

Physics 105, 2009 Spring Analytical Mechanics

Instructor	Mari-Anne M. Rosario
Contact info	Galileo 108A, 925-631-4837, mrosario@stmarys-ca.edu
Office hours	tentatively W 2-3:30, Th 11-12:30, and by appointment I am also usually around MWTh afternoons
Meetings	MWF 11:30-12:30
Text	Classical Dynamics of Particles and Systems, 5th ed Thornton and Marion (Brooks Cole 2004)
Website	physics.stmarys-ca.edu has updated course information

Course description and goals

This course covers the principles of particle dynamics. Topics include rigid body dynamics, Lagrange's equations, Hamilton's principle, wave propagation, and normal modes of vibration in oscillating systems. Prerequisites: Physics 3 and Math 29.

This course is an opportunity to gain (1) an intermediate level understanding of classical mechanics, (2) further experience with mathematical techniques used in science and engineering, and (3) confidence in your problem solving skills and in using previously learned material.

Evaluation

The final grade will be based on

Problem sets	35%
Project	10%
In-class exams	30%
Final exam	25%

Problems will be assigned each class meeting. These problems are an opportunity for you to evaluate your understanding of the material and to develop problem solving and math skills. The two lowest problem set scores will not be considered in your final grade. Late submissions will be accepted up to a week after the due date, but points will be deducted. It is important to **do all the problems in a timely manner**.

A computational project on a problem in mechanics will be due. Project results are to be presented in a written report and a formal in-class talk.

Two in-class exams will be given. Exams will focus on recently covered material, but will assume an understanding of previously covered material. A final exam will be given during finals week. The exam will be comprehensive, but will emphasize material from the latter part of the course.

Grading and Academic honor code

Present clear and complete solutions. In addition to calculations, include text or sketches to briefly explain assumptions and justify steps. A correct answer with no justification will earn no credit; an incorrect answer with correct justification will earn partial credit. If you believe that there has been an error in grading, request a regrade. The original, unaltered work must be resubmitted within one week, accompanied by a written explanation of what I should consider when regrading.

This course operates under the premises of the SMC academic honor code. It is expected that everyone will work to uphold high standards of integrity. You are encouraged to work on and discuss

the assignments with others, but cite co-workers and references. Although your methods may be similar to your coworker's, **there is no acceptable reason for your work to look exactly like someone else's**. See the *Student Handbook* for further information on the honor code.

Attendance and schedule

Attendance is not required, but it is highly recommended. Participation is welcome, so ask questions, provide responses, and add comments.

Each student is responsible for all information given during lecture and for submitting assignments on time, regardless of whether or not they are present in class. This applies even if an absence is due to some acceptable reason. Conflict or make-up exams will be given only if the student (1) provides an acceptable and documented excuse and (2) contacts the instructor before the exam.

The tentative schedule for this class is as follows:

week	chapter	topics and notes
02/09	2	Equations of motion
02/16	3	Simple harmonic oscillator
02/23	3	Damped and driven oscillators
03/02	5	Gravitation
03/09	5	Gravitational potential
03/16	6	Calculus of variations, Exam 1
03/23	7	Hamilton's principle
03/30	7	Lagrange's equations
04/06		Spring Break
04/13	7	Canonical equations of motion
04/20	8	Central forces, Exam 2
04/27	8	Orbits
05/04	10	Motion in a non-inertial reference frame
05/11		Project presentations
Finals		Final Exam: Wednesday 11:30-1:30

Student disability services

Reasonable and appropriate accommodations, that take into account the context of the course and its essential elements, for individuals with qualifying disabilities, are extended through the office of Student Disability Services. Students with disabilities are encouraged to contact the Student Disability Services Coordinator at (925) 631-4164 to set up a confidential appointment to discuss accommodation guidelines and available services. Additional information regarding the services available may be found at the following address on the Saint Marys website:
www.stmarys-ca.edu/academics/academic-advising-and-achievement/student-disability-services.html