



SAINT LOUIS UNIVERSITY
MADRID

PHYS 1610 M01: Engineering Physics I
Spring 2018

Class Days and Time: MWF, 12:00-12:50

Classroom: PAH-24

Prerequisite(s): MATH-1510 Calculus I. Must enroll also in a PHYS-1620 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: F, 10:00-12:00

Course Description:

Calculus and vector approaches to study of kinematics, statics and dynamics; work and energy; impulse and momentum; circular motion and gravity; rotational motion and equilibrium; vibrations, waves and sound; heat; fluid mechanics; elasticity.

Course Goals and Student Learning Outcomes:

The main objective of this first introductory physics course is to provide the student with a clear and logical presentation of the basic concepts and principles of mechanics. This course is appropriate for all students majoring in engineering. The outcomes of this course are described below.

At the end of the course, students will:

Engineering Program Objectives

- A. An ability to apply knowledge of mathematics, science, and engineering.
- B. An ability to design and conduct experiments, as well as to analyze and interpret data.
- C. An ability to design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability.
- D. An ability to function on multidisciplinary teams.
- E. An ability to identify, formulate, and solve engineering problems.
- F. An understanding of professional and ethical responsibility.
- G. An ability to communicate effectively.
- H. The broad education necessary to understand the impact of engineering solutions in a global, economic, environmental, and societal context.
- I. A recognition of the need for, and an ability to engage in life-long learning.
- J. A knowledge of contemporary issues.
- K. An ability to use the techniques, skills, and modern engineering tools necessary for engineering practice.

Student Learning Outcomes

Program Objectives	Student Learning Outcomes
A	A.1. Apply other coordinate systems: normal-tangential. A.2. Apply the kinematics equations of translational motion of a single particle in one and two dimensions. A.3. Apply the kinematic equations of rotational motion of a rigid body A.4. Apply Newton's laws of motion to solve problems on translational motion of a particle. A.5. Apply the fundamental laws of rotational motion to solve problems on rotational motion of a rigid body. A.6. Apply the equations of static and dynamic equilibrium of a particle and a rigid body. A.7. Apply the Work-Energy Theorem to the translational and rotational motion. A.8. Apply the Principle of Linear/Angular momentum and Linear/Angular impulse. A.9. Calculate the center of mass of a many-particle system and of a rigid body. A.10. Calculate the moment of inertia of a rigid body. A.11. Apply law of conservation of momentum to solve problems on collisions. A.12. Solve problems on the elastic properties of materials. A.13. Solve the problems on static fluids. A.14. Describe the oscillatory motion. A.15. Describe Simple Harmonic Motion qualitatively and quantitatively.
B	B.1. Analyze and interpret physics data represented graphically.
E	E.1. Represent graphically a physical system using the free-body diagram technique. E.2. 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. E.3. Show strong mathematical skills.
G	G.1. Communicate clearly and effectively the solution of a problem.
K	K.1. Use Matlab to solve physics 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. I*, 9th. Ed., John Wiley & Sons, 2011.

Problems in physics / V. Zubov (530.076 ZUB)

Practical physics, 2 texts / Squires (530.078 SQU)

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:

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

Homework and participation: **10 %**

Reading quizzes: **5%**

Quizzes: **10 %**

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

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

Final Exam: **25 %**

Grading Scales:

90% ≤ A ≤ 100%

87% ≤ A- < 90%

84% ≤ B+ < 87%

80% ≤ B < 84%

77% ≤ B- < 80%

74% ≤ C+ < 77%

70% ≤ C < 74%

66% ≤ C- < 69%

60% ≤ D < 66%

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 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 <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.

Spring 2018 Course Schedule:

Class date	Topic	Read Sections	Due date
Jan. 10	Presentation		
Jan. 12	Measurement	1.1-1.5	Jan. 12
Jan. 15	Motion in one dimension	1.6; 2.1-2.8	Jan. 15
Jan. 17	Vectors		
Jan. 19	Motion in two dimensions	3.1-3.6	Jan. 19
Jan. 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		
Jan. 22	Motion in two dimensions		
Jan. 24	Problems		
Jan. 26	Holiday		
Jan. 29	Force and Newton's law	4.1-4.6	Jan. 29
Jan. 31	Applications of Newton's law	4.7-4.8	Jan. 31
Feb. 2	Applications of Newton's law		
Feb. 5	Applications of Newton's law	9.5; 9.7	Feb. 5
Feb. 7	Applications of Newton's law		
Feb. 9	<i>Problems</i>		
Feb. 12	<i>Review</i>		
Feb. 14	First Mid Term Exam	Registration for Summer 2018 Begins	
Feb. 16	Work and energy	5.1-5.7	Feb. 16
Feb. 19	Work and energy	6.1-6.8	Feb. 19
Feb. 21	Work and energy		
Feb. 23	Holiday		
Feb. 26	<i>Problems</i>		
Feb. 27	Professors' Deadline to Submit Midterm Grades		
Feb. 28	Systems of particles		
March 2	Systems of particles		
March 5	<i>Problems</i>		
March 7	Momentum and collisions	7.1-7.8	March 7
March 9	Momentum and collisions	Last Day to Drop a Class and Receive a Grade of W	
March 12	Momentum and collisions		
March 14	<i>Review</i>		
March 15	Last Day to Submit Transfer Application for Fall Semester		
March 16	Second Mid Term Exam		
March 19	Rotational kinematics	9.1-9.7	March 19
March 21	Rotational dynamics	10.1-10.3; 11.1-11.3	March 21
March 23	Rotational dynamics		
March 26	Holiday		
March 28	Holiday		
March 30	Holiday		
April 2	Rotational dynamics	10.4-10.6	April 2
April 4	Rotational dynamics	Registration for Fall 2018 Semester Begins	

April 6	<i>Problems</i>		
April 9	Angular momentum	10.7-10.9	April 9
April 11	<i>Problems</i>		
April 13	Gravitation	12.1-4	
April 16	Gravitation		
April 18	<i>Problems</i>		
April 20	Oscillations		
April 23	Oscillations		
April 25	<i>Problems</i>		
April 27	<i>Review</i>		
April 30	FCI test		
May 2	Holiday		
May 9	Final Exam (12:00 pm)		
May 11	University Housing Move-out Date		
May 12	Commencement		
May 13	Professors' deadline to submit spring 2018 final grades		

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	---