

# ENGR 3430: Eelectronics

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**Class Meetings:** MR 10:50 AM-12:30 PM in AC 304

**Credits:** 4 ENGR

**Hours:** 3-0-9

**Prerequisites:** ENGR 1125 (ISIM) and ENGR 2110 (PoE)

## Course Description:

Through a series of projects, students will learn all aspects of printed-circuit board (PCB) design at the prototype scale of manufacturing, including electronic circuit/system design, component selection, schematic capture, PCB layout, assembly, and testing. Familiarity with circuits, electronics, and firmware development at the levels of ISIM (ENGR 1125) and PoE (ENGR 2110) are required to take the course. This course satisfies the ECE elective requirement.

**Course Web Page:** <http://electronics.olin.edu>

**Grades:** 35% Miniprojects, 65% Projects.

There will be three individual miniprojects and one team project this semester. The three miniprojects will be small, relatively constrained individual project to learn the PCB design software (KiCad 5.0.2) that we will be using this semester and how to use the equipment in AC 329 to do surface-mount assembly and rework. The three miniprojects will take place during approximately the first five weeks of the semester. The final project will a team (2 or 3 students) project and will be much more open ended. There will be several graded milestones/deliverables for the final projects. The grade for a given miniproject/milestone/deliverable will generally be weighted in proportion to the duration of time between its due date and the and the due date of the preceding one.

**Learning Objectives:** At the end of this course, students will:

- Assess and select appropriate electronic components to design electronic systems of moderate complexity.
- Use modern tools to engineer electronic systems involving both hardware and software/firmware aspects.
- Balance trade-offs and make defensible choices among design alternatives.
- Use written, oral, and graphical communication to convey design ideas and solutions, electronic system analyses, and experimental results.

- Work effectively as a member of a project team.

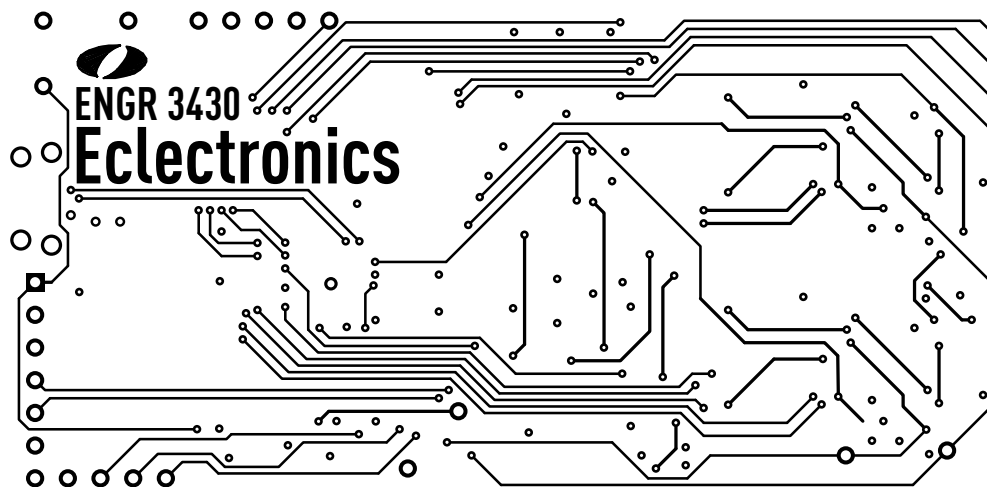
**Olin Learning Outcomes:** The following Olin Learning Outcomes (OLOs) are developed in this course:

- Develop and Apply Knowledge, Skills, Approaches, and Methods
- Think Critically
- Develop and Apply Creativity
- Collaborate Successfully
- Develop and Implement Processes to Achieve Desired Outcomes
- Communicate Effectively

**Text:** There is no required textbook for this course. Several helpful books are on reserve for the course at the Library and helpful links to electronic resources are available on the course website.

**Course Policies:**

*Late Assignments.* Late assignments will generally be penalized at a rate of 5% per day or fraction thereof up to a maximum of 50%.



**e-clec-tic** (ī-klĕk'tĭk) *adj.* **1.** Choosing what appears to be the best from diverse sources, systems or styles. **2.** Consisting of components selected from diverse sources. *-n.* One that follows an eclectic method. [Gk. *eklektikos*, selective < *eklegein*, to select : *ek-*, out + *legein*, to choose.]

**e-lec-tron-ic** (ī-lĕk'trŏn'ĭk, ē'lĕk-) *adj.* **1.** Of or pertaining to electrons. **2.** Of, pertaining to, based on, operating by, or otherwise involving the controlled conduction of electrons or other charge carriers, esp. in a vacuum, gas, or semiconducting material. **3.** Of or pertaining to electronics.

**e-clec-tron-ic** (ī-klĕk'trŏn'ĭk, ē'klĕk-) *adj.* Of, pertaining to, based on, operating by, or otherwise involving the controlled conduction of electrons in a collection of components that have been selected from diverse sources and that have been chosen as what appears to be the best from diverse sources, systems, or styles.