SYLLABUS

MECHANICS I

fall semester 2022

https://www.phys.uconn.edu/~rozman/Courses/P3101_22F/

Last modified: August 25, 2022

Course description: Physics 3101 Mechanics I covers the following topics: Newton's Laws of motion applied to mass points, systems of particles, and rigid bodies.

The course is a theoretical treatment of classical mechanics, useful in its own right for treating complex dynamical problems, as well as essential to understanding the foundations of quantum mechanics and statistical physics.

Lectures:

Tu 5:00 pm – 6:15 pm, Gant Plaza 116, Th 5:00 pm – 6:15 pm, Gant Plaza 107

Course webpage: https://www.phys.uconn.edu/~rozman/Courses/P3101_22F/

Instructor: Michael Rozman

email: michael.rozman@uconn.edu office hours: Tu 6:15 pm – 7:15 pm in Gant Plaza 116, Th 6:15 pm – 7:15 pm in Gant Plaza 107, and by appointments

- **Recommended textbooks:** David Morin, *Introduction to Classical Mechanics With Problems and Solutions*, Cambridge University Press, 2008; David Morin, *Problems and Solutions in Introductory Mechanics*, CreateSpace Independent Publishing Platform, 2014.
- **Exams:** three midterm exams, no final. Parts of the exams may be substituted by takehome projects.

Class schedule: this is a *preliminary* schedule.

Week(s)	Subject	
1	Strategies for solving problems; dimensional analysis; approximations.	
2	Newton's laws of motion	
3-4	Problems in particle dynamics	
5	Oscillations	
	Midterm I, Thu, Sep 29	
6-7	Conservation laws	
8-10	Lagrangian mechanics	
	Midterm II, Thu, Nov 3	
11	Central forces	
12	Dynamics of rigid bodies	
13	Thanksgiving recess	
14	Accelerating reference frames	
15	Hamiltonian mechanics	
	Midterm III, Thu, Dec 8	

Grading scheme:

The course grade will be calculated using the following scheme.

Homework assignments	40%
3 Midterms	60%

Course grade = 0.4*HW + 0.2*(M1 + M2 + M3), correctly rounded to integers and capped at 100%.

The rounding to integers is done using the default rounding mode specified in the IEEE754 standard for floating point arithmetic.

Percent grade	Letter grade
94+	А
90-93	A-
87-89	B+
83-86	В
80-82	B-
77-79	C+
73-76	С
70-72	C-

The percent grades are converted to the letter grades as follows.

- **Communications:** talking in person is the preferred method to communicate with the instructor; email is an option to schedule an appointment or to ask/answer a very short question.
 - use your UConn email address for class communications.
 - please include the tag "[phys 3101]" (without quotes) in the subject of your email, e.g. "[phys 3101] midterm II review session".
 - the subject line of your email should communicate exactly what the email is about so that the recipient can prioritize the email's importance without opening it. E.g. "[phys 3101] Tacoma bridge collapsed cannot come to the final" would be a good email subject (assuming email existed in 1940 ...); "urgent", "important", "a question" are bad ones. Do not use your name as subject the sender name is already visible as a part of email header.
 - do not send instructor emails with attachments or embedded graphics.
 - do not include commercial advertising into your course-related emails.

Homework: you are welcome to discuss the homework assignments with others in order to better understand the problems but the work you turn in must be your own. In particular, you must run your own calculations (where applicable) and communicate and explain the results in your own words.

Homework assignments are not accepted after the solutions had been discussed in class, and/or had been posted online, and/or graded assignments returned. Individual emergencies can be accommodated by extra credit assignments.

Members of collaborating groups must consistently list all collaborators names and submit assignments together.

Homework assignments submitted on time may be returned (at the discretion of the instructor) for corrections after initial grading.

Assignments that are hard to understand are also hard to grade correctly, therefore: (a) use words and pictures to supplement your equations; (b) work must progress linearly down the page – recopy solutions that are too nonlinear.

Requirements for written assignments:

- Use letter-size paper. Use only one side of each sheet.
- Box your final answer(s) and important intermediate results.
- Staple your notes together, (i.e. no paper clips, torn or folded corners) with the assignment cover page.
- **Honors conversion:** students interested in honors conversion should contact the instructor during the *second* week of classes.
- **Student responsibilities and academic policies:** students at the University of Connecticut are held to certain standards and academic policies. Review these standards and policies the links are provided on the course website.