

2025 IEEE REGION 3 SOUTHEAST CON

I. STUDENT CIRCUITS COMPETITION RULES

In the IEEE Region 3 Circuits Competition, IEEE students will be provided with a circuit design challenge, all material needed to complete the challenge, a set of deliverables, and timeline at the start of the competition. Students will then use the set amount of time to solve the challenge and complete as many deliverables as possible to the best of their ability.

Competition Timeline

Key Dates

January 1st , 2025	Registration for the Circuit Design Competition opens. Information on how to register for the competition will be posted on the Southeast Con 2025 website
February 22nd, 2025	Registration for the Circuit Design Competition closes.
March 28th, 2025	Circuit Design Competition occurs on site at SoutheastCon.

Competition Process

Below is a breakdown of the competition process. The remaining section of this document will address the details needed to complete each step:

1. Create your team and register for the competition
The team size is 3 students. Students can be undergrad or grad, however, a grad student counts as 2 students.
2. Arrive at SoutheastCon by the start of the competition to compete
Details on the competition timeframe will be posted with the SoutheastCon 2025 agenda.

What to expect

Students can expect the challenge and deliverables to be appropriate for students who have completed at least one year of EE/ECE classes. For this challenge, you will be charged with developing a proof-of-concept prototype. Based on design criteria, this device will take some defined input, that input will be processed by a circuit you design and fed into an ESP32 board. The processor will manipulate that input with the code you write and the output will also have to be processed by another circuit you design. That output will then be fed into another device that is provided. Some programming will need to be done for the ESP32 using the Arduino IDE. Some example code will be provided to help you in that task. The processing of the input and output may require the use of interface modules, op-amps, and transistors as well as resistors and capacitors. Parts of this design may require a knowledge of filters and signal processing.

What to bring

Students are allowed to bring text books and any notes/papers they feel might be helpful. Teams may bring up to one laptop apiece. The software to be announced may be installed on one or all laptops. Laptops should have Wi-Fi capability as you will want to make use of the Internet for resources, however; AI applications such as ChatGPT are not allowed for this competition.

This is a real-life simulation, and you are free to use outside knowledge resources but the work of the team must be your own. You can phone a friend, but they can't do the work for you.

Some of the software will require Windows 10/11 while others can use a Mac or Linux machine.

You will need to document your circuitry as well as demonstrate its operation. A laptop will need to have a word processing program (Word or equivalent) and we will provide you the access to a student edition of OrCAD schematic design software with Spice (the software also does PCB layout but we will not be laying out a PC board). There is also a PC interface to the handheld oscilloscope / DMM that will be available.

Scoring

This project, like any other, is on a budget. You will start out with a certain number of points. You will gain points by demonstrating each design challenge as well as documenting them. You will be provided with a set of basic tools, supplies, and equipment as well as parts – but you may need to 'buy' more parts or equipment with points (including replacing parts you 'fried' by applying excess or improper voltage). You can also gain points by completing your project early. And there may be the opportunity for extra points for adding 'enhancements' to your project. The exact criteria for all of these will be explained in detail at the start of the competition.