

San José State University
Aerospace Engineering
AE 200, Engineering Analysis and Control of Aerospace Systems, Section 02,
Fall, 2020

Course and Contact Information

Instructor(s):	Dr. Lucía Capdevila
Office Location:	Engineering Building 272 E
Telephone:	(408) 924 – 3126
Email:	lucia.capdevila@sjsu.edu
Office Hours:	Tuesdays and Thursdays 15:00 – 16:00
Class Days/Time:	Tuesdays and Thursdays 16:30 – 17:45
Classroom:	Canvas course website
Prerequisites:	BSAE or Instructor Consent

Course Description

Engineering analysis and control; linear algebra; ordinary differential equations; Laplace transformation; complex analysis; singular values; matrix perturbations; state-space models; input/output and robust stability; reachability and observability; feedback stabilization; H₂ and H-infinity optimization.

Course Format

Technology Intensive, Hybrid, and Online Courses

This course adopts an online delivery format with synchronous online meetings. The course will also be taught in a flipped classroom format where students will be expected to complete readings before attending class meetings. Students will require internet connectivity and access to a computer to participate in classroom activities and submit assignments.

Faculty Web Page and MYSJSU Messaging

Course materials such as syllabus, handouts, notes, assignment instructions, etc. can be found on [Canvas Learning Management System course login website](#) at <http://sjsu.instructure.com>. You are responsible for regularly checking with the messaging system through [Canvas](#) to learn of any updates. For help with using Canvas see [Canvas Student Resources page \(http://www.sjsu.edu/ecampus/teaching-tools/canvas/student_resources\)](http://www.sjsu.edu/ecampus/teaching-tools/canvas/student_resources) If I cannot reach you via Canvas messaging, I will email you at the address provided in [MySJSU](#).

Course Goals

1. Solve linear algebra problems
2. Solve Ordinary Differential Equations (ODEs)

3. Solve Partial Differential Equations (PDEs)

Course Learning Outcomes (CLO)

Upon successful completion of this course, students will be able to:

1. Solve systems of linear equations
2. Solve eigenvector/eigenvalue problems
3. Solve homogeneous linear ODEs
4. Solve nonhomogeneous linear ODEs
5. Solve linear system of ODEs
6. Approximate functions using Fourier series
7. Solve PDEs using separation of variables

Required Texts/Readings

Textbook

[Kreyszig, Norminton, Kreyszig, Herbert, & Norminton, E. J. \(2011\). Advanced engineering mathematics \(10th ed.\). Hoboken, New Jersey: Wiley.](#)

Other Readings

Notes and handouts.

Course Requirements and Assignments

Success in this course is based on the expectation that students will spend, for each unit of credit, a minimum of 45 hours over the length of the course (normally three hours per unit per week) for instruction, preparation/studying, or course related activities, including but not limited to internships, labs, and clinical practica. Other course structures will have equivalent workload expectations as described in the syllabus.

Students are expected to attend class prepared by having completed pre-lecture activities including readings that will be posted on our Canvas course website. During class, students may take a quiz over the assigned reading, we will go over important and/or difficult points and work on problems for credit. Students will be assigned homework problems on a weekly or bi-weekly basis. Mid-term exams will take place during class meetings.

Final Examination or Evaluation

A comprehensive final exam will be given during our class' final exam slot.

Grading Information

Determination of Grades

- Grade Scale:
 - 100 to 97% A plus
 - less than 97% and above or equal to 93% A
 - less than 93% and above or equal to 90% A minus
 - less than 90% and above or equal to 87% B plus
 - less than 87% and above or equal to 83% B
 - less than 83% and above or equal to 80% B minus
 - less than 80% and above or equal to 77% C plus

- less than 77% and above or equal to 73% C
 - less than 73% and above or equal to 70% C minus
 - less than 70% and above or equal to 67% D plus
 - less than 67% and above or equal to 63% D
 - less than 63% and above or equal to 60% D minus
 - less than 60% F
- Grade Components Weight:
 - Class participation (Quizzes and/or In-Class Activities): 10 %
 - Homework assignments: 30 %
 - Exams: 60 %
 - Students may calculate their current grade in the class by following the “grade scale” and “grade components weight” described above.
 1. Add all the points earned in a given category, divide by the total points possible, and multiply by the component weight.
 2. Repeat step 1 for all grade components.
 3. Add all grade components together.
 4. Determine grade by referring to “grade scale”.

Example:

Suppose a student has completed 5 assignments so far and earned the grades listed next to the assignment names: Quiz 1: 10/10, In-Class Activity 1: 5/5, Homework 1: 85/100, Homework 2: 95/100, Exam 1: 90/100. Then, applying grade component weights above, the *current grade* calculation is as follows: $(10\%)(10 + 5)/(10 + 5) + (30\%)(85 + 95)/(100 + 100) + (60\%)(90)/(100) = 91\%$

Then, by comparing the resulting percentage to the grade scale above, the student’s *current grade* corresponds to an A minus.

- All exams must be taken to receive a passing grade.
- All assignments will be submitted via [Canvas](http://sjsu.instructure.com) at <http://sjsu.instructure.com> by the due date posted on Canvas.
- Late work is not accepted for credit without a valid justification and proper documentation.
- Extra credit opportunities will be announced during class.

Classroom Protocol

It is expected that everyone will treat each other and themselves with the highest respect at all times. We all benefit from each other’s contributions to the class, so everyone’s timely attendance and participation are also expected.

University Policies

Each student is responsible for understanding the following information and let me know if you have any questions:

- [Academic Integrity Policy F15-7](https://www.sjsu.edu/senate/docs/F15-7.pdf) at <https://www.sjsu.edu/senate/docs/F15-7.pdf>
- [Student Conduct and Ethical Development](https://www.sjsu.edu/studentconduct/) at <https://www.sjsu.edu/studentconduct/>
- [AE Program Policies](http://www.sjsu.edu/ae/programs/policies/) at <http://www.sjsu.edu/ae/programs/policies/>
- Accessibility: If you need course adaptations or accommodations because of a disability, or if you need special arrangements in case the building must be evacuated, please make an appointment with me as

soon as possible, or see me during office hours. Presidential Directive 97-03 requires that students with disabilities requesting accommodations must register with [AEC](#) to establish a record of their disability.

AE 200 / Engineering Analysis and Control of Aerospace Systems, Fall 2020, Course Schedule

The following is an *approximate* course schedule that is subject to change with fair notice given during class and/or via email and/or Canvas messaging.

Course Schedule

Week	Date	Topics
1	Thursday, August 20, 2020	Introduction and orientation
2	Tuesday, August 25, 2020	Linear Algebra - part 1
2	Thursday, August 27, 2020	Linear Algebra - part 2
3	Tuesday, September 1, 2020	Linear Algebra - part 3
3	Thursday, September 3, 2020	Linear Algebra - part 4
4	Tuesday, September 8, 2020	Linear Algebra - part 5
4	Thursday, September 10, 2020	Linear Algebra - part 6
5	Tuesday, September 15, 2020	2nd Order ODEs - part 1
5	Thursday, September 17, 2020	2nd Order ODEs - part 2
6	Tuesday, September 22, 2020	2nd Order ODEs - part 3
6	Thursday, September 24, 2020	2nd Order ODEs - part 4
7	Tuesday, September 29, 2020	Exam 1 - Linear Algebra
7	Thursday, October 1, 2020	2nd Order ODEs - part 5
8	Tuesday, October 6, 2020	2nd Order ODEs - part 6
8	Thursday, October 8, 2020	2nd Order ODEs - part 7
9	Tuesday, October 13, 2020	2nd Order ODEs - part 8
9	Thursday, October 15, 2020	Fourier - part 1
10	Tuesday, October 20, 2020	Fourier - part 2
10	Thursday, October 22, 2020	Fourier - part 3
11	Tuesday, October 27, 2020	PDEs - part 1
11	Thursday, October 29, 2020	PDEs - part 2
12	Tuesday, November 3, 2020	Exam 2 - ODEs
12	Thursday, November 5, 2020	PDEs - part 3
13	Tuesday, November 10, 2020	PDEs - part 4

Week	Date	Topics
13	Thursday, November 12, 2020	PDEs - part 5
14	Tuesday, November 17, 2020	Optional topics – part 1
14	Thursday, November 19, 2020	Optional topics – part 2
15	Tuesday, November 24, 2020	Optional topics – part 3
15	Thursday, November 26, 2020	Thanksgiving Holiday - Campus Closed
16	Tuesday, December 1, 2020	Exam 3 - Fourier/PDEs
16	Thursday, December 3, 2020	Review Q/A
Final Exam	Thursday, December 10, 2020 14:45-17:00	Final Exam