:	
Required Supplementary Readings:	
Other Required Materials:	
Requisite	Corequisite
Category	standard
Requisite course:	CIS 40
Requisite and Matching skill(s): Bold the requisite skill. List the corresponding course objective under each skill(s).	Demonstrate the ability to evaluate computer, operating systems, and applications software in relation to installing and configuring software on small networks. CIS 40 - Demonstrate the ability to evaluate computer, operating systems, and applications software in relation to installing and configuring software on small networks.
Requisite Skill:	
Requisite Skill and Matching skill(s): Bold	

the requisite skill(s), if applicable	
Requisite course:	CIS 13
Requisite and Matching skill(s): Bold the requisite skill. List the corresponding course objective under each skill(s).	Solve common business problems using appropriate information technology applications and systems. CIS 13: Solve common business problems using appropriate information technology applications and systems.
Requisite Skill:	
Requisite Skill and Matching skill(s): Bold the requisite skill. List the corresponding course objective under each skill(s), if applicable	
Enrollment Limitations and Category:	
Enrollment Limitations Impact:	
Course Created by:	Martin Anaya
Date:	10/9/2025
Original Board Approval Date:	
Effective Term:	FA 2026