Course Information

Course Number:	ECEN 325
Course Title:	Electronics
Section:	513, 514, 515, 516, 517, 518
Time:	Lecture: TR 8:00am – 9:15am
	Lab section 513: F 8:00am – 10:50am
	Lab section 514: F 11:30am – 2:20pm
	Lab section 515: F 3:00pm – 5:50pm
	Lab section 516: F 6:00pm – 8:50pm
	Lab section 517: M 8:00am – 10:50am
	Lab section 518: M 11:30am – 2:20pm
Location:	Lecture: Online (Zoom)
	Lab: ZACH 333
Credit Hours:	4

Instructor Details

Instructor:	Dr. Aydin I. Karsilayan
Office:	WEB 318-C
Phone:	(979) 458-3555
E-Mail:	karsilay@tamu.edu
Office Hours:	TR 9:30am – 11:00am, and by appointment. Webcam is required for Zoom.

Course Description

Introduction to electronic systems; linear circuits; operational amplifiers and applications; diodes, field effect transistors, bipolar transistors; amplifiers and nonlinear circuits.

Course Prerequisites

Grade of C or better in MATH 311; grade of C or better in ECEN 314, or concurrent enrollment.

Course Learning Outcomes

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

- *Analyze linear networks and draw Bode plots*
- *Analyze and design linear operational amplifier circuits*
- *Design operational amplifier circuits with finite gain-bandwidth product and slew-rate*
- *Solve nonlinear diode circuits and apply linearization techniques*
- *Design diode-based rectifiers*
- *Solve large-signal and small-signal operation of BJT and MOSFET amplifiers*
- *Analyze and design multi-stage amplifiers based on BJTs and MOSFETs*
- *Use a circuit simulator and electrical measurement devices.*

Textbook and/or Resource Materials

Recommended Textbook: *Microelectronic Circuits, 7th Edition, A. Sedra and K. Smith, Oxford University Press, 2015. Microelectronic Circuits, 8th Edition, Adel S. Sedra, Kenneth C. Smith, Tony Chan Carusone, Vincent Gaudet, Oxford University Press, November 15, 2019..*
Analog Discovery 2: *http://www.ni.com/en-us/shop/select/analog-discovery-2*
Waveforms: *https://reference.digilentinc.com/reference/software/waveforms/waveforms-3/start*
MultiSim: *https://software.tamu.edu*
MultiSim Online: *https://connect.voal.tamu.edu*
Course material will be available on https://canvas.tamu.edu
Use of NI MultiSim is ***required*** *throughout the course.*

Grading Policy

Webcam is required and video must be turned on during all quizzes and exams.

Quiz 1: 10%	*January 28*	*8:45am-9:15am*
Quiz 2: 10%	*February 11*	*8:45am-9:15am*
Quiz 3: 10%	*February 25*	*8:45am-9:15am*
Quiz 4: 10%	*March 16*	*8:45am-9:15am*
Quiz 5: 10%	*April 1*	*8:45am-9:15am*
Quiz 6: 10%	*April 13*	*8:45am-9:15am*
Quiz 7: 10%	*April 22*	*8:45am-9:15am*
Final: 15%	*May 5*	*5:00pm-7:30pm*
Labs: 15%		

Grading Scale: ***A****: 100-90* ***B****: 89-80* ***C****: 79-70* ***D****: 69-60* ***F****: <60*
Curve-based grading may be applied to provide ***higher*** *grades.*

Late Work Policy

Unexcused late work (submission of a deliverable after the established deadline) will not be accepted. Work submitted as makeup work for an excused absence is not considered late work and is exempted from the late work policy. (See Student Rule 7.)

Course Schedule

Week	***Topic***
1-2	*Linear Network Analysis*
3-4	*Operational Amplifiers*
5	*Diodes, rectifiers, small-signal analysis*
6	*BJT DC operation*
7-8	*Analysis of BJT amplifiers*
9-10	*Design of BJT amplifiers*
11	*MOSFET DC operation*
12-13	*Analysis of MOSFET amplifiers*
14	*Design of MOSFET amplifiers*

Experiment	***Measurements & Report Due***
Lab 1 *– First Order Circuits*	*Feb 1-5*
Lab 2 *– Second Order Circuits*	*Feb 8-12*
Lab 3 *– Operational Amplifiers - Part I*	*Feb 15-19*
Lab 4 *– Operational Amplifiers - Part II*	*Feb 22-26*
Lab 5 *– Operational Amplifiers - Part III*	*March 1-5*
Lab 6 *– Diodes*	*March 8-12*
Lab 7 *– Characterization and DC Biasing of the BJT*	*March 15-18*
Lab 8 *– BJT Amplifier Configurations*	*March 22-26*
Lab 9 *– BJT Amplifier Design*	*April 5-9*
Lab 10 *– Characterization of the MOSFET*	*April 12-16*
Lab 11 *– MOSFET Amplifier Configurations*	*April 19-23*
Lab 12 *– MOSFET Amplifier Design*	*April 26-30*

Labs consist of multiple sections: Calculations, simulations and measurements, where all sections are required for a nonzero grade. Calculations and simulations must be completed before the measurements section. Measurements can be performed using one of the following options: Virtual equipment in MultiSim, Analog Discovery II, or benchtop equipment in Zachry 333.

University Policies

Attendance Policy

The university views class attendance and participation as an individual student responsibility. Students are expected to attend class and to complete all assignments.

Please refer to Student Rule 7 in its entirety for information about excused absences, including definitions, and related documentation and timelines.

Makeup Work Policy

Students will be excused from attending class on the day of a graded activity or when attendance contributes to a student's grade, for the reasons stated in Student Rule 7, or other reason deemed appropriate by the instructor.

Please refer to Student Rule 7 in its entirety for information about makeup work, including definitions, and related documentation and timelines.

Absences related to Title IX of the Education Amendments of 1972 may necessitate a period of more than 30 days for make-up work, and the timeframe for make-up work should be agreed upon by the student and instructor" (Student Rule 7, Section 7.4.1).

"The instructor is under no obligation to provide an opportunity for the student to make up work missed because of an unexcused absence" (Student Rule 7, Section 7.4.2).

Students who request an excused absence are expected to uphold the Aggie Honor Code and Student Conduct Code. (See Student Rule 24.)

Academic Integrity Statement and Policy

"An Aggie does not lie, cheat or steal, or tolerate those who do."

"Texas A&M University students are responsible for authenticating all work submitted to an instructor. If asked, students must be able to produce proof that the item submitted is indeed the work of that student. Students must keep appropriate records at all times. The inability to authenticate one's work, should the instructor request it, may be sufficient grounds to initiate an academic misconduct case" (Section 20.1.2.3, Student Rule 20).

You can learn more about the Aggie Honor System Office Rules and Procedures, academic integrity, and your rights and responsibilities at aggiehonor.tamu.edu.

Americans with Disabilities Act (ADA) Policy

Texas A&M University is committed to providing equitable access to learning opportunities for all students. If you experience barriers to your education due to a disability or think you may have a disability, please contact Disability Resources in the Student Services Building or at (979) 845-1637 or visit disability.tamu.edu. Disabilities may include, but are not limited to attentional, learning, mental health, sensory, physical, or chronic health conditions. All students are encouraged to discuss their disability related needs with Disability Resources and their instructors as soon as possible.

Title IX and Statement on Limits to Confidentiality

Texas A&M University is committed to fostering a learning environment that is safe and productive for all. University policies and federal and state laws prohibit gender-based discrimination and sexual harassment, including sexual assault, sexual exploitation, domestic violence, dating violence, and stalking.

With the exception of some medical and mental health providers, all university employees (including full and part-time faculty, staff, paid graduate assistants, student workers, etc.) are Mandatory Reporters and must report to the Title IX Office if the employee experiences, observes, or becomes aware of an incident that meets the following conditions (see University Rule 08.01.01.M1):

- The incident is reasonably believed to be discrimination or harassment.
- The incident is alleged to have been committed by or against a person who, at the time of the incident, was (1) a student enrolled at the University or (2) an employee of the University.

Mandatory Reporters must file a report regardless of how the information comes to their attention – including but not limited to face-to-face conversations, a written class assignment or paper, class discussion, email, text, or social media post. Although Mandatory Reporters must file a report, in most instances, a person who is subjected to the alleged conduct will be able to control how the report is handled, including whether or not to pursue a formal investigation. The University's goal is to make sure you are aware of the range of options available to you and to ensure access to the resources you need.

Students wishing to discuss concerns in a confidential setting are encouraged to make an appointment with Counseling and Psychological Services (CAPS).

Students can learn more about filing a report, accessing supportive resources, and navigating the Title IX investigation and resolution process on the University's Title IX webpage.

Statement on Mental Health and Wellness

Texas A&M University recognizes that mental health and wellness are critical factors that influence a student's academic success and overall wellbeing. Students are encouraged to engage in healthy self-care by utilizing the resources and services available from Counseling & Psychological Services (CAPS). Students who need someone to talk to can call the TAMU Helpline (979-845-2700) from 4:00 p.m. to 8:00 a.m. weekdays and 24 hours on weekends. 24-hour emergency help is also available through the National Suicide Prevention Hotline (800-273-8255) or at suicidepreventionlifeline.org.

COVID-19 Temporary Addendum to Minimum Syllabus Requirements

The Faculty Senate temporarily added the following statements to the minimum syllabus requirements in Spring 2021 as part of the university's COVID-19 response.

Campus Safety Measures

To promote public safety and protect students, faculty, and staff during the coronavirus pandemic, Texas A&M University has adopted policies and practices for the Spring 2021 academic term to limit virus transmission. Students must observe the following practices while participating in face-to-face courses and course-related activities (office hours, help sessions, transitioning to and between classes, study spaces, academic services, etc.):

- Self-monitoring—Students should follow CDC recommendations for self-monitoring. **Students who have a fever or exhibit symptoms of COVID-19 should participate in class remotely if that option is available, and should not participate in face-to-face instruction.**
- Face Coverings—Face coverings (cloth face covering, surgical mask, etc.) must be properly worn in all non-private spaces including classrooms, teaching laboratories, common spaces such as lobbies and hallways, public study spaces, libraries, academic resource and support offices, and outdoor spaces where 6 feet of physical distancing is difficult to reliably maintain. Description of face coverings and additional guidance are provided in the Face Covering policy and Frequently Asked Questions (FAQ) available on the Provost website.
- Physical Distancing—Physical distancing must be maintained between students, instructors, and others in course and course-related activities.
- Classroom Ingress/Egress—Students must follow marked pathways for entering and exiting classrooms and other teaching spaces. Leave classrooms promptly after course activities have concluded. Do not congregate in hallways and maintain 6-foot physical distancing when waiting to enter classrooms and other instructional spaces.
- To attend a face-to-face class, students must properly wear an approved face covering If a student refuses to wear a face covering, the instructor should ask the student to leave and join the class

remotely. If the student does not leave the class, the faculty member should report that student to the Student Conduct office for sanctions. Additionally, the faculty member may choose to teach that day's class remotely for all students, or dismiss the class in the case of a traditional face to face lecture.

Personal Illness and Quarantine

Students required to quarantine must participate in courses and course-related activities remotely, if that option is available, and **must not attend face-to-face course activities**. Students should notify their instructors of the quarantine requirement. Students under quarantine are expected to participate in courses and complete graded work unless they have symptoms that are too severe to participate in course activities.

Students experiencing personal injury or Illness that is too severe for the student to attend class qualify for an excused absence (See Student Rule 7, Section 7.2.2.) To receive an excused absence, students must comply with the documentation and notification guidelines outlined in Student Rule 7.