

---

## OPERATING SYSTEMS in Spring 2021 (CS3032)

|                       |                                                          |                         |                   |
|-----------------------|----------------------------------------------------------|-------------------------|-------------------|
| <b>Course Code</b>    | CS3032                                                   | <b>Professor(s)</b>     | Georgi Stojanov   |
| <b>Prerequisites</b>  | None                                                     | <b>Office Number</b>    | PL107             |
| <b>Class Schedule</b> | M: 10:35-11:55 in<br>Q-604<br>R: 15:20-16:40 in<br>Q-604 | <b>Office Hours</b>     | by appointment    |
| <b>Credits</b>        | 4                                                        | <b>Email</b>            | gstojanov@aup.edu |
| <b>Semester</b>       | Spring 2021                                              | <b>Office Tel. Ext.</b> | NA                |

## Course Description

---

**Synopsis from course catalog:** Studies the design and implementation of general purpose operating systems on digital computers: memory management, virtual memory, storage hierarchy evaluation, multiprogramming, process creation, synchronization, deadlock, message communication, parallel programming constructs, I/O management, file systems. Includes case studies of major operating systems.

**General Topic:** Architecture, design, and implementation of general--purpose operating systems for digital computers.

### Individual Topics:

- Overview of Operating Systems structure and their historical development
- Digital Computers Architecture
- Hardware abstraction
- Processes, Jobs, Tasks
- CPU time scheduling
- Process synchronization and deadlocks
- Memory management
- File systems
- I/O management
- Case studies of major OS

## Course Learning Outcomes

---

Students will be familiar with the architecture of digital computers

---

Students will learn about the main components of the modern operating systems for digital computers.

They will know the historical development of essential concepts underlying these OS as well as the crucial issues in OS design and implementation.

Students will understand and be able to explain the evolution and objectives of OS

Students will be able to identify the main components of most modern multi-user, multi-process OS Students will understand the relations among these components as well as be aware of the most probable causes of malfunctioning or suboptimal performance of the OS.

The notions of process, process synchronization, CPU scheduling, memory management, I/O systems will be explored in depth.

They will be familiar with some of the best practices for general purpose OS design and implementation

Students will have working knowledge as well as the basic administration task in of unixoid Operating Systems

## General Education

---

N/A

## Course Outline

---

### COURSE    OUTLINE:

| Week | Topic |
|------|-------|
|------|-------|

|   |                          |
|---|--------------------------|
| 1 | <b><i>Session I,</i></b> |
|---|--------------------------|

|           |                                                                                                     |
|-----------|-----------------------------------------------------------------------------------------------------|
| 13<br>Jan | <b><i>Class presentation; content and form; assessment and grading policies; administrative</i></b> |
|-----------|-----------------------------------------------------------------------------------------------------|

|  |                           |
|--|---------------------------|
|  | <b><i>Session II,</i></b> |
|--|---------------------------|

|  |                                                                            |
|--|----------------------------------------------------------------------------|
|  | <b>Logical gates; implementation of Boolean Functions; Universal Gates</b> |
|--|----------------------------------------------------------------------------|

|   |                         |
|---|-------------------------|
| 2 | <b><i>Session I</i></b> |
|---|-------------------------|

|        |                                                |
|--------|------------------------------------------------|
| 20 Jan | <b>Practice combinatorial logical circuits</b> |
|--------|------------------------------------------------|

|  |                            |
|--|----------------------------|
|  | <b><i>- Session II</i></b> |
|--|----------------------------|

---

3

27

Jar

## Session II

## Process and CPU time—management 1

4

3

Feb

## Session II

## Process synchronization and deadlocks

5

10

Feb

## Session II

## Memory management 2

17

28

Fek

63

Ma

## File systems 1

## Session II

## File systems 2

---

**Session II Midterm exam**

7  
10  
March

**Session I**

**I/O management**

**Session II**

**Case Studies 1: DOS**

8  
17  
March

**Session I**

**Case Studies 1: DOS**

**Session II**

**Case Studies 1: DOS**

9  
24  
March

**Session I**

**Case Studies 2: Unix**

**Session II**

**Case Studies 2: Unix**

10

**Session I Test 3 Session II**

31  
ch

Mar **Final Projects discussion and definition**

11  
5  
pril

**Session I**

A

**Students presenting individual Final projects ideas**

**Session II**

**Working on the final projects**

---

12            **Session I Test 4 Session II**

12        Apri **Practice for the final**  
I

19            **Session I**

7            **Final projects presentations**  
May

**NOTE:**

The schedule is flexible and may be revisited as the course progresses.

## **Textbooks**

---

This course doesn't have any textbook.

## **Attendance Policy**

---

Students are expected to attend all classes, to arrive ahead of time, and to leave after the bell. Missed classes and tardiness create learning gaps, which may lead to failure of mastering the material, and incur a loss of time for the student, her peers and the professor altogether. For additional information, please refer to the **Absence Policy** below.

### **AUP Attendance Policy**

Students studying at The American University of Paris are expected to attend ALL scheduled classes, and in case of absence, should contact their professors to explain the situation. It is the student's responsibility to be aware of any specific attendance policy that a faculty member might have set in the course syllabus. The French Department, for example, has its own attendance policy, and students are responsible for compliance. Academic Affairs will excuse an

---

absence for students' participation in study trips related to their courses.

Attendance at all exams is mandatory.

IN ALL CASES OF MISSED COURSE MEETINGS, THE RESPONSIBILITY FOR COMMUNICATION WITH THE PROFESSOR, AND FOR ARRANGING TO MAKE UP MISSED WORK, RESTS SOLELY WITH THE STUDENT.

Whether an absence is excused or not is ALWAYS up to the discretion of the professor or the department. Unexcused absences can result in a low or failing participation grade. In the case of excessive absences, it is up to the professor or the department to decide if the student will receive an "F" for the course. An instructor may recommend that a student withdraw, if absences have made it impossible to continue in the course at a satisfactory level.

Students must be mindful of this policy when making their travel arrangements, and especially during the Drop/Add and Exam Periods.

## Grading Policy

---

### Assessment Components:

**(20%) Homework** (-1% for each unexcused lateness)

**(30%) Laboratory work** (-1% for each unexcused lateness)

**(10%) Mid-term examination**

**(10%) Quizzes and in class participation (30%) Final examination** Grade Scales:

|                    |                               |
|--------------------|-------------------------------|
| <b>[A+, A, A-]</b> | <b>= [95, 93, 90] %</b>       |
| <b>[B+, B, B-]</b> | <b>= [86, 82, 78] %</b>       |
| <b>[C+, C, C-]</b> | <b>= [72, 63-71, 57-62] %</b> |
| <b>[D+, D, D-]</b> | <b>= [56, 52, 48] %</b>       |
| <b>[F]</b>         | <b>= [47 or below] %</b>      |

## Other

---

---

## **IMPORTANT**

**BE PROACTIVE. READ THE ASSIGNED TEXTS. DO YOUR HOMEWORK AT *HOME*. ASK FOR HELP VIA EMAIL: REPLY GUARANTEED WITHIN HOURS AND NEVER BEYOND 24 HRS. WORK IN GROUP IS ENCOURAGED BUT YOU ALWAYS SUBMIT INDIVIDUALLY.**