San José State University
Department of Computer Science
CS 149 – Operating Systems, Section 1, Fall 2016

Course and Contact Information

Instructor:	Ahmed Ezzat
Office Location:	Duncin Hall, Room 282
Email:	Ahmed.Ezzat@sjsu.edu
Office Hours:	Tu 5:00PM – 6:00PM (by reservation)
Class Hours:	Tu,Th: 6:00PM – 7:15PM
Classroom:	**Duncan Hall-250**
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: Vansh Shah   **Email: vanshshashikant.shah@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.

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 Sept 6, 2016, and is due back on Sept 15, 2016.
- Homework-2: Assignment is on Sept 20, 2016, and is due back on Sept 29, 2016.
- Homework-3: Assignment is on Oct 4, 2016, and is due back on Oct 18, 2016.
- Homework-4: Assignment is on Oct 20, 2016, and is due back on Nov 1, 2016.
- Homework-5: Assignment is on Nov 3, 2016, and is due back on Nov 15, 2016.
- Homework-6: Assignment is on Nov 17, 2016, and is due back on Nov 29, 2016.

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   50%   50 points   group scores
- 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.

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.

Week	date	Item
1	Aug 25th	Lecture: Operating Systems Overview (Ch. 1)
2	Aug 30th	Lecture: Operating Systems Overview (Ch. 1)
2	Sept 1st	Lecture: Processes and Threads (Ch. 2) + HW-1 Preview
3	Sept 6th	Lecture: Processes and Threads (Ch. 2)
3	Sept 8th	Lecture: Processes and Threads (Ch. 2)
4	**Sept 13th**	Lecture: Memory Management (Ch. 3)
4	**Sept 15th**	Lecture: Memory Management (Ch. 3) + HW-2 Preview
5	**Sept 20th**	Lecture: File Systems (Ch. 4)
5	Sept 22nd	Lecture: File Systems (Ch. 4)
6	Sept 27th	Lecture: Input/Output (Ch. 5)
6	Sept 29th	Lecture: Input/Output (Ch. 5) + HW-3 Preview
7	Oct 4th	Lecture: Deadlock (Ch. 6)
7	Oct 6th	Lecture: Deadlock + Virtualization and the Cloud (Ch. 7) + Midterm Review
8	**Oct 11th**	Lecture: Virtualization and the Cloud (Ch. 7)
8	**Oct 13th**	**Midterm (Closed book)**
9	**Oct 18th**	Lecture: Multiple Processor Systems (Ch. 8) + HW-4 Preview
9	**Oct 20th**	Lecture: Multiple Processor Systems (Ch. 8)
10	**Oct 25th**	Lecture: Multiple Processor Systems (Ch. 8)
10	**Oct 27th**	Lecture: Network Architecture and Network Protocols
11	**Nov 1st**	Lecture: Network Architecture and Network Protocols + HW-5

		Preview
11	Nov 3rd	Lecture: Security (Ch. 9)
12	Nov 8th	Lecture: Security (Ch. 9)
12	Nov 10th	Lecture: Case Study 1: Unix, Linux and Android (Ch. 10)
13	Nov 15th	Lecture: Case Study 1: Unix, Linux and Android (Ch. 10) + HW-6 Preview
13	Nov 17th	Lecture: Case Study 1: Unix, Linux and Android (Ch. 10)
14	Nov 22nd	**Thanksgiving**
14	Nov 24th	Lecture: Case Study 2: Windows 8 (Ch. 11)
15	Nov 29th	Lecture: Case Study 2: Windows 8 (Ch. 11)
15	Dec 1st	Lecture: Case Study 3: Mac OS
16	Dec 6th	Lecture: Operating Systems Design (Ch. 12) + Final Review
16	Dec 8th	Class review
17	Dec 15th	**Final (Closed book) – DH-250, Time: 17:15 – 19:00**