

# ECE 2027 (Proposed): Introduction to Analog Systems and Circuits Lab for Transfer Students

## Course Description

Laboratory-only component of ECE 2020, for transfer students. Laboratory practice with circuit theory, analog systems, and applications of passive components and Op amps.

**Transcript Abbreviation:** AnlgSys&CircuitLab

**Grading Plan:** Letter Grade

**Course Deliveries:** Classroom

**Course Levels:** Undergrad

**Student Ranks:** Sophomore

**Course Offerings:** Autumn, Spring

**Flex Scheduled Course:** Never

**Course Frequency:** Every Year

**Course Length:** 14 Week

**Credits:** 0.5

**Repeatable:** No

**Time Distribution:** 3.0 hr Lab

**Expected out-of-class hours per week:** -1.5

**Graded Component:** Laboratory

**Credit by Examination:** No

**Admission Condition:** No

**Off Campus:** Never

**Campus Locations:** Columbus

**Prerequisites and Co-requisites:** Prereq: 2021 and CPHR 2.00 or above.

**Exclusions:** Not open to students with credit for 2020, 2100, 2100.02, 2100.07, 2100.08, 2127, 2137, 209, 292, or 294.03.

**Cross-Listings:**

**Course Rationale:** For transfer students with prior course comparable to lecture content of ECE 2020, but no comparable laboratory.

**The course is required for this unit's degrees, majors, and/or minors:** Yes

**The course is a GEC:** No

**The course is an elective (for this or other units) or is a service course for other units:** Yes

**Subject/CIP Code:** 14.1001

**Subsidy Level:** Baccalaureate Course

## Programs

Abbreviation	Description
CpE	Computer Engineering
EE	Electrical Engineering

## General Information

To be scheduled at same time as ECE 2020 lab sessions. Course consists of seven 3 hour labs rather than 14 1.5 hour labs, but are not synchronized with 7-week sessions.

## Course Goals

Be competent in implementing circuits using Ohm's Law, Kirchhoff's laws and superposition
Be competent in implementing RC, RL, and RLC circuits and characterizing their steady state and transient behavior
Be competent in implementing simple active filters based on ideal Op amps and characterizing their behavior
Be familiar with how to use modern computer tools for analog simulation
Be competent in how to use laboratory instruments and laboratory methodology
Be competent with methodology for critical troubleshooting skills
Be competent in reporting standards

## Course Topics

Topic	Lec	Rec	Lab	Cli	IS	Sem	FE	Wor
Introduction to Lab Equipment, troubleshooting skills			3.0					
Ideal op amp, feedback, active filters, cascaded active filters			3.0					
RC and RL first-order circuits, natural and total response, RC Op amp circuits			3.0					
Initial and Final Conditions, Series and Parallel RLC, General solution of second-order circuits			3.0					
RC, RL, RLC frequency response vs transient response			3.0					
Bode Plots, Passive and Active Filters			3.0					
Multisim circuit analysis			3.0					

## Representative Assignments

Lab reports
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## Grades

Aspect	Percent
Lab Reports	100%

## Representative Textbooks and Other Course Materials

Title	Author
<i>Circuits</i>	Ulaby and Maharbiz

## ABET-EAC Criterion 3 Outcomes

Course Contribution		College Outcome
***	a	An ability to apply knowledge of mathematics, science, and engineering.
***	b	An ability to design and conduct experiments, as well as to analyze and interpret data.
**	c	An ability to design a system, component, or process to meet desired needs.
**	d	An ability to function on multi-disciplinary teams.
***	e	An ability to identify, formulate, and solve engineering problems.
	f	An understanding of professional and ethical responsibility.

Course Contribution		College Outcome
	g	An ability to communicate effectively.
	h	The broad education necessary to understand the impact of engineering solutions in a global and societal context.
	i	A recognition of the need for, and an ability to engage in life-long learning.
	j	A knowledge of contemporary issues.
***	k	An ability to use the techniques, skills, and modern engineering tools necessary for engineering practice.

### Additional Notes or Comments

Adapted from ECE 2020 syllabus 10/6/2015 - gjv

Updated text info 5/9/17, CED

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