

BME2312 Analog Electronics Laboratory

General Information

Aim of the Analog Electronics Laboratory is to give students practical experience about the topics covered in the Analog Electronics course. Students will run experiments to observe the behaviors of the elements and circuits that they learn in the theoretical part of the course.

- Submit your report to the Responsible Research Assistant before the deadline given to you. Reports not submitted on time will not be evaluated. If you have not submitted your preliminary report, you cannot attend the laboratory course and receive 0 for the experiment.
- You should not be late for the experiment, otherwise students who are 5 minutes late will be considered absent.
- Food and drinks will never be brought into the laboratory.
- During the experiment, it is not possible to leave the experiment without permission.
- Equipment such as measuring instruments, cables, sources, and test sets to be used in the experiment should be used in their appropriate places and should not be damaged. In case of problems, the course instructors should be consulted.
- Each group will use the tools and equipment allocated to it; will work in the area allocated to him. The first thing to do before starting the experiment is to check whether the equipment is in working order. If any of the vehicles assigned to your group is faulty, be sure to inform the research assistants BEFORE starting the experiment.
- The measurements made in the experiment will be shown to the responsible research assistants. Absolutely no further experiment will be carried out without showing the results.
- At the end of the experiment, all electrical devices on the experiment table should be disconnected, the cables should be disconnected and replaced, and the stools and the table should be left in an orderly and clean manner. Otherwise, your experiment score will decrease.
- The grade the student will receive in the experiment that he/she does not attend is "0".
- Students who miss the experiment due to a valid reason will make up for the experiment they could not attend at the end of the semester.
- Students who miss more than one experiments will fail the course.

Analog Electronics Laboratory consists of 7 experiments listed in Table 1. Each experiment will be done after related topics are covered in the theoretical part of the course.

The responsible research assistant for this lab is **Res. Asst. Gamze DEMİREL ŞAHİN**. All announcements regarding this lab will be made on their AVESIS page (<https://avesis.yildiz.edu.tr/demirelg>). Students are responsible for regularly checking her AVESIS page.

Table 1 : Schedule

Experiment #	Topics	Date
Experiment 1	Circuit Theory	14.03.2024
Experiment 2	Diode Characteristics & Diode Applications 1 (Clipper Circuits)	21.03.2024
Experiment 3	Diode Applications 2 (Clamper & Rectifier Circuits)	28.03.2024
Experiment 4	MOSFET Characteristics	04.04.2024
Experiment 5	MOSFET Amplifier	25.04.2024
Experiment 6	Bipolar Junction Transistor (BJT) Characteristics	2.05.2024
Experiment 7	BJT Amplifier	9.05.2024
	Excuse	16.05.2024

Points to consider during experiments

1. When installing circuits, the voltage source must be off.
2. The correctness of the connections should be checked before applying voltage to the circuit.
 - a. Are the supply voltage and ground lines of the circuits connected correctly?
 - b. Can a short circuit occur between the supply voltage and the ground line?
 - c. Could an input sign have been accidentally applied to a line that has an output?
 - d. Could the outputs have been accidentally short-circuited?
 - e. Have the connections been made correctly to perform the desired operation in the experiment?
3. After ensuring that all connections are correct, supply voltage should be applied to the circuit. If the circuit does not work as expected, the supply voltage should be turned off immediately and the circuit should be checked. During the control process, the points mentioned in 2 should be taken into consideration.
4. Elements that are suspected of working correctly should be disconnected from the circuit and these elements should be tested separately.
5. When making changes to the circuit (adding/removing elements, changing connections), the voltage source must be off.
6. If, despite all efforts, the error cannot be identified, assistance should be sought from the Research Assistant.

Laboratory Operation and Grading

Each **group** must prepare a report before coming to each experiment. This report must contain the theoretical analyses and simulations of the circuits covered in the experiment. Students should also provide explanations/comments where necessary. Additionally, some experiments may require additional work to be done for the preliminary report (plotting in MATLAB etc.) so students should carefully read the experiment sheets for what is required for each experiment. Students should also build the circuits covered in each experiment in TinkerCAD and add the breadboard schema to their report. General grading criteria for reports is;

Introduction – 5, Theoretical Analyses – 30, Simulations – 40, Comments/Explanations – 10, TinkerCAD – 15. This criterion is only given to provide a general idea and may change from experiment to experiment.

A template will be shared for preliminary reports by the research assistant responsible for the lab. All reports must be written using the template. Points will be taken from reports written in a different format.

All or part of the report cannot be the same as all or part of the report of another group. Otherwise, both reports will be considered duplicates and even if they are successful in the experiment, they will be considered unsuccessful and discontinued.

Before each experiment, there will be a short **quiz** with the experiment. Quiz questions will measure whether you are prepared for the experiment.

In addition, your performance during the experiment will be evaluated according to the circuit you set up and the results you get.

Percentage distribution of reports, quiz and lab performance is given in Table 2.

Table 2: Grade Distribution of Experiment

Task	% Grade
Quiz	30
Lab Performance	50
Report	20