



EE-320: Electronics-1, Section 1

COURSE SYLLABUS: FALL 2025 (8/24/2025)

INSTRUCTOR INFORMATION

Instructor:	Dr. Sharif, Sheikh
Office Location:	AG/ET #219
Office Hours:	AG/ET #219
Office Phone:	903-886-5960
Office Fax:	903-886-5960
University Email Address:	Sharif.Sheikh@etamu.edu
Preferred Form of Communication:	Email
Communication Response Time:	within 24 hours (weekdays)

COURSE INFORMATION

Class Meeting Schedule:	From 8/25/2025 to 12/13/2025. See course outline
Class and Lab Meeting Dates:	Monday and Wednesday, 3:00 – 5:00 PM
Classroom:	AG/ET #215 (lecture and lab)
Course Format:	This 3-credit course meets for 4 hours/week on campus
Textbook Required:	R. L. Boylestad and L. Nashelsky, Electronic devices and circuit theory, 11th Edition, Pearson Education, 2013.
Laboratory Manual:	A lab manual prepared for this course will be available to students in addition to the following: R. L. Boylestad, L. Nashelsky, and F. J. Monssen, Lab Manual for Electronic Devices and Circuit Theory, 11th Edition, Pearson Education, 2013. ISBN: 9780132622455
Optional References	S. Sedra and K. C. Smith, Microelectronic Circuits, 7th Edition, Oxford University Press, 2014
Software Required	MS Office, LTspice (free)
Optional Texts and/or Materials	Multisim software (available on school computers)

The syllabus/schedule are subject to change.

Course Description

This course is the first of two courses in the use of electronic devices in analog and digital circuits. The course covers characteristics of semiconductor devices; diodes, bipolar junction transistors (BJT), and field-effect transistors (FET). This course also covers diode applications, AC and DC analysis for BJT, models for electronic devices and circuit, analysis of diode, transistor, and FET amplifier circuits. The course has an associated Laboratory experiments set, which will require the use of simulation software (e.g. Multisim and PSpice) and hardware equipment.

Prerequisites: EE 220 with a minimum grade of C.

Student Learning Outcomes:

1. Describe the fundamental principles and theories in electronic circuits.
2. Explain the basic structure and the mechanism of operation of diodes and transistors, semiconductor devices.
3. Acquire knowledge on DC, AC, small-signal, and switching modes of operation of transistors.
4. Design, diagram, analyze, and interpret experiments in electronic systems
5. Practice and validate equivalent circuit models of electronic devices for various applications.
6. Practice the basic principles of signal-stage amplifiers and switches using electronic devices.
7. Acquire Lab work experience on fundamental concepts of semiconductor devices and their applications.
8. Operate modern software and numerical techniques to enhance teamwork and communications

COURSE REQUIREMENTS

Minimal Technical Skills Needed

Working knowledge and basic skills in using Microsoft Office products Word, Excel, and PowerPoint. Working knowledge and understanding of electrical circuits fundamentals covered in EE220.

Instructional Methods

The instructional methods will include lectures (modules), class discussions, course projects, assignments, problem-solving exercises, Lab reports, and simulations using software. Instructions will be based on the course textbook and on the Lab manual. Course materials, announcements, and lecture notes will be posted on the course website (D2L).

Tips for Success in the Course

Students must attend classes, participate in classwork and discussions, and complete the required course assessments that support the anticipated learning objectives. Students are expected to regularly log into the course website (D2L) to download course material, submit their coursework as instructed, and follow up on new announcements. This course covers more advanced content that requires at least 6 hours of extensive study per week.

Lab Safety Training

Students registered for this course must complete the required Lab safety training before entering the Lab and undertaking any activities. There are no exceptions to this University policy. Failure to complete the required training will preclude participation in Lab activities and assessments.

The syllabus/schedule are subject to change.

Assignment solutions:

Assignment solutions must be submitted by the specified due date mentioned on the D2L platform. Each homework assignment requires a separate solution report. Unless prior arrangements are made with the instructor, no late submission of assignment solutions will be permitted. Some homework assignments may require the submission of simulation files created using software. Any file that is flagged as infected with malware or viruses will not receive a grade.

Exams and Quizzes

The exams (midterm and final) will be closed-book & closed-notes. Relevant scientific formulas will be provided in the supplementary sheet. The student will need to bring a scientific calculator for the exam. The use of a personal phone (or any other smart device) is strictly prohibited during exams. A makeup exam may be offered, but an official permit for absence that fulfills University procedures should be available on time.

Make-up Assessments:

Make-up assessments (Assignments, lab reports, quizzes, exams) are generally not offered without valid, documented justification. When approved, make-up work should be completed within one week of the missed assessment (if possible). Early communication is essential, and approval is not guaranteed.

Academic Integrity:

The first incident of academic misconduct will result in a zero for the assessment; further violations may lead to a failing grade in the course. All incidents will be reported to the department chair. If you are unsure whether something constitutes academic dishonesty, consult the instructor before submission. Refer to the TAMUC Academic Integrity section (included on page 8) for additional details.

Attendance

Attendance will be taken at the beginning of the class. Make-up for a missed In-class assignment may be given only if you contact the instructor before the end of the class and there is a valid reason for the absence.

No. of unexcused absences	< 4	= 4	= 5	= 6	= 7	> 7
Grade penalty	0%	5%	10%	20%	30%	F

Because this course includes laboratory work, appropriate attire is required to reduce the risk of injury. Bluetooth earbuds or similar devices are not permitted while in the lab. For more information about the ETAMU attendance policy, please view the [Attendance Webpage](#) and the [Class Attendance Policy](#)

Lab Work

Students will perform simulations and experiments to study the characteristics and practical applications of semiconductor electronic devices, such as diodes, transistors, and FETs. The lab experiments will be supported by software simulation using LTspice and/or Multisim. Students will work in teams and must submit their reports in the specified format within one week.

Additional guidelines for Lab work:

- Proposed laboratory experiments are listed in the course outline below.
- Divide the class into groups to do Lab work, with 3-4 students/group.
- In Pre-Lab, you will be asked to design a circuit to perform a specific function (if applicable).

The syllabus/schedule are subject to change.

- Each group will need to submit a full report for each experiment.

Lab report should be constructed as follows:

1. **Cover page:** Your Lab report cover page should include the following information:
 - Course name and title
 - Experiment number and title
 - Names of team members and their IDs
 - Instructor's name.
 - Date of the experiment
2. **Objectives:** State clearly the objectives of the experiment.
3. **Equipment required:** List all the equipment and components used in the experiments.
4. **Introduction:** Provide a brief background to the problem that you are trying to solve in the Lab and the approach to solving it.
5. **Procedure:** Each part of the Lab experiment should explain the following:
 - Basic measurements and calculations
 - Brief explanation of the derived solution
 - Schematics were developed that demonstrate the solution
6. **Results and Analysis:** Each part of the Lab experiment should have the following:
 - Include measurement results. Also include a copy of the simulated schematic diagram and results (if applicable).
 - Include a picture (taken using a mobile phone) of the circuit you built in the Lab.
 - Analyze the measured data and produce necessary plots using Excel and/or MATLAB.
 - State the observations made while performing the Lab and an explanation of your results.
7. **Conclusions:**
 - Describe what you did and learned from the Lab.
 - Explain to what degree the objectives of the Lab were achieved.
 - Describe possible real-time applications from the work done in the Lab.

A Formal Lab report should enable someone else to duplicate your work and obtain the same results without reference to any other documents. Reference URL of data sheets. Graphics in your Lab reports may not be hand-drawn and prepared using a graphics program.

Lab reports are due before Lab time, one week after the Lab was performed. 10% per day will be deducted from the final Lab grade.

GRADING

Final Grade

Final grades in this course will be based on the following scale:

A = 90% - 100%

B = 80% - 89%

The syllabus/schedule are subject to change.

C = 70% - 79%

D = 60% - 69%

F = 59% or Below

Assessments

The following assessments will be used in this course to evaluate individual progress:

Assessment	Weight
Attendance and Participation	10%
Assignments	15%
Class Quizzes	10%
Midterm Exam	20%
Final Exam	20%
Lab Work + Project	(20 + 5)%

Relationship between Assessments and Learning Outcomes

Learning Outcomes of Instruction	Assessment
1. Describe the fundamental principles and theories in electronic circuits.	Assignments
2. Explain the basic structure and the mechanism of operation of diodes and transistors, semiconductor devices.	Assignments, Exams
3. Acquire knowledge on DC, AC, small-signal, and switching modes of operation of transistors.	Lab Work
4. Design, diagram, analyze, and interpret experiments in electronic systems	Quizzes, Exams, Lab Work
5. Practice and validate equivalent circuit models of electronic devices for various applications.	Assignments, Exams
6. Practice the basic principles of signal-stage amplifiers and switches using electronic devices.	Quizzes, Exams, Lab Work
7. Acquire Lab work experience on fundamental concepts of semiconductor devices and their applications.	Lab Work
8. Operate modern software and numerical techniques to enhance teamwork and communications	Assignments, Lab Work

The syllabus/schedule are subject to change.

COURSE and LAB OUTLINE

The instructor reserves the right to adjust the schedule to serve the needs of the class/lab, and any changes will be communicated promptly.

Syllabus Outline:			
Week	Lecture Topics	Descriptions	Laboratory Sessions
1 25 & 27 th Aug.	Semiconductor Diodes	Doped semiconductors, <i>pn</i> junction, Current flow, Ideal diode, Terminal characteristics of Junction Diodes (FB, RB.); Modeling of the Diode, Current-Voltage characteristics...	L1: Introduction to lab safety guidelines, equipment, and software
2 3 & 8 th Sep.			L2: Simulating Diode Characteristics and Applications Using LTspice
3 10 & 15 th Sep.	Zenner diodes	Zener Diode Current-voltage characteristics, Operation in the Reverse Breakdown Region,..	L3: Experimental Analysis of Diode Characteristics
4 17 & 22 nd Sep.	Classification and Applications of Diode	Half/Full wave and bridge Rectifiers. Ripple and PIV calculations, Voltage regulation. Diode Limiters and clippers, basics of LED, Varactor, Schottky and other types of diodes.... BJT Device structure, PNP, NPN,	L4: Full-Wave Rectifier: Design, and Simulation
5 24 & 29 th Sep.			L5: Measurement and Testing of a Full-Wave Rectifier
6 1 & 6 th Oct.	BJT: Fundamentals of Bipolar Junction Transistors	Modes of operation, Current-Voltage characteristics, Operating modes (amplifier and switch). Load line analysis, Operating point	Midterm exam
7 8 & 13 th Oct.	BJT Characteristics	BJT biasing techniques., DC gain (β), Small Signal Operation, and Models.	L6: Simulation of DC Biasing Techniques for Bipolar Transistors (BJT)
8 15 & 20 th Oct.	BJT Configurations	BJT Amplifiers: Common Emitter (CE), CE + Resistance, Common	L7: Measurement and Testing of DC Biasing Techniques for Bipolar Transistors (BJT)

The syllabus/schedule are subject to change.

Syllabus Outline:

Week	Lecture Topics	Descriptions	Laboratory Sessions
9 22 & 27 th Oct.		Base, Common Collector. Using BJT as a Switch.	L8: Design and Simulation of a Common-Emitter BJT Amplifier with Feedback Resistor.
10 29 th & 3 rd Nov.	FET: Fundamentals and categories of Field Effect Transistors	Device Structure, N and P-channel, Physical Operation of JFET and MOSFET, Current-Voltage Characteristics, Biasing techniques of MOSFET amplifiers	L9: Measurement and testing of a Common-Emitter BJT Amplifier with Feedback Resistor.
11 5 & 10 th Nov.	FET: MOSFET biasing characteristics	DC biasing techniques; Operating point and output voltage swing. Small Signal Operation	L10: PCB Implementation of a designed BJT CE Amplifier
12 12 & 17 th Nov.			L11: Project work:
13 19 & 24 th Nov.	FET: Introduction to MOSFET Amplifiers	Basic MOSFET Amplifiers, Common Source configuration, Comparison with Equivalent BJT CE Amplifiers	L12: Project work
14 26 th & 1 st Dec.	FET: Introduction to CMOS Inverters	Introduce the CMOS inverter and its applications in digital circuits	L13: Project work
15 3 rd Dec.	Review and Project Presentation		
16 6 th - 12 th Dec.	Final exam		

TECHNOLOGY REQUIREMENTS
LMS

All course sections offered by East Texas A&M University have a corresponding course shell in the myLeo Online Learning Management System (LMS: D2L's Brightspace). Below are the technical requirements

LMS Requirements:

<https://community.brightspace.com/s/article/Brightspace-Platform-Requirements>

LMS Browser Support:

https://documentation.brightspace.com/EN/brightspace/requirements/all/browser_support.htm

The syllabus/schedule are subject to change.

Zoom Video Conferencing Tool

https://inside.tamuc.edu/campuslife/CampusServices/CITESupportCenter/Zoom_Account.aspx?source=universalmenu

Communication and Support

If you have any questions or are having difficulties with the course material, please contact your Instructor.

Technical Support

If you are having technical difficulty with any part of Brightspace, please contact Brightspace Technical Support at 1-877-325-7778. Other support options can be found here: <https://community.brightspace.com/support/s/contactsupport>

STUDENT RESPONSIBILITIES FOR THE COURSE

CWID and Password

You will need your campus-wide ID (CWID) and password to log into the course. If you do not know your CWID or have forgotten your password, contact the Center for IT Excellence (CITE) at 903.468.6000 or helpdesk@etamu.edu during the office hours.

Technology-Related Issues

Personal computer and internet connection problems do not excuse the requirement to complete all coursework in a timely and satisfactory manner. Each student needs to have a backup method to deal with these inevitable problems. These methods might include the availability of a backup PC at home or work, the temporary use of a computer at a friend's home, the local library, office service companies, Starbucks, an ETAMU campus open computer lab, etc.

TECHNOLOGY REQUIREMENTS AND SUPPORT

Minimal Technical Skills Needed

Students will need a reliable computer and internet access for this course. Students must be able to effectively use myLeo email, myLeo Online D2L (Brightspace), and Microsoft Office.

Learning Management System (LMS) – D2L's Brightspace

All course sections offered by East Texas A&M University have a corresponding course shell in the myLeo Online Learning Management System (LMS). Below are the technical requirements:

- View the [Learning Management System Requirements Webpage](#).
- Learn more on the [LMS Browser Support Webpage](#).

Technical Support

If you are having technical difficulty with any part of Brightspace, please contact Brightspace Technical Support at 1-877-325-7778. Other support options can be found on the [Brightspace Support Webpage](#).

The syllabus/schedule are subject to change.

COMMUNICATION AND SUPPORT

Interaction with Instructor Statement

If you have any questions or are having difficulties with the course material, please contact your instructor. Correspondence will always be through university email (your “myLeo” mail) and announcements in myLeo online (D2L). You will not RECEIVE email through D2L, so be sure to check your ETAMU email for communication. Students are encouraged to check their university email daily.

Include the Following in Emails with the Instructor:

- Course name and subject in the subject line
 - Salutation (Good afternoon, Dr. Jackson)
 - Proper email etiquette (no “text” emails – use proper grammar and punctuation)
 - Student name and CWID after the body of the email
-

COURSE AND UNIVERSITY PROCEDURES/POLICIES

Syllabus Change Policy

The syllabus is a guide. Circumstances and events, such as student progress, may make it necessary for the instructor to modify the syllabus during the semester. Any changes made to the syllabus will be announced.

Student Conduct

All students enrolled at the University shall follow the tenets of common decency and acceptable behavior conducive to a positive learning environment. The [Code of Student Conduct](#) is described in detail online in the [Student Guidebook](#).

Students should also consult the [Rules of Netiquette Webpage](#) for more information regarding how to interact with students in an online forum.

ETAMU Attendance

For more information about the attendance policy, please view the [Attendance Webpage](#) and the [Class Attendance Policy](#)

Academic Integrity

Students at East Texas A&M University are expected to maintain high standards of integrity and honesty in all their scholastic work. For more details and the definition of academic dishonesty, see the following procedures:

[Undergraduate Academic Dishonesty University Procedure 13.99.99.R0.03](#)

[Undergraduate Student Academic Dishonesty Form](#)

[Graduate Student Academic Dishonesty University Procedure 13.99.99.R0.10](#)

[Graduate Student Academic Dishonesty Form](#)

Use of Artificial Intelligence

The syllabus/schedule are subject to change.

East Texas A&M University acknowledges that there are legitimate uses of Artificial Intelligence, Chatbots, or other software that have the capacity to generate text, or suggest replacements for text beyond individual words, as determined by the instructor of the course.

Any use of such software must be documented. Any undocumented use of such software constitutes an instance of academic dishonesty (plagiarism).

Individual instructors may disallow the use of such software for individual assignments or for the entire course. Students should be aware of such requirements and follow their instructors' guidelines. If no instructions are provided, the student should assume that the use of such software is disallowed.

In any case, students are fully responsible for the content of any assignment they submit, regardless of whether they used an AI in any way. This specifically includes cases in which the AI plagiarized another text or misrepresented sources.

Students with Disabilities-- ADA Statement

The Americans with Disabilities Act (ADA) is a federal anti-discrimination statute that provides comprehensive civil rights protection for persons with disabilities. Among other things, this legislation requires that all students with disabilities be guaranteed a learning environment that provides for reasonable accommodation of their disabilities. If you have a disability requiring an accommodation, please contact: **Office of Student Disability Resources and Services**

East Texas A&M University

Velma K. Waters Library Rm 162

Phone (903) 886-5150 or (903) 886-5835

Fax (903) 468-8148

Email: studentdisabilityservices@etamu.edu

Website: [Office of Student Disability Services](#)

Nondiscrimination Notice

East Texas A&M University will comply in the classroom and in online courses with all federal and state laws prohibiting discrimination and related retaliation on the basis of race, color, religion, sex, national origin, disability, age, genetic information, or veteran status. Further, an environment free from discrimination based on sexual orientation, gender identity, or gender expression will be maintained.

Campus Concealed Carry Statement

Texas Senate Bill - 11 (Government Code 411.2031, et al.) authorizes the carrying of a concealed handgun in East Texas A&M University buildings only by persons who have been issued and have a Texas License to Carry a Handgun. Qualified law enforcement officers or those who are otherwise authorized to carry a concealed handgun in the State of Texas are also permitted to do so. Pursuant to Penal Code (PC) 46.035 and ETAMU Rule 34.06.02.R1, license holders may not carry a concealed handgun in restricted locations.

For a list of locations, please refer to the [Carrying Concealed Handguns On Campus](#) document and/or consult your event organizer.

Pursuant to PC 46.035, the open carrying of handguns is prohibited on all East Texas A&M University campuses. Report violations to the University Police Department at 903-886-5868 or 9-1-1.

East Texas A&M Supports Students' Mental Health – Counseling Services

The syllabus/schedule are subject to change.

The Counseling Center at East Texas A&M University, located in the Halladay Building, Room 203, offers counseling services, educational programming, and connections to community resources for students. Students have 24/7 access to the Counseling Center's crisis assessment services by calling 903-886-5145. For more information regarding Counseling Center events and confidential services, please visit www.tamuc.edu/counsel

Mental Health and Well-Being

The university aims to provide students with essential knowledge and tools to understand and support mental health. As part of our commitment to your well-being, we offer access to TELUS Health, a service available 24/7/365 via chat, phone, or webinar. Scan the QR code to download the app and explore the resources available to you for guidance and support whenever you need it.



As an Institutional Member of the National Association of Schools of Music, East Texas State A&M University supports the Association's commitment to student health and wellness. The following web address provides links to information for resources related to physical and mental well-being, as well as assists in offering preventative measures that students can take to avoid serious and/or chronic conditions: [Musician Health and Safety - East Texas A&M University](#)

Department and Accrediting Agency Statements:

School of Music Mission Statement:

The School of Music at East Texas A&M University promotes excellence in music through the rigorous study of music history, literature, theory, composition, pedagogy, and the preparation of music performance in applied study and ensembles to meet the highest standards of aesthetic expression.
