

Saint Louis University, Madrid Campus
Division of Science & Engineering

Course name: Electrical Circuits II

Course code: ECE-2102

Prerequisites: Engineering Circuits I (ECE-2101)

Instructor: Taieb Gasmi, PhD

Semester: Spring 2018

Credit Hours: 3

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Phone: 915545858, Ext. 217

Office hours: 12:00-12:50

Last Day to ADD/Drop a Class: Sunday, January 21.

Last Day to Drop a Class and Receive a Grade of W: Friday, March 9.

Course description:

AC power analysis, single-phase and three-phase, power factor correction; first order and second circuits; maximum power transfer and matching theorems, magnetically coupled circuits, self and mutual inductances, series and parallel resonant circuits; passive filters and active filters; Laplace transform and its applications, Laplace transform transfer function; Fourier transform and its applications; two-port networks and parameters.

Course Objectives:

- Make students aware of using basic laws and theorems of single-phase and poly-phase AC circuits, and their analysis.
- Introduce students to the Laplace transform and its applications in circuit analysis.
- Introduce students to the Fourier series and Fourier transform and their applications in circuit analysis
- Familiarize students with filters, their transfer functions, graphical representations, and implementations

Course Outcomes:

On successful completion, the students should:

- Fully understand the concept of sinusoidal-steady-state and using the impedance method to analyze the sinusoidal-steady-state response of first and second-order electronic circuits;
- Gain an understanding of the role of the power flow and energy storage in electronic circuits at a specific instant of time.
- Have an intuitive insight into the behavior of a physical system driven near resonance, in particular the relationship to the transient response and the significance of the quality factor Q.
- Be able to use the Laplace and Fourier transform in linear circuits to solve the differential equations and calculate the frequency response.
- Become familiar with the concept of four-terminal or two-port devices and know how to analyze them using transfer impedance parameters.

Textbooks:

- Foundations of Electrical Engineering
J.R. Cogdell
Prentice Hall
- Electric Circuits
James W. Nilsson, Susan A. Riedel. Prentice Hall

Grading system:

The grade will be obtained from the following areas:

Homework: **10%**

First mid-term exam: **25%**

Second mid-term exam: **25%**

Final exam: **40%**

Grading Scale:

A	90-100%
A-	87-89%
B+	84-86%
B	80-83%
B-	77-79%
C+	74-76%
C	70-73%
C-	66-69%
D	60-65%
F	< 60%

Examinations:

First midterm: Week of February 19

Second midterm: Week of March 26.

Final exam: 9 May (Wd), 08:30-11:30

Course Outline:

Week	Topic
1 & 2 & 3	Analysis of AC Circuits: <ul style="list-style-type: none"> - Introduction to alternating current - Phasors and complex impedance - Phasors diagrams for RL, RC and RLC circuits
4 & 5	Power in AC Circuits <ul style="list-style-type: none"> - AC power and energy storage: time domain - Power and energy: frequency domain - Transformer
6 & 7	Electric Power Systems <ul style="list-style-type: none"> - Three phase power - Power distribution systems - Electric motors
8 & 9	Introduction to the Laplace Transform <ul style="list-style-type: none"> - Definition - Step function - Impulse function - Functional transform - Applying Laplace transform - Inverse transform and inverse problems
10 & 11	Laplace & Fourier Transforms in Circuit Analysis <ul style="list-style-type: none"> - Circuit elements in the S-domain - Circuit analysis in the S-domain - Application

	- Transfer function - Transfer function and convolution integral
12	Review week and final exam

IMPORTANT DATES:

JANUARY	
Wednesday 10	First Day of Classes
Sunday 21	Last Day to Drop a Class without a Grade W and/or Add a Class; Last Day to Choose Audit (AU) or Pass/No Pass (P/NP) Options
Friday 26	No Classes Application Deadline for Spring Semester Degree Candidates
FEBRUARY	
Wednesday 14	Ash Wednesday Registration for Summer 2018 Begins
Thursday 22	No Classes (Winter Break)
Friday 23	
Tuesday 27	Professors' Deadline to Submit Midterm Grades
MARCH	
Friday 9	Last Day to Drop a Class and Receive a Grade of W
Thursday 15	Last Day to Submit Transfer Application for Fall Semester
Monday 26	<i>Semana Santa</i> Holiday (Campus Closed)
Tuesday 27	
Wednesday 28	
Thursday 29	<i>Jueves Santo</i> (Campus Closed)
Friday 30	<i>Viernes Santo</i> (Campus Closed)
APRIL	
Wednesday 4	Registration for Fall 2018 Semester Begins
MAY	
Tuesday 1	<i>Día del Trabajador</i> (Campus Closed)
Wednesday 2	<i>Día de la Comunidad</i> (Campus Closed)
Thursday 3	Spring 2018 Final Day of Classes
Friday 4	Spring 2018 Final Exams
Monday 7	
Tuesday 8	
Wednesday 9	
Thursday 10	
Friday 11	University Housing Move-out Date
Saturday 12	Commencement
Sunday 13	Professors' deadline to submit spring 2018 final grades

Policies:

- (1) Students are encouraged to participate in class discussions and to ask questions.
- (2) Announcements may be made during the semester.
- (3) Useful information for the course may be found on the web:
<http://portal.sluiberica.slu.edu/webct/index.html>
- (4) Syllabus, reading and homework problems are subject to change.
- (5) Students are responsible for all lecture material, handouts, homework and assigned reading.
- (6) Students are expected to attend all classes unless a reasonable excuse is given.

(7) Make up exams are not given. Students who legitimately miss an exam, due to a doctor's visit or family emergency must provide written documentation of the circumstances. A letter from the university counselor is accepted. Exams that are missed illegitimately result in a score of F. Grades for these students will be based on the remaining exams. Missing more than one exam results in an F grade.

(8) University Statement on Academic Integrity: Academic integrity is honest, truthful and responsible conduct in all academic endeavors. The mission of Saint Louis University is "the pursuit of truth for the greater glory of God and for the service of humanity." Accordingly, all acts of falsehood demean and compromise the corporate endeavors of teaching, research, health care and community service via which SLU embodies its mission. The University strives to prepare students for lives of personal and professional integrity, and therefore regards all breaches of academic integrity as matters of serious concern.

The governing University-level Academic Integrity Policy can be accessed on the Provost's Office [website](#). Additionally, SLU-Madrid has posted its academic integrity policy online: <http://www.slu.edu/madrid/academics>. As a member of the University community, you are expected to know and abide by these policies, which detail definitions of violations, processes for reporting violations, sanctions and appeals.

The professor will review these matters during the first weeks of the term. Please direct questions about any facet of academic integrity to your faculty, the chair of the department of your academic program, or the Academic Dean of the Madrid Campus.

(9) Title IX Syllabus Statement

Saint Louis University and its faculty are committed to supporting our students and seeking an environment that is free of bias, discrimination, and harassment. If you have encountered any form of sexual misconduct (e.g. sexual assault, sexual harassment, stalking, domestic or dating violence), we encourage you to report this to the University. If you speak with a faculty member about an incident of misconduct, that faculty member must notify SLU's Title IX deputy coordinator, Marta Maruri, whose office is located on the ground floor of Padre Rubio Hall, Avenida del Valle, 28 (mmaruri@slu.edu; [915-54-5858 ext. 213](tel:915-54-5858)) and share the basic fact of your experience with her. The Title IX deputy coordinator will then be available to assist you in understanding all of your options and in connecting you with all possible resources on and off campus.

If you wish to speak with a confidential source, you may contact the counselors at the SLU-Madrid's Counseling Services on the third floor of San Ignacio Hall (counselingcenter-madrid@slu.edu; [915-54-5858 ext. 230](tel:915-54-5858)) or Sinews Multipletherapy Institute, the off-campus provider of counseling services for SLU-Madrid (www.sinews.es; [91-700-1979](tel:91-700-1979)) To view SLU-Madrid's sexual misconduct policy and for resources, please visit the following web address:

<http://www.slu.edu/Documents/Madrid/campus-life/SLUMadridSexualMisconductPolicy.pdf>

(10) Students with Special Needs: In recognition that people learn in a variety of ways and that learning is influenced by multiple factors (e.g., prior experience, study skills, learning disability), resources to support student success are available on campus. Students who think they might benefit from these resources can find out more about:

- Course-level support (e.g., faculty member, departmental resources, etc.) by asking your course instructor.

- University-level support (e.g., tutoring/writing services, Disability Services) by visiting the Academic Dean's Office (San Ignacio Hall) or by going to <https://www.slu.edu/madrid/academics/student-resources>.

Students with a documented disability who wish to request academic accommodations must contact Disability Services to discuss accommodation requests and eligibility requirements. Once successfully registered, the student also must notify the course instructor that they wish to access accommodations in the course. Please contact Disability Services at disabilityservices-madrid@slu.edu or +915 54 58 58, ext. 230 for an appointment. Confidentiality will be observed in all inquiries. Once approved, information about the student's eligibility for academic accommodations will be shared with course instructors via email from Disability Services. For more information about academic accommodations, see "Student Resources" on the SLU-Madrid webpage.

Note: Students who do not have a documented disability but who think they may have one are encouraged to contact Disability Services.

(IF APPLICABLE): Mandatory Trips/Activities: Students enrolled in this class must participate and make payment for all mandatory trips/activities. The prices posted on the web are approximate; the final price will be based on the number of students enrolled on the last day of the Add/Drop period. All students, including those who withdraw from the class after this date, are required to pay these fees, which are non-refundable, unless the trip is cancelled due to low enrollment. Please review SLU-Madrid's trip policies, available on-line.

Final Exam Schedules Spring 2018

	4 May (Fr)	7 May (Mn)	8 May (Tu)	9 May (Wd)	10 May (Th)
08:30-11:30	Mn classes that meet at 9:00 & 9:30	Mn classes that meet at 10:00	Mn classes that meet at 11:00 & 11:30	Tu classes that meet at 9:30	Tu classes that meet at 8:00
12:00-15:00	Tu classes that meet at 11:00	Mn classes that meet at 13:00	Tu classes that meet at 14:30	Mn classes that meet at 12:00 & 12:30	Tu classes that meet at 12:30
15:30-18:30	Mn classes that meet at 14:30	Tu classes that meet at 17:00 & 17:30	Mn classes that meet at 16:00	Tu classes that meet at 16:00	Mn classes that meet at 17:30
19:00-22:00	---	---	Mn classes that meet at 18:30 & 19:00	Tu classes that meet at 19:00	---

Abet Accreditation

The Accreditation Board for Engineering and Technology (ABET) is a federation of 31 professional engineering and technical societies. Since 1932, ABET has provided quality assurance of education through accreditation. ABET accredits more than 2500 engineering, engineering technology, computing and applied science programs at over 550 colleges and universities nationally. ABET is recognized by the Council on Higher Education Accreditation.

Program Educational Objectives

1. Educate students to be qualified for the profession of engineering.
2. Provide a foundation for life-long learning.
3. Encourage and prepare students to pursue graduate degrees.

Program Outcomes

- (3a) Ability to apply knowledge of math, science and engineering
- (3b) Ability to design and conduct experiments; analyze and interpret data
- (3c) Ability to design system, component, or process to meet needs
- (3d) Ability to function on multi-disciplinary teams
- (3e) Ability to identify, formulate, and solve engineering problems
- (3f) Understanding of professional and ethical responsibility
- (3g) Ability to communicate effectively
- (3h) Broad education necessary to understand impact of engineering solutions in a global and societal context
- (3i) Recognize need for and ability to engage in life-long learning
- (3j) Knowledge of contemporary issues
- (3k) Ability to use techniques, skills and modern engineering tools necessary for engineering practice