San José State University
Department of Computer Science
CS 149 – Operating Systems, Section 2, Spring 2017

Course and Contact Information

Instructor:	Ahmed Ezzat
Office Location:	**Duncin Hall**, Room 282
Email:	Ahmed.Ezzat@sjsu.edu
Office Hours:	Tu 6:15PM – 7:15PM (by reservation)
Class Hours:	Tu,Th: 7:30PM – 8:45PM
Classroom:	**Sweeney Hall-100**
Prerequisites:	CS 146 (Data Structures and Algorithms) *or SE-146* with a grade of C- or better, or instructor's consent. The Department of Computer Science strictly enforces prerequisites. The instructor may drop any student who does not show up for the first two class meetings without providing a valid excuse ahead of time.
Grader: Sahil Kaw	**Email:** sahil.kaw@sjsu.edu

Course Description

Operating Systems: Fundamentals: Contiguous and non-contiguous memory management; processor scheduling and interrupts; concurrent, mutually exclusive, synchronized and deadlocked processes; files. Substantial programming project required **Prerequisite:** CS 146 or SE 146 (with a grade of "C-" or better). Computer Science, Applied and Computational Math or Software Engineering Majors only; or Instructor Consent

Course Learning Outcomes (CLO)

Upon successful course completion, students would achieve the following:

- Understand the role that the operating system software plays in the management of the various hardware subsystems of the computer system
- Understand locality of memory reference and how it is used to perform effective memory hierarchy management
- Understand the various mapping, replacement, and dynamic allocation algorithms for cache and virtual memory management
- Understand the alternative CPU scheduling schemes, their tradeoffs, and their applications to other queue processing situations
- Appreciate the difficult tradeoffs faced when attempting to deal with the resource deadlock problem and distinguish between the different deadlock prevention and avoidance schemes and understand why and how deadlocks can still happen today

- Understand software race conditions, their origin and the problems they can cause, along with knowing how to apply semaphores in software design to solve the race condition problem
- Understand the various issues associated with the operating system's role in performing I/O and file management.

Required Texts/Readings

- **Modern Operating Systems** *by Andrew Tanenbaum and Herbert BOS, 4th Edition, Pearson Prentice Hall (2015).* ***ISBN-13:*** *978-0-13-359162-0 or* ***ISBN-10:*** *978-0-13-359162-x* [Mandatory].

Course Requirements and Assignments

All the assignments and related documents must be handed in the classroom on due date. Students will lose 10% of the homework or project grade for each day delay, and after 5 days, homework or projects will not be accepted.

Homework and Project descriptions are available on Canvas

- Homework-1: Assignment is on Feb. 2, 2017, and is due back on Feb. 16, 2017.
- Homework-2: Assignment is on Feb. 16, 2017, and is due back on March 2, 2017.
- Homework-3: Assignment is on March 2, 2017, and is due back on March 21, 2017.
- Homework-4: Assignment is on March 21, 2017, and is due back on April 6, 2017.
- Homework-5: Assignment is on April 6, 2017, and is due back on April 25, 2017.
- Homework-6: Assignment is on April 25, 2017, and is due back on May 9, 2017.

Exams or Evaluation

The midterm and final examinations will be closed book and no notes. There will be no laptops, or any personal digital devices allowed. There will be no make-up exams. If a student misses an exam without a legitimate excuse, a grade of zero will be recorded. If a student missed an exam with a legitimate excuse then the grade for that exam will be prorated. More details can be found on final examination in *University Policy S06-4 (http://www.sjsu.edu/senate/docs/S06-4.pdf) which states that "There shall be an appropriate final examination or evaluation at the scheduled time in every course, unless specifically exempted by the college dean who has curricular responsibility for the course."*

Grading Information

Your individual class grade will be weighted as follows:

- Assignments 40% 40 points group scores

- Class Quizzes 10% 10 points individual score
- Midterm 25% 25 points individual scores
- Final exam 25% 25 points individual scores

Each assignment, project, and exam will be scored (given points) but not assigned a letter grade. The mean score will be announced after each exam.

Important NOTE:

In some occasions, the instructor may decide to administer evaluations where students are allowed to use their "paper notes"- (NO BOOK OR ELECTRONIC COPIES), so it is in your best interest to attend to class and take good notes; they may be handy in such situations. These class quizzes amount to 10% of the class grade.

Determination of Grades

Final individual class letter grades will be assigned based on the class curve (i.e. relative grading). Your final class grade can be adjusted up or down depending on your level and quality of participation on your project team.

Classroom Protocol

It is expected that student attend classes, be active and participate in the class by asking/answering questions, arrive in time and leave only after the class is ended. No eating is allowed in the classroom, and it is expected to turn your cell off before entering the classroom.

University Policies

General Expectations, Rights and Responsibilities of the Student

Per University Policy S16-9, university-wide policy information relevant to all courses, such as academic integrity, accommodations, etc. will be available on Office of Graduate and Undergraduate Programs' Syllabus Information web page at http://www.sjsu.edu/gup/syllabusinfo/

CS 149, Operating Systems, Section 1, Course Schedule

Any changes in the schedule will be sent to registered students through SJSU email 1 week earlier.

Tentative Course Calendar

Week	Date	Item
1	Jan. 26th	Lecture: Operating Systems Overview (Ch. 1)
2	Jan. 31st	Lecture: Operating Systems Overview (Ch. 1)
2	Feb. 2nd	Lecture: Processes and Threads (Ch. 2) + **HW-1 Preview**
3	Feb. 7th	Lecture: Processes and Threads (Ch. 2)
3	Feb. 9th	Lecture: Processes and Threads (Ch. 2)
4	Feb. 14th	Lecture: Memory Management (Ch. 3)
4	Feb. 16th	Lecture: Memory Management (Ch. 3) + **HW-2 Preview** + **Return HW1**
5	Feb. 21st	Lecture: File Systems (Ch. 4)
5	Feb. 23rd	Lecture: File Systems (Ch. 4)
6	Feb. 28th	Lecture: Input/Output (Ch. 5)
6	March 2nd	Lecture: Input/Output (Ch. 5) + **HW-3 Preview** + **Return HW-2**
7	March 7th	Lecture: Deadlock (Ch. 6)
7	March 9th	Lecture: Deadlock (Ch. 6) + Virtualization and the Cloud (Ch. 7) + **Midterm Review**
8	March 14th	Lecture: Virtualization and the Cloud (Ch. 7)
8	March 16th	**Midterm (Closed book)**
9	March 21st	Lecture: Multiple Processor Systems (Ch. 8) **HW-4 Preview** + **Return HW-3**
9	March 23rd	Lecture: Multiple Processor Systems (Ch. 8)
10	March 28th	**Spring Recess**
10	March 30th	**Spring Recess**
11	April 4th	Lecture: Multiple Processor Systems (Ch. 8)
11	April 6th	Lecture: Network Architecture and Network Protocols + **HW-5 Preview** + **Return HW-4**
12	April 11th	Lecture: Network Architecture and Network Protocols
12	April 13th	Lecture: Security (Ch. 9)
13	April 18th	Lecture: Security (Ch. 9)
13	April 20th	Lecture: Case Study 1: Unix, Linux and Android (Ch. 10)
14	April 25th	Lecture: Case Study 1: Unix, Linux and Android (Ch. 10) + **HW-6 Preview** + **Return HW-5**
14	April 27th	Lecture: Case Study 1: Unix, Linux and Android (Ch. 10)
15	May 2nd	Lecture: Case Study 2: Windows 8 (Ch. 11)
15	May 4th	Lecture: Case Study 2: Windows 8 (Ch. 11)
16	May 9th	Lecture: Case Study 2: Windows 8 (Ch. 11) + **Return HW-6**
16	May 11th	Lecture: Case Study 3: Mac OS X+ **Final Review**
17	May 16th	Lecture: Operating Systems Design (Ch. 12)
17	May 18th	**Final (Closed book) – Sweeney Hall-100, Time: 7:45pm – 9:15pm**