

Credit Hours: 3

Contact Hours: This is a 3-credit course, offered in accelerated format. This means that 16 weeks of material is covered in 8 weeks. The exact number of hours per week that you can expect to spend on each course will vary based upon the weekly coursework, as well as your study style and preferences. You should plan to spend 14-20 hours per week in each course reading material, interacting on the discussion boards, writing papers, completing projects, and doing research.

Faculty Information: Faculty contact information and office hours can be found on the faculty profile page.

COURSE DESCRIPTION AND OUTCOMES

COURSE DESCRIPTION:

This course provides an overview of operating systems and system architecture. Primary emphasis is on I/O systems, file systems, storage, loading, security and memory allocation. Multiple operating systems will be explored and applied throughout the course. Students will be able to contrast kernel mode and user mode as they relate to designing and implementing operating systems.

COURSE OVERVIEW:

CSC300 examines the intricacies of operating systems as well as key operating system features and architecture. Students will gain a working knowledge of operating systems and operating system design including command line and graphical user interface concepts, file management, process control, directory structure, file system implementation, virtual memory, managing devices and security. Students will demonstrate competency in the application of operating systems and design concepts by completing critical thinking assignments, portfolio projects, and scenario-based exercises.

COURSE LEARNING OUTCOMES:

1. Discuss the factors of computer architecture that affect system performance.
2. Identify techniques to improve operating system efficiency.
3. Describe the differences between the kernel and user mode in developing key approaches to operating system design and implementation.
4. Implement methods that can be used to improve the operating system environment.
5. Use system commands to manage I/O systems and file systems in an operating system environment.

PARTICIPATION & ATTENDANCE

Prompt and consistent attendance in your online courses is essential for your success at CSU-Global Campus. Failure to verify your attendance within the first 7 days of this course may result in your withdrawal. If for some reason you would like to drop a course, please contact your advisor.

Online classes have deadlines, assignments, and participation requirements just like on-campus classes. Budget your time carefully and keep an open line of communication with your instructor. If you are having technical problems, problems with your assignments, or other problems that are impeding your progress, let your instructor know as soon as possible.

COURSE MATERIALS

Required:

- Silberschatz, A., Galvin, P. B., & Gagne, G. (2018). *Operating system concepts* (10th ed.). Hoboken, NJ: Wiley. ISBN 9781119456339

NOTE: All non-textbook required readings and materials necessary to complete assignments, discussions, and/or supplemental or required exercises are provided within the course itself. Please read through each course module carefully.

COURSE SCHEDULE

Due Dates

The Academic Week at CSU-Global begins on Monday and ends the following Sunday.

- **Discussion Boards:** The original post must be completed by Thursday at 11:59 p.m. MT and peer responses posted by Sunday 11:59 p.m. MT. Late posts may not be awarded points.
- **Opening Exercises:** Take the Opening Exercise before reading each week's content to see which areas you will need to focus on. You may take these exercises as many times as you need. The Opening Exercises will not affect your final grade.
- **Mastery Exercises:** Students may access and retake Mastery Exercises through the last day of class until they achieve the scores they desire.
- **Critical Thinking:** Assignments are due Sunday at 11:59 p.m. MT.

WEEKLY READING AND ASSIGNMENT DETAILS

MODULE 1

Readings

- Chapters 1 & 2 in *Operating System Concepts*

Opening Exercise (0 points)

Discussion (25 points)

Mastery Exercise (10 points)

Critical Thinking (50 points)

Option #1: Resources Managed by Operating Systems

An operating system (OS) is a program that manages computer resources, including input/output devices, CPU, storage, and memory. It is responsible for several actions a computer performs. In a well-written paper, drawing on this week's readings choose three resources that are managed by the

operating system. Describe how the operating systems manages those resources in a standard computer environment.

Your paper should meet the following requirements:

- Be 2-3 pages in length not including the title and reference pages.
- Include at least three credible and scholarly references from the readings or outside sources. The CSU-Global Library is a good place to find your sources.
- Follow the CSU-Global Guide to Writing and APA.

Option #2: Operating System Activities

Write a short 2-3 page critical essay answering the following questions.

1. What are two activities the operating system is responsible for in connection with disk management?
2. What are the two basic goal groups that must be considered when designing an operating system?
 - Discuss and cite the course material and at least one additional credible or scholarly source to support your analysis and positions. The CSU-Global Library is a good place to find credible and scholarly sources.
 - Your paper should be 2-3 pages in length not including the title and reference pages.
 - Your paper should follow the document and citation formatting per the CSU-Global Guide to Writing and APA.

MODULE 2

Readings

- Chapters 3-5 in *Operating System Concepts*

Opening Exercise (0 points)

Discussion (25 points)

Mastery Exercise (10 points)

Critical Thinking (60 points)

Option #1: Multi-threaded Computer Systems

Threads are a fundamental unit of CPU utilization that form the basis of multi-threaded computer systems. Write a short 2-3 page critical essay detailing the purpose of threads. Be sure to elaborate on multicore systems and parallel programming.

Your paper should meet the following requirements:

- Be 2-3 pages in length not including tile and reference pages.
- Include at least three references from the readings or outside sources. You can cite the course material and at least one additional credible or scholarly source must be included to support your analysis and positions. The CSU-Global Library is a good place to find your sources.
- Follow the CSU-Global Guide to Writing & APA.

Option #2: Multithreading Models

Write a short 2-3 page critical essay answering the following questions.

1. What are Multithreading Models? Elaborate on at least three different types and the service each provides.
2. What are the 5 areas that present challenges in programming for multicore systems? What challenges do they present?

Your paper should meet the following requirements:

- Be 2-3 pages in length not including title and reference pages.
- Include at least three references from the readings or outside sources. You can cite the course material and at least one additional credible or scholarly source must be included to support your analysis and positions. The CSU-Global Library is a good place to find your sources.
- Follow the CSU-Global Guide to Writing & APA.

MODULE 3

Readings

- Chapters 6-8 in *Operating System Concepts*

Opening Exercise (0 points)

Discussion (25 points)

Mastery Exercise (10 points)

Critical Thinking (65 points)

Option #1: Deadlocks

A deadlock is a condition in which two computer programs sharing the same resource prevent each other from accessing the resource, resulting in both programs terminating. Write a short 2-3 page critical essay explaining deadlocks, include deadlock characteristics and preventions and avoidance.

Discuss and cite the course material and at least one additional credible or scholarly source to support your analysis and positions.

Your paper should meet the following requirements:

- Be 2-3 pages in length not including title and reference pages.
- Include at least three references from the readings or outside sources. You can cite the course material and at least one additional credible or scholarly source must be included to support your analysis and positions. The CSU-Global Library is a good place to find your sources.
- Follow the CSU-Global Guide to Writing & APA.

Option #2: Synchronization

Write a short 2-3 page critical essay answering the following questions

1. What synchronization issues are found in operating systems?
2. What tools are used by Linux and Windows to resolve synchronization issues?

Your paper should meet the following requirements:

- Be 2-3 pages in length not including title and reference pages.
- Include at least three references from the readings or outside sources. You can cite the course material and at least one additional credible or scholarly source must be included to support your analysis and positions. The CSU-Global Library is a good place to find your sources.
- Follow the CSU-Global Guide to Writing & APA.

MODULE 4

Readings

- Chapters 9 & 10 in *Operating System Concepts*

Opening Exercise (0 points)

Discussion (25 points)

Mastery Exercise (10 points)

Critical Thinking (65 points)

Option #1: Memory Management

Memory management in operating systems encompasses the coordination and control of computer memory systems and the optimization of total system performance through efficient memory storage. Write a short 2-3 page critical essay explaining memory management principles including memory-management algorithm, memory-management methods, and the difference between a logical and a physical address in the role of the memory management.

Your paper should meet the following requirements:

- Be 2-3 pages in length not including title and reference pages.
- Include at least three references from the readings or outside sources. You can cite the course material and at least one additional credible or scholarly source must be included to support your analysis and positions. The CSU-Global Library is a good place to find your sources.
- Follow the CSU-Global Guide to Writing & APA.

Option #2: Virtual Memory

Write a short 2-3 page critical essay answering the following questions.

1. What is the difference between virtual and physical memory? List the purpose of each within an operating system.
2. How do operating systems like Linux, Windows, and Solaris manage virtual memory?

Your paper should meet the following requirements:

- Be 2-3 pages in length not including title and reference pages.
- Include at least three references from the readings or outside sources. You can cite the course material and at least one additional credible or scholarly source must be included to support your analysis and positions. The CSU-Global Library is a good place to find your sources.
- Follow the [CSU-Global Guide to Writing & APA](#).

MODULE 5

Readings

- Chapters 11 & 12 in *Operating System Concepts*

Opening Exercise (0 points)

Discussion (25 points)

Live Classroom (0 points)

Mastery Exercise (10 points)

Critical Thinking (65 points)

Option #1: Mass Storage Devices

Mass storage devices are those devices on your system available for storing large amounts of data. Some of the common MSDs include, disk drives, optical drives, external hard drives, tape drives, USB and RAID. Write a short 2-3 page critical essay explaining the advantages and disadvantages of these devices.

Your paper should meet the following requirements:

- Be 2-3 pages in length not including title and reference pages.
- Include at least three references from the readings or outside sources. You can cite the course material and at least one additional credible or scholarly source must be included to support your analysis and positions. The CSU-Global Library is a good place to find your sources.
- Follow the CSU-Global Guide to Writing & APA.

Option #2: I/O Subsystems

Write a short 2-3 page critical essay answering the following questions.

1. What is the purpose of a controller?
2. What services are provided by the kernel I/O subsystem?

Your paper should meet the following requirements:

- Be 2-3 pages in length not including title and reference pages.
- Include at least three references from the readings or outside sources. You can cite the course material and at least one additional credible or scholarly source must be included to support your analysis and positions. The CSU-Global Library is a good place to find your sources.
- Follow the CSU-Global Guide to Writing & APA.

MODULE 6

Readings

- Chapters 13-15 in *Operating System Concepts*

Opening Exercise (0 points)

Discussion (25 points)

Mastery Exercise (10 points)

Critical Thinking (65 points)

Option #1: Mounting

Mounting confirms that your computer knows the media's format; if your computer cannot identify that format, the device cannot be mounted. When media is mounted, your computer includes the media's file system into your local file system, and makes a mount point, a locally available link through which you access an external device.

Write a short 2-3 page critical essay explaining the advantages and disadvantages of mounting drives and specific instances.

Your paper should meet the following requirements:

- Be 2-3 pages in length not including title and reference pages.
- Include at least three references from the readings or outside sources. You can cite the course material and at least one additional credible or scholarly source must be included to support your analysis and positions. The CSU-Global Library is a good place to find your sources.
- Follow the CSU-Global Guide to Writing & APA.

Option #2: File Types

Write a short 2-3 page critical essay answering the following questions.

1. What purpose do the seven basic files operations serve regarding a file?
2. How are file types used to indicate the internal structure of a file?

Your paper should meet the following requirements:

- Be 2-3 pages in length not including title and reference pages.
- Include at least three references from the readings or outside sources. You can cite the course material and at least one additional credible or scholarly source must be included to support your analysis and positions. The CSU-Global Library is a good place to find your sources.
- Follow the CSU-Global Guide to Writing & APA.

MODULE 7

Readings

- Chapters 16 & 17 in Operating System Concepts

Opening Exercise (0 points)

Discussion (25 points)

Mastery Exercise (10 points)

MODULE 8

Readings

- Chapters 18 & 19 in Operating System Concepts

Opening Exercise (0 points)

Discussion (25 points)

Mastery Exercise (10 points)

Portfolio Project (350 points)

Option #1: Propose an Enterprise-wide Upgrade Solution for an Organization

Assume you are a consultant for a local business that has asked you to propose an enterprise-wide upgrade solution that includes operating systems, mass storage, virtualization and security. The company currently has a mix of operating systems including several legacy machines. The company does not currently use virtual machines but is strongly considering them. The company's core business is software testing but is considering offering a storage solution.

Your proposal should address the following concerns and questions presented by stakeholders.

- Are there any benefits in upgrading their corporate Operating Systems from Windows 8.1 to Windows 10?
- Is there a way of preventing deadlocks from occurring? If they cannot be prevented is it possible to recover from Deadlocks?
- Considering the Windows and Linux operating systems which OS would be preferred for NAS and why?

Your paper should also meet the following requirements:

- Be 8-10 pages in length.
- Include at least three references from the readings or outside sources. You can cite the course material and at least one additional credible or scholarly source must be included to support your analysis and positions. The CSU-Global Library is a good place to find your sources.
- Follow the CSU-Global Guide to Writing & APA.

Option #2: Upgrade an OS that Uses a Many-to-Many Model or Many-to-One Model

Currently OS/2, windows NT and windows 2000 are used in the labs for testing, each uses a one to one relationship model. Is there a benefit in upgrading to an OS that uses a many-to-many model or many-to-one model? If so expound on the advantages and which OS would be suitable.

- What solution would you recommend for Mass-Storage?
- Is RAID a viable option for Mass Storage if so which level do you recommend, and why?
- What VM solutions are available and would it be advantageous to use (VMM) Virtual Machine Manager?
- What storage Virilization solution would you recommend?
What software and hardware components would you recommend for network security?
- Would Linux be considered more secure than Windows and are the file systems similar?

Your paper should also meet the following requirements:

- Be 8-10 pages in length.
- Include at least three references from the readings or outside sources. You can cite the course material and at least one additional credible or scholarly source must be included to support your analysis and positions. The CSU-Global Library is a good place to find your sources.
- Follow the CSU-Global Guide to Writing & APA.

COURSE POLICIES

Course Grading

20% Discussion Participation
0% Opening Exercises
8% Mastery Exercises
37% Critical Thinking Assignments
35% Final Portfolio Project

Grading Scale	
A	95.0 – 100
A-	90.0 – 94.9
B+	86.7 – 89.9
B	83.3 – 86.6
B-	80.0 – 83.2
C+	75.0 – 79.9
C	70.0 – 74.9
D	60.0 – 69.9
F	59.9 or below

IN-CLASSROOM POLICIES

For information on late work and incomplete grade policies, please refer to our [In-Classroom Student Policies and Guidelines](#) or the Academic Catalog for comprehensive documentation of CSU-Global institutional policies.

Academic Integrity

Students must assume responsibility for maintaining honesty in all work submitted for credit and in any other work designated by the instructor of the course. Academic dishonesty includes cheating, fabrication, facilitating academic dishonesty, plagiarism, reusing /repurposing your own work (see *CSU-Global Guide to Writing and APA Requirements* for percentage of repurposed work that can be used in an assignment), unauthorized possession of academic materials, and unauthorized collaboration. The CSU-Global Library provides information on how students can avoid plagiarism by understanding what it is and how to use the Library and Internet resources.

Citing Sources with APA Style

All students are expected to follow the *CSU-Global Guide to Writing and APA Requirements* when citing in APA (based on the APA Style Manual, 6th edition) for all assignments. For details on CSU-Global APA style, please review the APA resources within the CSU-Global Library under the “APA Guide & Resources” link. A link to this document should also be provided within most assignment descriptions in your course.

Disability Services Statement

CSU-Global is committed to providing reasonable accommodations for all persons with disabilities. Any student with a documented disability requesting academic accommodations should contact the Disability Resource Coordinator at 720-279-0650 and/or email ada@CSUGlobal.edu for additional information to coordinate reasonable accommodations for students with documented disabilities.

Netiquette

Respect the diversity of opinions among the instructor and classmates and engage with them in a courteous, respectful, and professional manner. All posts and classroom communication must be conducted in accordance with the student code of conduct. Think before you push the Send button. Did you say just what you meant? How will the person on the other end read the words?

Maintain an environment free of harassment, stalking, threats, abuse, insults, or humiliation toward the instructor and classmates. This includes, but is not limited to, demeaning written or oral comments of an ethnic, religious, age, disability, sexist (or sexual orientation), or racist nature; and the unwanted sexual advances or intimidations by email, or on discussion boards and other postings within or connected to the online classroom. If you have concerns about something that has been said, please let your instructor know.