



SAINT LOUIS UNIVERSITY  
MADRID

**PHYS-1630-M01 ENGINEERING PHYSICS II**  
Fall 2017

**Class Days and Time:** TR, 09:30-10:45 a.m.

**Classroom:** PAH-20

**Prerequisite(s):** PHYS-1610 Engineering Physics I, PHYS-1620 Engineering Physics I Lab. Must enroll also in a PHYS-1640 Engineering Physics II lab section.

**Credit(s):** 3

**Instructor:** Francisco Prieto

**Instructor's Email:** francisco.prieto@slu.edu

**Instructor's Campus Phone:** 91 554 58 58, ext. 250

**Office:** PAH-203

**Office Hours:** MW, 11:00 a.m.-12:00 p.m.

**Course Description:**

The main objectives of this second introductory physics course are twofold: to provide the student with a clear and logical presentation of the basic concepts and principles of physics, and to strengthen an understanding of the concepts and principles through a broad range of interesting applications to the real world. This course is appropriate for all students majoring in engineering. The topics covered are: Calculus and vector approaches to study of electric charges, forces fields and potentials; electric current; magnetic forces and fields; electromagnetic waves; light and geometrical optics.

**Course Goals and Student Learning Outcomes:**

**Engineering Program Objectives**

- A. Students will understand the principles of physics and apply these principles to problems of fundamental and practical interest.
- B. Students will design and conduct experiments and analyze and interpret data.
- C. Students will collaborate effectively on teams.
- D. Students will communicate effectively and professionally in oral and written formats.
- E. Students know about contemporary issues in science and technology.
- F. Students will understand the numerical formulation of scientific problems and be able to solve such problems utilizing at least one programming language or environment.

**Student Learning Outcomes**

Program Objectives	Student Learning Outcomes	Assessment Method
A	A.1. Apply Coulomb's law and Gauss' law to calculate the electric field of a charge distribution. A.2. Calculate the effect of the electric field on a charge distribution. A.3. Calculate the electric potential of a charge distribution. A.4. Relate the equipotential surfaces to the electric field lines of a charge distribution.	Mid-term and Final Exam - Conceptual questions - Problems

	A.5. Calculate the capacitance of a capacitor or combination of capacitors. A.6. Apply Kirchoff's laws to simple electric circuits consisting of resistors, capacitors and DC sources. A.7. Calculate the magnetic force due to a magnetic field on a moving charge and on a current. A.8. Apply Biot-Savart law to calculate the magnetic field generated by a current. A.9. Apply Faraday's law. A.10. Explain Maxwell's equations and the basic features of electromagnetic waves. A.11. Solve problems in geometrical optics. A.12. Represent graphically a physical system using the free-body diagram technique. A.13. Identify the essential aspects of a problem, connect it to related areas of physics, formulate a strategy for solving the problem, apply appropriate techniques to arrive at a solution, test the correctness of the solution, and interpret the result. A.14. Show strong mathematical skills.	Brief Electricity and Magnetism Assessment (BEMA) Test
<b>B</b>	B.1. Analyze and interpret physics data represented graphically.	Mid-term and Final Exam - Conceptual questions
<b>D</b>	D.1. Communicate clearly and effectively the solution of a problem.	Mid-term and Final Exam - Problems

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.

#### Required Texts and Materials:

Bauer, W. and G. Westfall, *University Physics with Modern Physics*, McGraw-Hill, New York, 2011

#### Other References:

- D. Halliday, R. Resnick, J. Walker, *Principles of Physics. Vol. II*, 9th. Ed., John Wiley & Sons, 2011.
- Practical physics, 2 texts / Squires (530.078 SQU)
- Physlet Physics, W. Christian, M. Belloni (530.0785 CHR)

#### Attendance Policy:

- **It is mandatory to attend all classes unless a reasonable excuse is given.** *Any unexcused absences in excess of 3 will result in a lowered grade and even in automatic failure in the course.*
- **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.
- Useful information of the course can be found in Blackboard: <https://myslu.slu.edu>

**Course Requirements and Grading Rationale/System:**

The grade will be obtained from the following areas:

Homework/Participation: **10 %**

Reading quizzes: **5%**

Quizzes: **10 %**

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

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

Final Exam: **25 %**

**Grading Scales**

100 < A < 90%,

89% < A- < 87%

86% < B+ < 84%

83% < B < 80%

79% < B- < 77%

76% < C+ < 74%

73% < C < 70%

69% < C- < 66%

65% < D < 60%

F < 60%

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

**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.

**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 Multiplettherapy Institute, the off-campus provider of counseling services for SLU-Madrid ([www.sinews.es](http://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](mailto: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 (tentative):**

Class date	Topic	Read Sections	Due date
Sept. 5	Introduction / <i>BEMA test</i>		
Sept. 7	Electric charge	21.1–6	Sept. 7
Sept. 12	Electric charge		
Sept. 14	Electric field	22.1–6	Sept. 12
Sept. 17	<a href="#">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</a>		
Sept. 19	Electric field. <i>Problems</i>		
Sept. 21	<i>Problems</i> . Gauss' law	22.7–9	Sept. 21
Sept. 26	Gauss' Law		
Sept. 28	Gauss' Law. Electric Potential	23.1–2;23.6	Sept. 28
Oct. 3	Electric Potential	23.3–23.4-5	Oct. 3
Oct. 5	<i>Review</i>		
Oct. 10	<b>First Mid Term Exam</b>		
Oct. 12	<b>Holiday</b>		
Oct. 17	Capacitance	24.1-7	Oct. 17
Oct. 19	Capacitance	24.8-9	Oct. 19
Oct. 24	<i>Problems</i> . DC Circuits		
Oct. 26	DC Circuits	25.1-8	Oct. 26
Oct. 30	<a href="#">Last Day to Drop a Class and Receive the Grade of W.</a>		
Oct. 31	DC Circuits. <i>Problems</i>	26.1-5	Oct. 31
Nov. 2	The magnetic field	27.1-7	Nov. 2
Nov. 2	<a href="#">Spring Registration Opens!</a>		
Nov. 7	Ampere's law <b>Science Week (12:00-1:00 pm)</b>	28.1-7	Nov. 7
Nov. 9	<b>Holiday</b>		
Nov. 14	Ampere's law		

Nov. 16	<i>Problems</i>		
Nov. 21	<b>Second Mid Term Exam</b>		
Nov. 23	Faraday's law	29.1-3	Nov. 23
Nov. 28	Faraday's law	29.4-5	
Nov. 30	Inductance	29.6-10	Nov. 30
Dec. 5	Maxwell's equations	31.1-3	Dec. 5
Dec. 7	AC Circuits	30.1-8	
Dec. 12	<i>Review / BEMA test</i>		
Dec. 19	<b>Final Exam (08:30 a.m.)</b>		

FALL 2017 FINAL EXAM SCHEDULE

	<b>14 Dec (Th)</b>	<b>15 Dec (Fr)</b>	<b>18 Dec (Mn)</b>	<b>19 Dec (Tu)</b>	<b>20 Dec (Wd)</b>
<b>08:30-11:30</b>	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 & 10:00	Tu classes that meet at 8:00
<b>12:00-15:00</b>	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
<b>15:30-18:30</b>	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
<b>19:00-22:00</b>	---	---	Mn classes that meet at 19:00	Tu classes that meet at 19:00	---