

Saint Louis University, Madrid Campus
Division: Sciences & Engineering

ECE-2101-M01: Electrical Circuits I

Class Days and Time: TR: 11:00-12:15

Classroom: PAH 202 [T.Gasmi's Office]

Prerequisites: Calculus II (MATH-1520), PHYS-1610 and Introduction to Electrical Engineering ECE-1010

Credit Hours: 3

Instructor name: T.Gasmi, PhD

Instructor's e-mail: Taieb.gasmi@slu.edu

Instructor's Campus Phone: 915545858, Ext. 217

Office hour: MWRF: 12:15-13:15. Please make sure to take advantage of office hours, as they offer a wonderful opportunity for individual interaction.

Course Description: Current analysis. Study of the physical foundation of electrical circuits; Ohm's law; Kirchoff's law; Loop and Mesh analysis; Thevenin's and Norton's equivalent circuits; Principle of superposition; Transient Response of simple RL, RC and RLC circuits; Operational amplifiers

Course Goals (with corresponding [ABET Criteria/outcomes](#)):

Ensure students:

- Understand the basic concepts of Ohm's Law and Kirchoff's Voltage and Current Laws. (Criterion 3(a))
- Understand the analysis process of dc and ac circuits with multiple energy sources, both independent and dependent. (Criteria 3(a),(e))
- Understand and derive first-order differential equations describing unknown electrical parameters in transient analysis. (Criteria 3(a),(e))
- Understand the analysis process of circuits with ideal operational amplifiers. (Criteria 3(a),(e))

Learning outcomes:

At the end of this course, students should be able to:

1. Analyze simple DC circuits using systemic analysis techniques.
2. Apply Thevenin's theorem, Norton's theorem and the superposition theorem to aid in circuit analysis.
3. Explain AC steady-state circuit concepts (impedance, reactance, etc) and perform AC steady state analysis.
4. Analyze Transient Response of simple RL, RC and RLC circuits
5. Perform voltage and current gain calculation and analysis of ideal operational amplifiers
6. Analyze one pole-two poles filters.

Saint Louis University - Madrid Campus is committed to excellent and innovative educational practices. In order to maintain quality academic offerings and to conform to relevant accreditation requirements, the Campus regularly assesses its teaching, services, and programs for evidence of student learning outcomes achievement. For this purpose anonymized representative examples of student work from all courses and programs is kept on file, such as assignments, papers, exams, portfolios, and results from student surveys, focus groups, and reflective exercises. Thus, copies of student work for this course, including written assignments, in-class exercises, and exams may be kept on file for institutional research,

assessment and accreditation purposes. If students prefer that Saint Louis University - Madrid Campus does not keep their work on file, they need to communicate their decision in writing to the professor.

Assessment Methods

Direct assessments throughout the course: Outcomes learnt in course work are assessed via corrected homework, quizzes, exams and projects.

Indirect assessment: Outcomes learnt are also collected to provide information about student perception of their learning and how this learning is valued by them. Indirect assessment is therefore obtained from the post-first midterm and end-of-term online evaluations.

Textbook and Material:

1. "Foundation of Electrical Engineering"
J.R Cogdell; Prentice hall
2. "Electrical Circuits"
(Nielsson and Riedel) ; Addison-Wesley

Reference books: Schaum's Outline: Theory and Problems of Electric Circuits, Nahvi & Edminster, McGraw-Hill.

Attendance and Class Policy:

- (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 Blackboard web:
<https://blackboard.slu.edu/>
- (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.**

Course Requirements and Grading Rationale/System:

E-mail: Campus and course announcements will often be handled by e-mail. Students should check their "@slu.edu" e-mail regularly.

- (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://www.slu.edu/madrid/academics/courses-and-syllabi>
- (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. 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.

Grading system: The grade will be obtained from the following areas:

Homework: **10 %**

Mid-term Exam (1 & 2): **25 % each**

Final Exam: **40 %**

Grading Scales:

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%

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 at: <http://www.slu.edu/madrid/academics>. 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.

University Title IX 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) 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) or Sinews Multipletherapy Institute, the off-campus provider of counseling services for SLU-Madrid (www.sinews.es; 917-00-1979). 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>.

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 <http://www.slu.edu/madrid/learning-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.

Fall 2017 Course Schedule:

Monday, September 4	Fall 2017 first day of classes
Sunday, September 17	Last Day to Drop a Class Without a Grade of W and /or Add a Class, choose Audit (AU) or Satisfactory/Unsatisfactory (S/U) Options
Thursday, October 12	Fall Break
Friday, October 13	
Saturday, October 14	
Sunday, October 15	
Thursday, October 19	Midterm Grades Due.
Monday, October 30	Last Day to Drop a Class and Receive the Grade of W.
Wednesday, November 1	University Closed
Thursday, November 2	Spring Registration Opens!
Thursday, November 9	University Closed
Wednesday, December 6	University Closed
Friday, December 8	University Closed
Thursday, December 14	Final Exam – Day 1
Friday, December 15	Final Exam – Day 2
Monday, December 18	Final Exam – Day 3 Midyear Commencement!
Tuesday, December 19	Final Exam – Day 4
Wednesday, December 20	Final Exam – Day 5
Saturday, December 23	Grades Due to Registrar

Fall 2017 Final Exam Schedule

	14 Dec (Th)	15 Dec (Fr)	18 Dec (Mn)	19 Dec (Tu)	20 Dec (Wd)
08:30-11:30	Mn classes that meet	Mn classes that meet	Mn classes that meet	Tu classes that meet	Tu classes that meet

	at 9:00 & 9:30	at 10:00	at 11:00 & 11:30	at 9:30 & 10:00	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	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 15:30 & 16:00	Mn classes that meet at 17:30
19:00-22:00	---	---	Mn classes that meet at 19:00	Tu classes that meet at 19:00	---

Course Outline:

Week	Topic
1	Electrical charge and Electrical Energy: <ul style="list-style-type: none"> - Physical basis of circuit theory - Current and Voltage Kirchhoff's laws
2	DC Circuits Analysis <ul style="list-style-type: none"> - Energy flow in Electrical circuits - Ohm's law - Series and Parallel resistors
September 14	Last day to drop a class without a grade of W and/or add a class
3	DC Circuits Analysis <ul style="list-style-type: none"> - Superposition theorem - Voltage and Current dividers
4,5	DC Circuits Analysis <ul style="list-style-type: none"> - Thevenin's and Norton's equivalent Circuits - Source transformations
6,7	DC Circuits Analysis <ul style="list-style-type: none"> - Node-voltage analysis - Loop-Current Analysis
8 & 9	Dynamics of Circuits: <ul style="list-style-type: none"> - Theory of Inductors and Capacitors - First order response of RL and RC Circuits - Second Order Response - Advanced Techniques
10 & 11	Operational Amplifiers <ul style="list-style-type: none"> - Frequency Domain - Analysis of Op-Amps - Linear circuits: Amplifiers, Inverters, Adders, Integrators, Differentiators
12	Filters: <ul style="list-style-type: none"> - One pole-two poles
13-14	Review week and Final Exam.
Examinations	Final exams schedule available at: http://www.slu.edu/madrid/academics/registrar/final-exam-schedule/2016-2017 Mid-term 1 Examination: Week of October 10 Mid-term 2 Examination: Week of November 7

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 electrical 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
- (8l) Knowledge of probability and statistics, including applications appropriate to the program name and objectives
- (8m) Knowledge of mathematics through differential and integral calculus, basic sciences, and engineering sciences necessary to analyze and design complex devices and systems containing hardware and software components, as appropriate to program objectives
- (8n) Knowledge of advanced mathematics, typically including differential equations, linear algebra, complex variables, and discrete mathematics
- (ee1) Prepared to work in industry, if so desired.
- (ee2) Manifests "hands-on" educational skills that blend both theory and practice