

Saint Louis University, Madrid Campus
Division: Science & Engineering

Course name: Introduction to Electrical Engineering

Course Code: ECE-2001

Prerequisites: PHYS 161 & MATH 143

Semester: Spring 2018.

Professor: T.Gasmi Ph.D

Credit Hours: 3

Office Hour: 12:00-12:50

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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:

Basic circuit laws, power and energy concepts. DC circuit analysis: node /mesh analysis and network reduction. AC circuit analysis: inductors and capacitors, phasor notation, rms values and complex power concepts. Operational features of diodes and transistors; transformer and principles of electromagnetic conversion. Principles of operational amplifier circuit analysis including basic active filter design.

Course Objective:

This is a basic course in electrical engineering designed to provide:

- Thorough, comprehensive and practical coverage of basic electrical concepts and circuits.
- Both DC and AC topics are presented with typical applications covered in the laboratory.
- Topics covered in this course will allow students to acquire the concepts and tools needed for further education in the field of electrical engineering, mainly circuit theory, as well as gaining an introduction to electronics, electrical apparatus and machines.

Learning Outcomes and Performance Objectives

Learning Outcome 1: Students will be able to calculate current, voltage, energy, and power values from nominal component values and parameters for simple electric circuits.

Performance Objectives and Method of Measurement: Students will utilize Ohm's Law, Kirchoff's Current Law, and Kirchoff's Voltage Law to solve homework and exam problems for specified circuit variables. The accuracy and completeness of their solutions will be measured by the evaluation and scoring of these items by the instructor.

Learning Outcome 2: Students will be able to analyze Direct Current (DC) and Alternating Current (AC) and transient circuits using Node-Voltage, Mesh-Current, Phasor, Thevenin and Norton methods of circuit analysis.

Performance Objectives and Method of Measurement: Students will demonstrate application of Node-Voltage, Mesh-Current, Phasor, Thevenin and Norton equivalent circuit techniques to determine specified circuit variables in the solution of homework and exam problems in AC and DC circuits consisting of resistors, capacitors, inductors, and voltage/current sources. The accuracy and completeness of their results will be measured by the evaluation and scoring of these items by the instructor

Learning Outcome 3: Students will understand the basic principles and operation of transformers and electric motors.

Performance Objectives and Method of Measurement: Students will utilize the basic operating principles of transformers and AC/DC motors in the solution of homework and exam problems. The accuracy and completeness of their work will be measured by the evaluation and scoring of these items by the instructor.

Learning Outcome 4: Students will know the basic characteristics and applications of solid-state electronic circuit components and operational amplifiers.

Performance Objectives and Method of Measurement: Students will be required to analyze simple operational amplifier circuits involving diodes, transistors, basic amplifiers, and various types of operational amplifier circuits in the solution of homework and exam problems. The accuracy and completeness of their work will be measured by the evaluation and scoring of these items by the instructor.

Learning Outcome 5: Students will understand the basic operation and analysis of simple digital logic.

Performance Objectives and Method of Measurement: Students will apply basic digital logic principles to solve homework and exam problems involving combinational and sequential logic, signal conditioning, and analog-to-digital circuits. The accuracy and completeness of their work will be measured by the evaluation and scoring of these items by the instructor.

Textbook: "Foundation of Electrical Engineering"

J.R Cogdell
Prentice hall

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

Homework and Quizzes: **10%**

First Mid-term Exam: **25%**

Second Mid-term Exam: **25%**

Final Exam: **40%**

Grading Scales from Exams:

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%

Exams Dates:

First midterm: Week of February 19

Second midterm: Week of March 28.

Final exam: 8 May (Tu): 12:00-15:00.

Attendance: Unexcused absences in excess of 3 will automatically result in a lowered grade and even in automatic failure in the course.

Course Outline:

Week	Topic
Wednesday 10	First Day of Classes
1	Electrical charge and Electrical Energy: <ul style="list-style-type: none"> - Physical basis of circuit theory - Current and Voltage Kirchhoff's laws - Energy flow in Electrical circuits
2	DC Circuits Analysis <ul style="list-style-type: none"> - Ohm's law - Series and Parallel resistors - Superposition theorem - Voltage and Current dividers -
3	DC Circuits Analysis <ul style="list-style-type: none"> - Thevenin's and Norton's equivalent Circuits - Source transformations - Node-voltage analysis - Loop-Current Analysis
4	Dynamics of Circuits: <ul style="list-style-type: none"> - Theory of Inductors and Capacitors - First order response of RL and RC Circuits - Advanced Techniques
5 & 6	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
7 & 8	Power in AC Circuits <ul style="list-style-type: none"> - AC Power and Energy Storage: Time Domain - Power and Energy: Frequency Domain - Transformer
9 & 10	Introduction to Electronics <ul style="list-style-type: none"> - The pn junction diode - Rectifiers and power supplies - Bipolar junction transistors - Transistor applications - Field effect transistors
11 & 12	Digital and Analog Electronics Digital: <ul style="list-style-type: none"> - Digital information - Electronic and digital signals - Mathematics of digital electronics - Combinational digital systems - Sequential digital systems Analog: <ul style="list-style-type: none"> - Frequency domain - Electrical Filters - Feedback concept - Op-amps circuits
13	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 Multiplertherapy 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	---