

## ECE 112 – Introduction to ECE: Concepts

**Catalog Description:** Basic Electrical and Computer Engineering concepts, problem solving and hands-on laboratory project. Topics include electronic circuit and device models, digital logic, circuit analysis, and simulation tools.

**Credits:** 3                      **Terms Offered:** Winter

**Prerequisites:** MTH 111 or MTH 112 or (MTH 251 or MTH 251H) or Math Placement Test score of 24 or higher

**Courses that require this as a prerequisite:** ECE 272

**Structure:** Two 50 minute lectures and one three hour lab per week

**Instructors:** R. Traylor

### Course Content:

- System design concepts
- Basic definitions of current and voltage
- Circuit elements and schematics
- Modeling circuits with voltage and current sources
- Applying Kirchoff's voltage and current laws
- Analyzing basic circuits with SPICE
- Analyzing basic transistor and diode circuits
- Understanding the terminal behavior of inductors and capacitors

### Measurable Student Learning Outcomes:

At the completion of the course, students will be able to...

1. **Solve** for values of current, voltage and power in simple direct current circuits using Kirchoff's Voltage and Current laws (ABET Outcomes: A, E, m)
2. **Analyze** basic direct current circuits with the circuit simulator SPICE (ABET Outcomes: A, E, K)
3. **Construct** a working programmable robot from a kit using basic electronic tools including soldering irons and multimeters (ABET Outcomes: K)
4. **Measure** values of current and voltage using laboratory instruments (ABET Outcomes: K)
5. **State** and **utilize** the voltage/current/time relationships of capacitors and inductors (ABET Outcomes: A, k, m)
6. **Simulate** and **construct** simple circuits using inductors and capacitors that utilize their unique terminal characteristics (ABET Outcomes: K)

**Learning Resources:**

- Instructor notes, linked from online syllabus
- Laboratory notes and manuals:  
<http://eecs.oregonstate.edu/education/resources/courses/ece112>
- TekBot kit, cost included in course fee
- Took kit (available for purchase if you do not have these already)
- Electrical Engineering Honor Society (HKN), and Freshman Mentor tutoring help

**Students with Disabilities:**

Accommodations are collaborative efforts between students, faculty and Disability Access Services (DAS). Students with accommodations approved through DAS are responsible for contacting the faculty member in charge of the course prior to or during the first week of the term to discuss accommodations. Students who believe they are eligible for accommodations but who have not yet obtained approval through DAS should contact DAS immediately at 737-4098.

**Link to Statement of Expectations for Student Conduct:**

<http://oregonstate.edu/admin/stucon/achon.htm>

Revised: 1/17/11

Revised Course Learning Outcomes: 9/15/14