

Metropolitan State University of Denver

Regular Course Syllabus

CS - 3600 - Operating Systems		Fall 2016
Status	completed	
Tracking:	LAS 1617-46	
Department	Mathematical and Computer Sciences, Department of	
Status:	Active-Visible	
Prefix:	CS	
Course Number:	3600	
Course Type:	Computer Science	
Course Title:	Operating Systems	
Transcript Course Title:	Operating Systems	
Check All That Apply:	Required for Major	
Credit Hours:	4	
Schedule Type:	Lecture	
Grade Mode:	Letter	
Lecture:	60	
Lab:		
Internship:		
Practicum:		
Other:		
Additional Student Work Hours per course:	120	
Variable topics umbrella course:	No	
If yes, number of credits/ repeats allowed		
Specified repeatable course:	No	
If yes, number of credits/ repeats allowed		
Prerequisite(s):	CS 2050, CS 2400, and CS 3250, all with grades of "C" or better; or permission of instructor	
Corequisite(s):		
Prerequisite(s) and/or Corequisite(s):		
Banner Prerequisite(s):		
Banner Corequisite(s):		
Banner Prerequisite(s) and/or Corequisite(s):		
Level	Undergraduate	
Class		
Program/Major		
Student attribute		
Catalog Course Description:	This course provides an introduction to modern computer operating systems, their use, design, development, and implementation. Topics covered include: operating system modes, structuring methods, process and thread scheduling and dispatch, concurrency, inter-process communication, memory management, file system organization (in both stand-alone and networked environments), and	

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	system security. Students are required to write programs that implement some operating system functions.
Required Reading and Other Materials will be equivalent to:	Silberschatz, Galvin, and Gagne (2012), Operating System Concepts, 8th update edition, Hoboken, NJ, Wiley & Sons
Specific, Measurable Student Behavioral Learning Objectives:	<p>Upon completion of this course the student should be able to:</p> <ol style="list-style-type: none"> 1. Identify and describe the objectives, functions, and alternative structures of modern operating systems. 2. Describe in detail the scheduling and dispatching functions of operating systems. 3. Explain state diagrams depicting processes and threads created by the operating system and the run-time environment. 4. Choose an appropriate synchronization model for a specific concurrent application. 5. Compare and contrast different approaches to file organization. 6. Describe detailed implementations of memory hierarchy and virtual memory. 7. Defend the need for protection and security in operating systems and summarize the associated features and limitations of contemporary operating systems. 8. Create software that implements some of the operating system functionality: for example, multithreading, scheduling and synchronization, virtual memory organization, or security and access control.
Detailed Outline of Course Content (Major Topics and Subtopics) or Outline of Field Experience/ Internship	<ol style="list-style-type: none"> I. Operating Systems: Structure and Principles <ol style="list-style-type: none"> A. Functionality of a typical operating system B. OS modes: batch, multitasking, time-sharing C. Influences of security, networking, multimedia, windows D. Structuring methods (monolithic, layered, modular, micro-kernel, object-oriented models) E. Abstractions, virtual machines II. Scheduling and Dispatch <ol style="list-style-type: none"> A. Processes and threads B. States and state diagrams, process control blocks C. Dispatching and context switching D. Preemptive and non-preemptive scheduling III. Concurrency <ol style="list-style-type: none"> A. The mutual exclusion problem and some solutions B. Models and mechanisms (semaphores, monitors, condition variables, rendezvous) C. Deadlock: causes, conditions, prevention D. Theoretical synchronization models IV. Memory Management <ol style="list-style-type: none"> A. Main memory: swapping, paging, segmentation B. Virtual memory V. File System <ol style="list-style-type: none"> A. Files and directories B. File systems: partitioning, mount/unmount, virtual file systems C. Standard implementation techniques VI. OS Security <ol style="list-style-type: none"> A. Overview of system security B. Security methods and devices C. Protection, access control, and authentication

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Evaluation of Student Performance	A combination of the following: 1. Homework and Programming Projects 2. Quizzes and Examinations 3. Research Papers and/or Book Reports 4. Oral Presentations 5. Final Examination		
Learning Objectives			
Distribution of Credit Hours	(4 + 0)		
Steps	Edits	Decision	Date
Originator			
Gerald Shultz	2	approve	10/03/2016 04:29PM
Department Curriculum Committee Chair			
Clark Dollard	0	approve	10/05/2016 03:18PM
Department Chair			
Lindsay Packer	1	approve	10/06/2016 10:27AM
Dean's Office Tracking Assignment			
Kelsey Smith	1	approve	10/06/2016 02:56PM
Substantive College Level			
Gerald Shultz	5	approve	12/09/2016 09:36AM
Linda Lang-Peralta	0	approve	12/15/2016 04:57PM
Mona Mocanasu	1	approve	12/14/2016 10:47AM
Faculty Senate President			
Matthew Makley	0	None	
Erica Buckland	0	force-approve	12/22/2016 09:29AM
AVP Academic and Student Affairs			
Bernice Harris	1	approve	12/22/2016 10:02AM