
Syllabus for ELT-3060—Solid State Devices and Circuits

COURSE DESCRIPTION

Studies include analysis and design considerations for electronic amplifiers and power supplies using semiconductor devices. Class A amplifiers using bipolar transistors will be analyzed with emphasis on frequency response, power dissipation, and efficiency.

COURSE OBJECTIVES

After completing this course, you should be able to:

- CO 1** Distinguish between real and ideal voltage and current sources.
- CO 2** Identify the characteristics of a *pn* junction.
- CO 3** Identify various discrete device symbols.
- CO 4** Analyze power supply and amplifier circuits.
- CO 5** Identify models used for various devices.
- CO 6** Analyze single stage amplifiers.
- CO 7** Distinguish between various types of BJT amplifiers.
- CO 8** Identify important points on a frequency response curve.
- CO 9** Calculate both numerical and dB gain for an amplifier.

COURSE MATERIALS

You will need the following materials to complete your coursework. Some course materials may be free, open source, or available from other providers. You can access free or open-source materials by clicking the links provided below or in the module details documents. To purchase course materials, please visit the [University's textbook supplier](#).

Required Textbook

- Malvino, A. P., Bates, D. J., & Hoppe, P. (2020). *Electronic principles* (9th ed.). McGraw-Hill Higher Education (US).

ebook: ISBN: 978-1260447989

Print (if preferred): ISBN: 978-1259852695

Required Software

- *NI Circuit Design Suite* (package)—Student Edition, with NI Multisim (formerly Electronics Workbench Multisim). Download the current version via [Studica](#) or [Diligent](#).

Note: This is a Windows-based product and will not run on Macs. You can run this software and other Windows software on your Mac using Apple's Boot Camp technology or third-party virtualization tools like Parallels or VMWare Fusion. These tools make it possible to run macOS and a Windows operating system side by side. This solution will require a Windows license. This software package is required for ELE-2110, ELE-2120, and ELT-3060, ELT-3070, and ELC-2010.

Required Laboratory Kit

You are required to have **the following items** for the lab exercises:

- A Lab Kit consisting of the required electronic components (see ordering instructions below).
- A Digital Multimeter and a 9V battery (alkaline preferred).

Please click the following link to access instructions on how to order your lab kit: [Lab Kit Requirement—Ordering Instructions](#).

COURSE STRUCTURE

Solid State Devices and Circuits is a three-credit, online course consisting of **six** modules. Modules include an overview, topics, learning objectives, study materials, and activities. Module titles are listed below.

- **Module 1**
Course objectives covered in this module: CO 1, CO 2, CO 7
- **Module 2**
Course objectives covered in this module: CO 2, CO 3, CO 5
- **Module 3**
Course objectives covered in this module: CO 3, CO 4

- **Module 4**
Course objectives covered in this module: CO 3, CO 6
- **Module 5**
Course objectives covered in this module: CO 2, CO 4, CO 5, CO 6
- **Module 6**
Course objectives covered in this module: CO 2, CO 4, CO 5, CO 6

ASSESSMENT METHODS

Consult the Course Calendar for due dates.

Promoting Originality—One or more of your course activities may utilize a tool designed to promote original work and evaluate your submissions for plagiarism. More information about this tool is available in [this document](#).



Written Assignments

You are required to complete **six** written assignments. The written assignments consist of questions and problems taken from assigned chapters in your textbook. For each assignment, **answer all assigned questions, and show all work for assigned problems.**

Assignments must be prepared electronically using whatever word processing program you have on your computer. When preparing your answers, please identify each exercise clearly by chapter and exercise number. Include your name at the top of the paper, as well as the course name and code and the semester and year in which you are enrolled.

Before submitting your first assignment, check with your mentor to determine whether your word processing software is compatible with your mentor's software. If so, you can submit your work as you prepared it. If not, save your assignment as a rich-text (.rtf) file, using the Save As command of your software program. Rich text retains basic formatting and can be read by any other word processing program.



Lab Exercises

You are required to complete **five** lab exercises, one each in Modules 2, 3, 4, 5, and 6. The lab exercises require you to use NI Multisim software and the lab kit. There is no lab exercise in Module 1, but you are expected to get familiar with the use of the NI Multisim software during this period. Please follow the instructions provided in the Module 1 details document to complete this requirement.

For completing the lab assignment, please make a copy of the lab Google Docs file or download it as a

Word file, and then enter the answers. For providing the screenshots, the easiest way is to use the Windows Snipping Tool to capture the area of interest and insert the captured image into your document.

Module Quizzes

You are required to take an online quiz at the end of each of the six modules in this course. Each quiz consists of 20 multiple-choice questions based on your textbook readings. The quizzes are open book but time restricted (45 minutes).

Final Examination

You are required to take a proctored online final examination covering all material assigned in the course.

- The exam consists of questions and problems similar to those in the written assignments.
- You have 2½ hours to complete the final exam.
- The final exam is open book and open notes.

Note: You are permitted to use a calculator (scientific, graphing, or financial) but **may not** use a calculator on a phone, PDA, or any similar device.

For the exam, you are required to use the University's [Online Proctor Service](#) (OPS). Please refer to the "Examinations and Proctors" section of the Online Student Handbook (see [Student Handbooks](#) in the General Information area of the course website) for further information about scheduling and taking online exams and for all exam policies and procedures. You are strongly advised to schedule your exam within the first week of the semester.

Statement About Cheating

You are on your honor not to cheat during the exam. Cheating means:

- Looking up any answer or part of an answer in an unauthorized textbook or on the Internet, or using any other source to find the answer.
- Copying and pasting or in any way copying responses or parts of responses from any other source into your online test. This includes but is not limited to copying and pasting from other documents or spreadsheets, whether written by yourself or anyone else.
- Plagiarizing answers.
- Asking anyone else to assist you by whatever means available while you take the exam.
- Copying any part of the exam to share with other students.

- Telling your mentor that you need another attempt at the exam because your connection to the Internet was interrupted when that is not true.

If there is evidence that you have cheated or plagiarized in your exam, the exam will be declared invalid, and you will fail the course.

GRADING AND EVALUATION

Your grade in the course will be determined as follows:

- **Written assignments (6)**—25%
- **Lab exercises (5)**—25%
- **Module quizzes (6)**—25%
- **Final exam (proctored)**—25%

All activities will receive a numerical grade of 0–100. You will receive a score of 0 for any work not submitted. Your final grade in the course will be a letter grade. Letter grade equivalents for numerical grades are as follows:

A	= 93–100	C+	= 78–79
A–	= 90–92	C	= 73–77
B+	= 88–89	C–	= 70–72
B	= 83–87	D	= 60–69
B–	= 80–82	F	= Below 60

To receive credit for the course, you must earn a letter grade of C or better (for an area of study course) or D or better (for a course not in your area of study), based on the weighted average of all assigned course work (e.g., exams, assignments, discussion postings).

STRATEGIES FOR SUCCESS

First Steps to Success

To succeed in this course, take the following first steps:

- Read carefully the entire Syllabus, making sure that all aspects of the course are clear to you and that you have all the materials required for the course.
- Take time to read the entire Online Student Handbook. The Handbook answers many questions about how to proceed through the course, how to schedule exams, and how to get the most from your educational experience at Thomas Edison State University.
- Arrange to take your examination(s) by following the instructions in this Syllabus and the Online Student Handbook.

- Familiarize yourself with the learning management systems environment—how to navigate it and what the various course areas contain. If you know what to expect as you navigate the course, you can better pace yourself and complete the work on time.
- If you are not familiar with web-based learning be sure to review the processes for posting responses online and submitting assignments before class begins.

Study Tips

Consider the following study tips for success:

- To stay on track throughout the course, begin each week by consulting the Course Calendar. The Course Calendar provides an overview of the course and indicates due dates for submitting assignments, posting discussions, and submitting the final project.
- Check Announcements regularly for new course information.

Using AI Ethically: A Guide for TESU Students

TESU's [Academic Code of Conduct](#) permits student AI use in support of their writing and research process—not as a replacement for original writing. Document AI use with an acknowledgment statement at the end of each assignment, noting the tools and prompts used. Cite any AI-generated content on the References page. Please review [Using AI Ethically: A Guide for TESU Students](#) for more detailed information.

COMMITMENT TO DIVERSITY, EQUITY, AND INCLUSION

Thomas Edison State University recognizes, values, and relies upon the diversity of our community. We strive to provide equitable, inclusive learning experiences that embrace our students' backgrounds, identities, experiences, abilities, and expertise.

ACCESSIBILITY AND ACCOMMODATIONS

Thomas Edison State University adheres to the Americans with Disabilities Act (ADA, 1990; ADAAA, 2008) and Section 504 of the Rehabilitation Act of 1973. The Office of Student Accessibility Services (OSAS) oversees requests for academic accommodations related to disabilities; a student who is pregnant, postpartum, or a student parenting a newborn who is not the birth parent [as covered under NJSA18A]; and students requesting academic accommodation for a short-term/temporary illness and/or injury. Information can be found on the [Office of Student Accessibility Services](#) webpage and questions can be sent to ADA@tesu.edu.

ACADEMIC POLICIES

To ensure success in all your academic endeavors and coursework at Thomas Edison State University, familiarize yourself with all administrative and academic policies including those related to academic integrity, course late submissions, course extensions, and grading policies.

For more, see:

- [University-wide policies](#)
- [Undergraduate academic policies](#)
- [Undergraduate course policies](#)
- [Graduate academic policies](#)
- [Graduate course policies](#)
- [Nursing student policies](#)
- [Nursing graduate student policies](#)
- [International student policies](#)
- [Academic code of conduct](#)