SYLLABUS

MECHANICS II

SPRING SEMESTER 2020

http://www.phys.uconn.edu/~rozman/Courses/P3102_20S/

Last modified: March 23, 2020

Course Description: Physics 3102 *Mechanics II* primarily discusses physics of continuous media.

Continuum physics describes the macroscopic physical world around us. Whereas a course of classical (analytical) mechanics is a standard part of physicists' education, physics of continuous media is a course much harder to come by. The enormous progress of quantum physics has almost eliminated macroscopic phenomena from the physics curriculum. Nonetheless, research in engineering, materials science, and biology demands increased mastery of classical physics.

The course aims to offer a modern, unified introduction to the basic concepts and phenomenology of continuous macroscopic systems. Emphasis is placed equally on intuition and formalism with examples from geophysics, astrophysics, and engineering among other fields.

The course is intended for physics, biology, applied mathematics, chemistry, and engineering advanced undergraduate students. The mathematical prerequisites are modest and are developed further as the need arises.

Prerequisites: A basic background in calculus, ordinary differential equations, and Newtonian mechanics.

Lectures: MoWe 5:00PM – 6:15PM, ~~GS-119~~, online live lectures

Course webpage: http://www.phys.uconn.edu/~rozman/Courses/P3102_20S/

Instructor: Michael Rozman

email: michael.rozman@uconn.edu
office hours: Mo 6:15 PM – 7:15 PM ~~in GS-119~~, online,
We 6:15 PM – 7:15 PM ~~in GS-119~~, online, and by appointment

Textbook: not required but highly recommended: B. Lautrup, *Physics of Continuous Matter, Exotic and Everyday Phenomena in the Macroscopic World* , CRC Press 2011

Handouts from the textbook will be provided.

Exams: Three midterm exams, no final. Parts of the exams may be substituted by take-home projects.

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 percent grades are converted to the letter grades as following.

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

Class schedule: this is a *preliminary* schedule.

Week(s)	Subject
1	Stress
2	Strain
3	Hooke's law
4-6	Elastostatics. Slender rods
	Midterm I - Wed, Feb 26
7-8	Continuum dynamics
9	**Spring recess**
10	Ideal flow
	Midterm II - Wed, Mar 25
11-12	Viscosity
13	Gravity waves
14	Subsonic flights
15	Turbulence
	Midterm III - Mon, Apr 27

Honors conversion:

Students interested in honors conversion should contact the instructor during the *second* week of classes.

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

~~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.~~

You are welcome to discuss the homework's problems with others in order to better understand them 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.

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

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 (if applicable).

~~Highly recommended: make copies of homework assignments for your own files.~~

Communications: talking in person is the preferred method to contact the instructor; email is the a good option to schedule ~~an~~ a video appointment.

- use your UConn email address for class communications.
- please include the tag ``[phys3102]'' (without quotes) in the subject of your email, e.g. "[phys3102] 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. "[phys3102] 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. (For the same reason do not repeat your name at the beginning of your email.)
- ~~please no emails with attachments or embedded graphics unless requested by the instructor.~~