

Physics 104: Advanced Mechanics

Summer B 2019

Instructor: Eric Jones
E-mail: ewj@physics.ucsb.edu

Time: MTW 9:30am-10:50am
Location: North Hall 1111

Course Website: On Gauchospace
Office Hours: 11am-noon W and 1-2pm F

Office Location: Broida Hall 6302

Discussion Section Time: Thursday 9:30am-10:50am
Teaching Assistant (TA): Kaikai Liu

Location: Building 387, 1011

Textbook: John Taylor, [Classical Mechanics](#)
Supplemental reading: Herbert Goldstein, [Classical Mechanics](#)

Administrative Assistance: Jean Dill, *Undergraduate Advisor*, Broida 3019C
E-mail: ugradstaffadvisor@physics.ucsb.edu

Homework

Problem sets are posted Fridays on the course website. *Homework is due the following Friday 5:00pm in the Phys 104 box in Broida.* It will consist of some end-of-chapter problems in Taylor, and other self-contained problems from other sources. **Your solutions should be written neatly and explained thoroughly.** Late homework will receive at most 75% of full credit, and will **only be accepted if permission is granted by email.** Graded homework will be returned in class the next Wednesday.

Discussion sections

Discussion sections will involve both TA-led practice problems, and student-led (groups of 3-4 students) discussion of concepts from lecture. Part of your course grade will be determined by your participation in discussion sections.

Exams and Important Dates

Midterm Exam: Aug 20 9:30-10:50pm, Tuesday, North Hall 1111

Final Exam: Sep 13 4-7pm, Friday, North Hall 1105

Last day to drop class: Aug 20, Tuesday

Last day to add class: Aug 16, Friday

Last day to change grading to P/NP: Sep 3, Tuesday

Start of discussion sections: Aug 8, Thursday

Grading Scheme

Homework	30%
Midterm	25%
Final	40%
Discussion Participation	5%
<i>Extra credit:</i> Essay on a chapter in Taylor (Ch. 12 or 16), details TBD	5%

Grading Scale (pre-curve)

A+	97 – 100	C+	76 – 78
A	90 – 97	C	70 – 76
A-	88 – 90	C-	68 – 70
B+	86 – 88	D+	66 – 68
B	80 – 86	D	60 – 66
B-	78 – 80	D-	58 – 60
		F	< 58

Tentative course outline

Date	Topic	Reading Assignment
Mon 8/5	Constraints and d'Alembert principle	Taylor Ch 7.1-7.4
Tues 8/6	Lagrange Mechanics	Taylor Ch 7.5-7.7
Wed 8/7	Calculus of variation	Taylor Ch 6.1-6.4
Mon 8/12 - Wed 8/14	Non-inertial reference frames	Taylor Ch 9.1-9.10
Mon 8/19	Review	
Tues 8/20	Midterm	
Wed 8/21 - Tues 8/27	Rigid body rotation	Taylor Ch 10.1-10.9
Wed 8/28 - Tues 9/3	Coupled oscillators	Taylor Ch 11.1-11.7
Wed 9/4 - Tues 9/10	Hamilton mechanics	Taylor Ch 13.1-13.7
Wed 9/11	Review	
TBD	Final Exam	

How to do well

If you did not take Phys 103 recently, you should review the material from that course. To be best prepared, read chapters 1 – 5, and 8 of the textbook Classical Mechanics by John Taylor.

Taylor will be used as the main textbook. However in some cases, to give you a broader overview and enhance your understanding, we may use a different approach. In lectures, we will go through the key ideas underlying new concepts of classical mechanics. We will also demonstrate the application of these concepts in form of examples. However, to further deepen your understanding it will be good to work through many problems. **Work and discuss these concepts and problems with your classmates. Study groups are encouraged.** It is important to carefully work through example problems on your own as well as in discussion with classmates. The homework and discussion sessions will help with that, but you should do more problems and have additional discussions. It is helpful to review the notes you have taken in lecture, and write out your own notes, explaining the material to yourself. Note sheets will be allowed for exams, so make sure to prepare them while you're working through the material and problems. Do not hesitate to seek help. Attend the discussion sections, and get involved.