ECE 294-003: Analog and Digital Circuits Laboratory

Fall 2025

Instructor: Md Sen Bin Mustafiz

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Meeting times: Wednesday, 8:30 AM - 12:50 P.M., FMH 211

Credits, contact hours: 2 credits, 4 contact hours

Course Description

Laboratory work in the areas covered in ECE 231, ECE 232, and ECE 251. Assembling, testing and analysis of basic analog and digital circuits. Emphasis electronic measurement techniques, instrumentation and data analysis. Simulations and measurements of dc, ac, and transient response of basic analog circuits. Experiments and design of digital circuits from basic gates to complex logic, including sequential circuits, the arithmetic/logic unit, and computer memories.

prerequisites ECE 231, ECE 251, ENGL 101; corequisite: ECE 232

Course Learning Outcomes

• Combinatorial Circuits
• Sequential Circuits
• Shift Registers
• Counters
• Design Project – A Gate Function Detector
• Introduction to Basic Instruments, the Oscilloscope
• Superposition Principle and Thevenin Equivalent Circuits
• Internal Impedance of Instruments
• AC Measurements
• Input Impedance of an Oscilloscope and the Scope Probe
• The Diode and Diode Circuits
• The Transistor – Comparison of MOS and Bipolar

Grading

- Prelab: 30%
- Lab Report: 50%
- Participation/ Quiz: 20%

Deliverables

- Prelabs are to be completed individually at home by each student. These assignments must be submitted prior to the laboratory session.
- Students will be organized into groups of three for conducting experiments.
- Each group will prepare a single laboratory report based on the collective experimental results. While the results are shared across the group, individual students may present their own interpretation and explanation within the report.
- All students are required to upload both their Prelab and Laboratory Report to Canvas by the designated deadlines.

Academic Integrity:

"Academic Integrity is the cornerstone of higher education and is central to the ideals of this course and the university. Cheating is strictly prohibited and devalues the degree that you are working on. As a member of the NJIT community, it is your responsibility to protect your educational investment by knowing and following the code of Academic Integrity policy that is found at: NJIT Academic Integrity Code.

Please note that it is my professional obligation and responsibility to report any academic misconduct to the Office of the Dean of Students. **Any student found in violation of the code by cheating, plagiarizing, or using any online software inappropriately will result in disciplinary action. This may include a failing grade of F, and/or suspension or dismissal from the university.** *If you have any questions about the code of Academic Integrity, please contact the Office of the Dean of Students at dos@njit.edu."*