

# CSC 139: OPERATING SYSTEM PRINCIPLES

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## In Workflow

1. CSC Committee Chair (shaverdian@csus.edu;%20jouyang@csus.edu)
2. CSC Chair (faroughi@csus.edu)
3. ECS College Committee Chair (figgess@csus.edu)
4. ECS Dean (kevan@csus.edu)
5. Academic Services (torsetj@csus.edu;%20cnewsome@skymail.csus.edu)
6. Senate Curriculum Subcommittee Chair (curriculum@csus.edu)
7. Dean of Undergraduate (james.german@csus.edu;%20celena.showers@csus.edu)
8. Dean of Graduate (cnewsome@skymail.csus.edu)
9. Catalog Editor (torsetj@csus.edu)
10. Registrar's Office (w lindsey@csus.edu)
11. PeopleSoft (PeopleSoft@csus.edu)

## Approval Path

1. Mon, 12 Oct 2020 22:36:23 GMT  
Anna Baynes (shaverdian): Approved for CSC Committee Chair
2. Mon, 12 Oct 2020 23:26:54 GMT  
Nikrouz Faroughi (faroughi): Rollback to CSC Committee Chair for CSC Chair
3. Tue, 13 Oct 2020 05:00:36 GMT  
Anna Baynes (shaverdian): Approved for CSC Committee Chair
4. Tue, 13 Oct 2020 15:32:04 GMT  
Nikrouz Faroughi (faroughi): Approved for CSC Chair
5. Fri, 16 Oct 2020 17:48:08 GMT  
Gareth Figgess (figgess): Rollback to CSC Committee Chair for ECS College Committee Chair
6. Tue, 20 Oct 2020 06:42:25 GMT  
Anna Baynes (shaverdian): Approved for CSC Committee Chair
7. Tue, 20 Oct 2020 16:46:14 GMT  
Nikrouz Faroughi (faroughi): Approved for CSC Chair
8. Fri, 23 Oct 2020 18:21:23 GMT  
Gareth Figgess (figgess): Approved for ECS College Committee Chair
9. Fri, 23 Oct 2020 18:34:29 GMT  
Kevan Shafizadeh (kevan): Approved for ECS Dean

Date Submitted: Sun, 04 Oct 2020 17:33:23 GMT

## Viewing: CSC 139 : Operating System Principles

Last edit: Tue, 20 Oct 2020 06:41:55 GMT

Changes proposed by: Ghassan Shobaki (218651863)

### Contact(s):

| Name (First Last) | Email                    | Phone 999-999-9999 |
|-------------------|--------------------------|--------------------|
| Ghassan Shobaki   | ghassan.shobaki@csus.edu | 916-278-7952       |

### Catalog Title:

Operating System Principles

### Class Schedule Title:

Operating System Principles

### Academic Group: (College)

ECS - Engineering & Computer Science

### Academic Organization: (Department)

Computer Science

### Will this course be offered through the College of Continuing Education (CCE)?

No

**Catalog Year Effective:**

Spring 2021 (2021/2022 Catalog)

**Subject Area: (prefix)**

CSC - Computer Science

**Catalog Number: (course number)**

139

**Course ID: (For administrative use only.)**

112026

**Units:**

3

**In what term(s) will this course typically be offered?**

Fall, Spring

**Does this course require a room for its final exam?**

Yes, final exam requires a room

**Does this course replace an existing experimental course?**

No

**This course complies with the credit hour policy:**

Yes

**Justification for course proposal:**

1. The prerequisite change is to avoid students worried about failing their current course from occupying enrollment. Our current course waitlists are filled.
2. The Computer Science department reviewed our courses based on current teaching practice and professional organization recommendations. This update is required for Computer Science program external accreditation.

**Course Description: (Not to exceed 80 words and language should conform to catalog copy.)**

Concepts, principles, fundamental issues, organization and structure of contemporary operating systems. Topics include processes, threads, concurrency, parallelism on multi-processor and multi-core systems, CPU scheduling, inter-process communication and synchronization, deadlocks, real and virtual memory management, device management, file systems, security, and protection. Lecture three hours.

**Are one or more field trips required with this course?**

No

**Fee Course?**

No

**Is this course designated as Service Learning?**

No

**Does this course require safety training?**

No

**Does this course require personal protective equipment (PPE)?**

No

**Does this course have prerequisites?**

Yes

**Prerequisite:**

CSC 60 and CSC 130 and either CSC 137 or CPE 185. Not currently enrolled in CSC 139.

**Prerequisites Enforced at Registration?**

No

**Does this course have corequisites?**

No

**Graded:**

Letter

**Approval required for enrollment?**

No Approval Required

**Course Component(s) and Classification(s):**

Discussion

**Discussion Classification**

CS#04 - Lecture /Recitation (K-factor=1 WTU per unit)

**Discussion Units**

3

**Is this a paired course?**

No

**Is this course crosslisted?**

No

**Can this course be repeated for credit?**

No

**Can the course be taken for credit more than once during the same term?**

No

**Description of the Expected Learning Outcomes: Describe outcomes using the following format: 'Students will be able to: 1), 2), etc.'**

Students completing this course will be able to

1. Explain the principles of concurrency and the trade-offs in synchronization approaches, and apply different synchronization approaches to the critical section problem and to process coordination.
2. Articulate different methods for handling deadlocks and starvations.
3. Outline issues, principles, performance criteria, and pros/cons of various operating systems algorithms for managing different types of system resources.
4. Write multi-process and multi-thread programs to solve concurrency control and synchronization problems using various types of system calls, API calls, semaphores, mutex locks, condition variables, and IPC methods in Unix/Linux environments.
5. Identify the security issues in operating systems and how to design around them.
6. Fully explain how a process and its memory are managed by an operating system.
7. Apply concepts and practices for virtualization of computing hardware.
8. Give detailed information about file systems in modern operating systems.

**Assessment Strategies: A description of the assessment strategies (e.g., portfolios, examinations, performances, pre-and post-tests, conferences with students, student papers) which will be used by the instructor to determine the extent to which students have achieved the learning outcomes noted above.**

Examinations and programming assignments (ELO's 1-8)

**Is this course required in a degree program (major, minor, graduate degree, certificate?)**

Yes

**Has a corresponding Program Change been submitted to Workflow?**

No

**Identify the program(s) in which this course is required:****Programs:**

BS in Computer Science

BS in Computer Engineering

**Does the proposed change or addition cause a significant increase in the use of College or University resources (lab room, computer)?**

No

**Will there be any departments affected by this proposed course?**

No

**I/we as the author(s) of this course proposal agree to provide a new or updated accessibility checklist to the Dean's office prior to the semester when this course is taught utilizing the changes proposed here.**

I/we agree

## **University Learning Goals**

**Undergraduate Learning Goals:**

Competence in the disciplines  
Intellectual and practical skills

**Is this course required as part of a teaching credential program, a single subject, or multiple subject waiver program (e.g., Liberal Studies, Biology) or other school personnel preparation program (e.g., School of Nursing)?**

No

## **GE Course and GE Goal(s)**

**Is this a General Education (GE) course or is it being considered for GE?**

No

**Please attach any additional files not requested above:**

outline-139-updated-v5 (3).docx

**Reviewer Comments:**

**Nikrouz Faroughi (faroughi) (Mon, 12 Oct 2020 23:26:54 GMT):** Rollback: update

**Gareth Figgess (figgess) (Fri, 16 Oct 2020 17:48:08 GMT):** Rollback: Update Syllabus

Key: 1042