Dept. of Computer Science and Information Systems– CSIS
College of Arts and Sciences

CSIS 310 – Introduction to Operating Systems
Spring 2018

Course Syllabus

General Course Information

Instructor   Dr.Nooh Bany Muhammad
Office   A340
Phone   1802040 – ext: 3713
Email   nmuhammad@auk.edu.kw
Office Hours UR 1:00 - 3:30 & T 4:00- 5:00
Classroom   A107
Class time   UR 3:30 – 4:45

Course Description

This course introduced students to the study of supervisory programs. The course will, start with a brief historical perspective of the evolution of operating systems and then cover the major components of the most operating systems such as process management (processed, threads, CPU scheduling, synchronization, and deadlock), memory management (segmentation, paging, swapping), files systems; and operating system support for distributed systems. This course will allow students to have an opportunity to learn a lot of practical information about how programming languages, such as: Java, C and C++, operating system, and architectures interact and how to use each effectively. Students will also gain an experience on how to use Linux as an operating system.

Course Prerequisites

CSIS 210.

Course Outcomes

Upon completion of this course the student should:

1) Understand what an operating system is, what its purpose is, and what its components are. [Abet 1]

2) Evaluate and compare scheduling algorithms on real scenarios. [Abet 1]

3) Identify and rectify synchronization problems. [Abet 2]

4) Differentiate between deadlock and non-deadlock situations. [Abet 1,2]

5) Evaluate a number of memory management techniques on the basis of memory utilization. [Abet 1]

6) Write programming assignments demonstrating the concepts of shared memory, process scheduling, page replacement and deadlocks. [Abet 2]

7) Describe file system concepts, access methods, different directory structures and file systems implementation [Abet 2]

8) Use of Linux operating system [Abet 6]

9) Create and run bash scripts [Abet 2, 6]

Textbook and Course Material

- **Required text**
  - Operating Systems Concepts, 9th Edition (International edition), Silberschatz A., Galvin P. and Gagne G.; John Wiley & Sons Inc., 2013.
  - Linux for Programmers and Users, Glass G. and Ables K.: Pearson, 2007.

- **Recommended Texts & Other Readings**

Modern Operating Systems, 4th Edition (Global edition), Tanenbaum A. and Bos H.: Pearson, 2015.

- **Communication and Course Material**

All supportive course material, assignments, and communication will be done through email and moodle. Make sure you regularly check your email/moodle accounts.

- **Grading Scheme**

Assessment	Percentage
Linux Lab	20%
Assignments	10%
Midterm Exam	30%
Final Exam	40%

- **Grade Assignment**

  Letter grades will be determined using a standard percentage point evaluation as outlined below

  A: 94-100   **A-:** 90-93   **B+:** 87-89   **B:** 84-86,   **B-:** 80-83

  C+: 77-79   **C:** 74-76   **C-:** 70-73   **D+:** 67-69   **D:** 64-66

  D-: 60-63   **F:** Below 60

Tentative Course Outline

Week	Topic	Notes
1	Introduction (Ch. 1)	
2	Cont. Introduction (Ch. 2)	
3	Linux Lab – Shell Programming	Lab component
4	Process Concept, scheduling, operations on processes, and interprocess communications (Programming fork – shared resources)	Lab component
5	Multithreading Programming Implicit programming, threading issues OS examples	Lab component
6	Lab – programming multithreading	Lab component
7	Process Scheduling Thread scheduling Multiple-process scheduling Real-time CPU scheduling	
8	OS examples	Lab component
9	Break	
10	Synchronization The critical section problem, Peterson's solution, synchronization HW, Mutex locks, semaphores, and some classic synchronization problems.	
11	Lab – examples to solve shared resources issues	Lab component
12	Deadlocks	
13	Memory-management strategies Swapping, contiguous memory allocation, segmentation, and paging	
14	Virtual-memory management Demand paging, copy-on-write, page replacement, allocation of frames, and thrashing	
15	Storage Management File system and its implementation (short intro.) Mass-storage Structure, and I/O system (short intro	

Course Policies and Strategies

Strategies for Success

- Ask questions in class for you are here to learn and part of learning is asking questions. I am of the philosophy that there is no silly question to ask. So please, please if you are in doubt or something is puzzling you then do ask me a question, to repeat what I said, to explain it in another way, to slow down, etc
- I strongly encourage you to take advantage of my office hours if you need any help with class work. I have my office hours posted on the syllabus, office door and on Moodle. If you want to see me but cannot make the office hours then either talk to me before or after class or email me so that we can schedule a time that suites both of us.
- Make use of the Student Success Center. They offer free tutoring for anyone who needs help in this class. The center usually has several people who can help for this class, so try working with each one and see who you prefer to work with and are more comfortable with.

Attendance

The American University of Kuwait recognizes that class attendance is an important element of students' classroom success. Students are expected to attend all classes, laboratories, and/or required fieldwork. Because excessive absences prevent students from receiving full course benefit, and disrupt orderly course progress, AUK has established the following policy on class attendance:

Any student who misses MORE THAN 15% of the class sessions of any course during a semester should expect to fail, unless s/he submits documented evidence to the course instructor of inpatient medical care, death of an immediate family member, academic instructional activities, or national athletic activities. If excused, students are required to satisfy all coursework due or assigned during their absences, as determined by the course instructor. If a student does not submit documented evidence for her/his absences exceeding the limit, it is the student's responsibility to withdraw from the course by the specified deadline, as indicated on the Academic Calendar. Students who withdraw from a course receive a grade of "W." Students who do not withdraw from a course nor submit supporting documents for excessive absences will receive a grade of "FN" (failure for non-attendance).

For more information on AUK's policies for attendance and missed classes please visit:

http://auk.edu.kw/about_auk/policy_procedure.jsp

Exams

Mention exam policies if any.

Makeup Exams

<u>**No makeup exams are allowed.**</u> If you miss an exam, due to health or family emergency you must provide an appropriate document (i.e. doctor's notice), and you should email me so alternative arrangements may be made.

Disability Accommodation

If you believe that you need accommodations for a disability, kindly arrange for an appointment with Dr. Huda Shaaban (hshaaban@auk.edu.kw) at the Counseling Center located in front of Gate 2 at the earliest with the understanding that all disability-related accommodations require registration with the Counseling Center and are not applied retroactively.

Mobile Phones

The use of mobile phones is strictly prohibited during class.

Plagiarism

The term "plagiarism" includes, but is not limited to, an attempt of an individual to claim the work of another as the product of his/her own thoughts, regardless of whether that work has been published. Plagiarism includes, but is not limited to, quoting improperly or paraphrasing text or other written materials without proper citation on an exam, term paper, homework, or other written material submitted to an Instructor as one's own work. Plagiarism also includes handing in a paper to an Instructor that was purchased from a term paper service or downloaded from the Internet and presenting another person's academic work as one's own.

Cheating

The term "cheating," includes but is not limited to, copying homework assignments from another student; working together with another individual on a take-home test or homework when specifically prohibited from doing so by the Instructor, looking at and/or copying text, notes or another person's paper during an examination when not permitted to do so. Cheating also includes the giving of work information to another student to be copied and/or used as his/her own. This includes but is not limited to giving someone answers to exam questions either when the exam is being given or after having taken an exam; informing another student of specific questions that appear or have appeared on an exam in the same academic semester; giving or selling a term paper, report, project or other restricted written materials to another student.

Dishonesty in Papers

Papers submitted in courses must be the original work of the student with appropriate citations and references. Papers or other reports prepared by another person or purchased from another person or company and submitted as one's own work is a violation of academic honesty.

Dishonesty in Exams

This includes the use of unauthorized materials, receipt of information and/or answers from others during the examination, or the transferal of unauthorized materials, information or answers to another student.

Work for One Course Submitted for Another

Work submitted for one course may not be submitted for another. It is a violation of academic integrity to submit the same work in more than one course. The incorporation by students of past writing or research into current projects must be clearly indicated.

Adjudication of Academic Dishonesty and Integrity

The University reserves the right of imposing on the violators of academic honesty disciplinary action ranging from a failing grade in the exam, paper or course to suspension or dismissal from the University. For more information refer to the "Academic Dishonesty" policy in the University Undergraduate Catalog, refer to the following link:

http://www.auk.edu.kw/about_auk/Student_Code_of_Conduct11OCT10.pdf