

# Syllabus for EEL 3112 – Circuits II

## 1. Catalog Description

Continuation of EEL 3111 with emphasis on circuit-enabled linear systems. Credits: 3.

## 2. Pre-requisites

EEL 3111-Circuits I, EEL 3135-Introduction to Signals & Systems.

## 3. Course Objectives

The topics in this course are part of the fundamental theory of electrical engineering and provide an in-depth analysis, design, and implementation skills in those areas of electrical engineering needed to solve problems in the domain of electrical engineering.

## 4. Contribution of course to meeting ABET professional component

Develop design and analysis skills and capabilities as they apply to basic electrical engineering circuit theory, practice, and applications.

## 5. Relationship of course to ABET program outcomes

EE1, EE2, a. k.

## 6. Instructor: Dr. Roozbeh Tabrizian

- a. Office location: Larsen 217
- b. Office hours: @ Larsen 217, Wed. (4:00pm – 6:00pm) or by appointment
- c. Telephone: 352-846-3017
- d. E-mail addresses: rtabrizian@ufl.edu
- e. Web site: <http://elearning.ufl.edu/>

## 7. Teaching Assistants: Jabari Wilson

- a. Office hour location: TBD
- b. E-mail address: jabari.wilson@ufl.edu
- c. Office hours: TBD

## 8. Meeting Times

T 7 (1:55pm - 2:45pm)  
R 7-8 (1:55pm - 3:50pm)

## 9. Class/Lab Schedule

Three 50-min. lectures per week.

## 10. Meeting Location

NEB 0202

## 11. Material and Supply Fees

None

## 12. Textbooks and Software Required

- a. Title: **Electric Circuits**  
 b. Authors: Nilsson / Riedel  
 c. Publication date and edition: 10<sup>th</sup> Ed., Prentice Hall, 2015  
 d. ISBN number: 978-0-133-76003-3

### 13. Recommended Reading

None

### 14. Course Outline (These may be adjusted as the course proceeds.)

Order	Topic	Dates (estimated)
1	Introduction, background, and Course Details <ul style="list-style-type: none"> <li>• Why Circuits 2 is important?</li> <li>• The significance of Circuits 2 in modern electronic systems</li> <li>• An overview of basic signals math</li> </ul>	
2	An overview of Circuits 1 <ul style="list-style-type: none"> <li>• Reviewing basic passive circuit elements</li> <li>• Reviewing basic circuit analysis techniques</li> </ul>	
3	Response of First-Order R-L and R-C Circuits <ul style="list-style-type: none"> <li>• A review on linear ordinary differential equations</li> <li>• Analysis of first-order circuits in time domain</li> <li>• Natural and step response</li> </ul>	HW1
4	First-Order Circuits with Sequential Switching	
5	First-Order Circuits with Active Components <ul style="list-style-type: none"> <li>• OpAmp overview</li> <li>• Integrating amplifier with sequential switching</li> </ul>	HW2
6	Second-Order R-L-C Circuits <ul style="list-style-type: none"> <li>• Natural response</li> <li>• Characteristic equation of second-order circuits</li> <li>• Concept of damped oscillation in passive circuits</li> <li>• Step response</li> </ul>	
7	Sinusoidal Steady-State Analysis <ul style="list-style-type: none"> <li>• Phasor domain analysis</li> </ul>	HW3
8	The Laplace Transform <ul style="list-style-type: none"> <li>• Introduction to Laplace transform basics</li> <li>• The demonstration of second-order circuit in Laplace domain</li> <li>• Inverse Laplace Transform</li> </ul>	
9	The Initial and Final Value Theorem	HW4
10	Application of Laplace Transform in Circuit Analysis <ul style="list-style-type: none"> <li>• Transient response of R-L-C circuit</li> <li>• Transfer function of linear circuits / systems</li> <li>• The transfer function and convolution integral</li> </ul>	
11	The Impulse Function in Circuit Analysis <ul style="list-style-type: none"> <li>• The relation of impulse response and transfer function</li> </ul>	HW5

12	The Fourier Transform <ul style="list-style-type: none"> <li>• Introduction to Fourier transform</li> <li>• Application in circuit analysis</li> </ul>	HW6
13	The Bode Plot	
14	Frequency Selective Circuits <ul style="list-style-type: none"> <li>• Passive filters</li> <li>• Active filters</li> <li>• The challenge of filters in 5G era</li> </ul>	HW7

### 15. Attendance and Expectations

Students are expected to attend class lectures and arrive on time. Please turn off cell-phones, pagers, and other electronic devices.

### 16. Grading

- Homework: **20%** (7 assignments)
- Two in-class exams: **25% + 25%**
- Final exam: **30%**

### 17. Grading Scale

Numeric Cutoff	Letter Grade	Grade Points
90	A	4.00
87	A-	3.67
83	B+	3.33
80	B	3.00
77	B-	2.67
73	C+	2.33
70	C	2.00
67	C-	1.67
63	D+	1.33
60	D	1.00
57	D-	0.67
<57	E	0.0

### 18. Make-up Exam Policy

Homeworks: **DUE AT BEGINNING OF CLASS PERIOD**

**-10% if turned in after lecture begins**

**-20% if turned in after lecture ends** (up to one business day late)

Exams: No make-up unless prior written documentation from Dean of Students, Physician, or Judge.

### 19. Honesty

UF students are bound by The Honor Pledge which states, “*We, the members of the University of Florida community, pledge to hold ourselves and our peers to the highest standards of honor and integrity by abiding by the Honor Code.*” On all work submitted

for credit by students at the University of Florida, the following pledge is either required or implied: “On my honor, I have neither given nor received unauthorized aid in doing this assignment.” The Honor Code (<http://www.dso.ufl.edu/sccr/process/student-conduct-honor-code/>) specifies a number of behaviors that are in violation of this code and the possible sanctions. Furthermore, you are obligated to report any condition that facilitates academic misconduct to appropriate personnel. If you have any questions or concerns, please consult with the instructor or TAs in this class.

**\*\*\*CHEATING, COPYING, or PLAGERISM will result in a ZERO ON THE ASSIGNMENT, and DISCIPLINARY ACTION WILL BE PURSUED** (see <https://www.dso.ufl.edu/sccr>)

## 20. Course Evaluations

Students are expected to provide feedback on the quality of instruction in this course by completing online evaluations at <https://evaluations.ufl.edu>. Evaluations are typically open during the last two or three weeks of the semester, but students will be given specific times when they are open. Summary results of these assessments are available to students at <https://evaluations.ufl.edu/results/>.

## 21. Accommodations

Students with disabilities requesting accommodations should first register with the Disability Resource Center (352-392-8565, [www.dso.ufl.edu/drc/](http://www.dso.ufl.edu/drc/)) by providing appropriate documentation. Once registered, students will receive an accommodation letter, which must be presented to the instructor when requesting accommodation. Students with disabilities should follow this procedure as early as possible in the semester.

## 22. UF Counseling Services

Resources are available on-campus for students having personal problems or lacking clear career and academic goals. The resources include:

- University Counseling and Wellness Center, 3190 Radio Road, 392-1575, Personal and Career Counseling.  
<http://www.counseling.ufl.edu/cwc/Default.aspx>
- Student Health Care Center, 392-1171, Personal and Counseling.  
<http://shcc.ufl.edu/>
- Career Resource Center, Reitz Union, 392-1601, career development assistance and counseling.

## 23. Software Use

All faculty, staff and student of the University are required and expected to obey the laws and legal agreements governing software use. Failure to do so can lead to monetary damages and/or criminal penalties for the individual violator. Because such violations are also against University policies and rules, disciplinary action will be taken as appropriate. We, the members of the University of Florida community, pledge to uphold ourselves and our peers to the highest standards of honesty and integrity.