

**EE110 Circuits and Systems**  
**Fall 2018, Section 1**

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<b>Office Hours:</b>	Make an appointment <a href="#">here</a> .
<b>Class Days/Time:</b>	MW 3-4:45pm
<b>Classroom:</b>	ENGR 345
<b>Prerequisites:</b>	EE 098 and MATH 133A (with grade of "C" or better) and passing the EE101 placement exam with an 80% or better.

**Course Description:**

Continuous-time signals, circuits and systems. Impulse response and convolution. Laplace and Fourier transforms. Frequency response, transfer function, poles/zeros, filtering. Application to passive and active circuits, and to basic control, communications, and bio systems.

**Course Learning Objectives:**

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

- LO1: analyze continuous-time signals and LTI systems in the time domain using convolution
- LO2: describe LTI systems behavior in terms of the frequency response and Bode plots
- LO3: analyze passive and active filter circuits.
- LO4: utilize the Laplace transform to analyze LTI system functions, poles and zeros, and relation to the impulse and frequency responses
- LO5: utilize the Laplace transform to calculate the transient and steady-state response of LTI circuits and systems.
- LO6: utilize Fourier analysis to characterize the frequency contents of signals and to determine the response of LTI circuits and systems to periodic and aperiodic signals.
- LO7: analyze analysis of simple control, communications, and bio systems

The following table shows the level of this course's contribution to the achievement of EE program outcomes and meeting the ABET program requirements. Bloom's Taxonomy is used in the definition of learning level: 0-Not Applicable, 1-knowledge, 2-Comprehension, 3-Application, 4-Analysis, 5-Synthesis, 6-Evaluation.

ABET Student outcomes:

1. an ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics **5**
2. an ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors **0**
3. an ability to communicate effectively with a range of audiences **0**
4. an ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts **0**
5. an ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives **0**
6. an ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions **0**
7. an ability to acquire and apply new knowledge as needed, using appropriate learning strategies. **0**

## Required Texts/Readings

### Textbook

F. Ulaby and A. Yagle, *Engineering Signals and Systems*, NTS Press, 2012. Available at the bookstore or can be purchased directly from the publisher. See <http://www.ntspress.com/publications/engineering-signals-and-systems/>

## Exams and Assignments

There will be two midterms and one final exam.

Homework is crucial for understanding the course material. Homework will be assigned regularly and will be collected and graded. Some homework problems require computer software such as python and LTspice. These programs are available on Electrical Engineering computer lab, EE110L labs and are free to download on your PC. You're encouraged to discuss homework problems with other students in the class but you have to submit your own independent solutions, with your groups members' names listed. Copied homework earns zero grade for all parties involved and could have more serious consequences. All in-class quizzes are open-book and some collaborative.

SJSU classes are designed such that in order to be successful, it is expected that students will spend a minimum of forty-five hours for each unit of credit (normally three hours per unit per week), including preparing for class, participating in course activities, completing assignments, and so on. More details about student workload can be found in [University Policy S12-3](http://www.sjsu.edu/senate/docs/S12-3.pdf) at <http://www.sjsu.edu/senate/docs/S12-3.pdf>.

## Grading Policy

Homework/Other	15%
Midterm Exam #1:	25%
Midterm Exam #2:	25%
Final Exam	: 35%

Late HW: 20% per day, after solution is posted.

- 94% and above      A
- 93% - 90%          A-
- 89% - 87%          B+
- 86% - 84%          B
- 83% - 80%          B-
- 79% - 77%          C+
- 76% - 74%          C
- 73% - 70%          C-
- 69% - 67%          D+
- 66% - 64%          D
- 63% - 60%          D-

## Dropping and Adding

Students are responsible for understanding the policies and procedures about add/drop, grade forgiveness, etc. Refer to the current semester's [Catalog Policies](http://info.sjsu.edu/static/catalog/policies.html) section at <http://info.sjsu.edu/static/catalog/policies.html>. Add/drop deadlines can be found on the current academic year calendars document on the [Academic Calendars webpage](http://www.sjsu.edu/provost/services/academic_calendars/) at [http://www.sjsu.edu/provost/services/academic\\_calendars/](http://www.sjsu.edu/provost/services/academic_calendars/). The [Late Drop Policy](http://www.sjsu.edu/aars/policies/latedrops/policy/) is available at <http://www.sjsu.edu/aars/policies/latedrops/policy/>. Students should be aware of the current deadlines and penalties for dropping classes.

Information about the latest changes and news is available at the [Advising Hub](http://www.sjsu.edu/advising/) at <http://www.sjsu.edu/advising/>.

### Consent for Recording of Class and Public Sharing of Instructor Material

[University Policy S12-7](http://www.sjsu.edu/senate/docs/S12-7.pdf), <http://www.sjsu.edu/senate/docs/S12-7.pdf>, requires students to obtain instructor's permission to record the course and the following items to be included in the syllabus:

- “Common courtesy and professional behavior dictate that you notify someone when you are recording him/her. You must obtain the instructor's permission to make audio or video recordings in this class. Such permission allows the recordings to be used for your private, study purposes only. The recordings are the intellectual property of the instructor; you have not been given any rights to reproduce or distribute the material.”
- “Course material developed by the instructor is the intellectual property of the instructor and cannot be shared publicly without his/her approval. You may not publicly share or upload instructor generated material for this course such as exam questions, lecture notes, or homework solutions without instructor consent.”

### Academic integrity

Your commitment, as a student, to learning is evidenced by your enrollment at San Jose State University. The [University Academic Integrity Policy S07-2](http://www.sjsu.edu/senate/docs/S07-2.pdf) at <http://www.sjsu.edu/senate/docs/S07-2.pdf> requires you to be honest in all your academic course work. Faculty members are required to report all infractions to the office of Student Conduct and Ethical Development. The [Student Conduct and Ethical Development website](http://www.sjsu.edu/studentconduct/) is available at <http://www.sjsu.edu/studentconduct/>.

### Campus Policy in Compliance with the American Disabilities Act

If you need course adaptations or accommodations because of a disability, or if you need to make 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](http://www.sjsu.edu/president/docs/directives/PD_1997-03.pdf) at [http://www.sjsu.edu/president/docs/directives/PD\\_1997-03.pdf](http://www.sjsu.edu/president/docs/directives/PD_1997-03.pdf) requires that students with disabilities requesting accommodations must register with the [Accessible Education Center](http://www.sjsu.edu/aec) (AEC) at <http://www.sjsu.edu/aec> to establish a record of their disability.

### Accommodation to Students' Religious Holidays

San José State University shall provide accommodation on any graded class work or activities for students wishing to observe religious holidays when such observances require students to be absent from class. It is the responsibility of the student to inform the instructor, in writing, about such holidays before the add deadline at the start of each semester. If such holidays occur before the add deadline, the student must notify the instructor, in writing, at least three days before the date that he/she will be absent. It is the responsibility of the instructor to make every reasonable effort to honor the student request without penalty, and of the student to make up the work missed. See [University Policy S14-7](http://www.sjsu.edu/senate/docs/S14-7.pdf) at <http://www.sjsu.edu/senate/docs/S14-7.pdf>.

## Tentative Course Schedule

Class number	Date	Topics	Readings
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1	8/22/2018	<b>Module 1: Class organization, Signal types transformations and properties</b>	<b>1-1,1-2,1-3</b>
2	8/27/2018	Module 2: Non-periodic signals	1-4
3	8/29/2018	Module 3: LTI Systems. Impulse response	2-1, 2-2
4	9/3/2018	Labor Day	
5	9/5/2018	Module 4: Convolution. Analytical & graphical evaluation	2-3, 2-4
6	9/10/2018	Module 5: Laplace Transform	3-1, 3-4
7	9/12/2018	Module 6: Frequency Domain Convolution and Bode Plots	Notes
8	9/17/2018	Module 7: Bode Plots and Frequency Response related to time response	4-1, 4-2
9	9/19/2018	Module 8: Introduction to filtering	6-1: 6-4
10	9/24/2018	Module 9: Active filters	6-4
11	9/26/2018	Module 10: Review	
12	10/1/2018	Module 11: MT #1	
13	10/3/2018	Module 12: Review OPAMP Circuits, Multiple systems	4-5, 4-6
14	10/8/2018	Module 13: System Synthesis	4-7
15	10/10/2018	Module 14: DFI, DFIL,    synthesis case study	4-7
16	10/15/2018	Module 15: OPAMP GBW	4-9
17	10/17/2018	Module 16: Fourier Series Analysis Technique	5-2

	10/22/2018	Module 17: Fourier Series Representation and Coefficient Calculation	5-3, 5-4
	10/24/2018	Module 18: Fourier Continued	4-8
<b>18</b>	10/29/2018	Module 19: Basic Control Theory	4-8, 4-11
<b>19</b>	10/31/2018	Module 20: Control Theory	
<b>20</b>	11/5/2018	Module 21: Stabilization, Inversion, GBW	
<b>21</b>	11/7/2018	Module 22: Review	Notes
<b>22</b>	11/12/2018	Veteran's Day	
<b>23</b>	11/14/2018	Module 23: MT #2	Notes
<b>24</b>	11/19/2018	Module 24: LDO as a control system	Notes
<b>25</b>	11/21/2018	Thanksgiving	
<b>26</b>	11/26/2018	Module 25: System ID, s-domain	6-5: 6-9
<b>27</b>	11/28/2018	Module 26: System ID, transient	
<b>28</b>	12/3/2018	Module 27: Fourier analysis for advanced filters	
<b>29</b>	12/5/2018	Module 28: Modulation 1	
<b>30</b>	12/10/2018	Module 29: Modulation 2/Review	
<b>31</b>	Final Exam	Friday, December 14	1215-1430 in Room 345