# Physics

7A:

# Introduction to

Classical

# Mechanics

Winter 2024

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| **Instructor:** | Georgios Koutroulakis | **Time:** T, R @ 9:30am – 10:45am |
| **Email:** | [gkoutrou@ucsb.edu](mailto:gkoutrou@ucsb.edu) | **Place:** [Broida Hall 1610](https://maps.app.goo.gl/6wx8hBqBPtt7wUQN8) |

**Course Website:** <https://ucsb.instructure.com/courses/17546>

**Discussion Forum:** On Canvas’ [*Discussions*](https://ucsb.instructure.com/courses/17546/discussion_topics)

**Help Sessions (Office Hours):** Tuesday/Thursday 2-3pm, Friday 1-2pm (in-person and on zoom), or by appointment. Separate online 15-min slots will be available to reserve on Canvas Mondays,Wedensdays.

**Office Location:** Broida Hall 1409

**Administrative Assistance: Nohely Vargas/Earnest Cooper Jr.**, *Undergraduate Advisors*, Broida 3019C Email: [physics-advisers@ucsb.edu](mailto:physics-advisers@ucsb.edu)

## Teaching Assistants:

* **Moira Andrews**, [moira andrews@ucsb.edu](mailto:moira_andrews@ucsb.edu). **Office Hours:** TBD, in Broida 1019
* **Jacob Lyons**, [jacoblyons@ucsb.edu](mailto:jacoblyons@ucsb.edu). **Office Hours:** TBD, in Broida 1019
* **Divyoj Singh**, [divyoj@ucsb.edu](mailto:divyoj@ucsb.edu). **Office Hours:** TBD, in Broida 1019

**Textbook:** Young and Freedman, [*University Physics*, 15th edition (with MasteringPhysics)](https://www.pearson.com/en-us/subject-catalog/p/university-physics-with-modern-physics/P200000006855/9780136874331),

*Reading schedule will be posted at the beginning of each week.*

**MasteringPhysics Course ID: koutroulakis35619** (registration instructions [here](https://ucsb.instructure.com/courses/17546/files/2061822?module_item_id=1045739))

**Lecture vs. Discussion:** The main goal of the *lectures* is to introduce the new concepts and help you fully grasp their essence and consequences, as applied in the physical world. But, of course, at some point the conceptual understanding should manifest in solving actual problems. We will try to show and solve many problems during *lecture*, but, **it is precisely the role of the *discussion sections* to extensively present examples and solution of representative problems**, in order to ensure that you can translate conceptual understanding into problem solving. For this reason, **it is instrumental for your learning experience and your success in the course that you attend and actively participate in the *discussion sections***. When you have questions, take advantage of the office hours!

**Assignments: Homework Sets** will be weekly and will be due about one week after posted. They will consist of two components, each with equal weight towards your final score (7% each): A number of online tutorials and exercises from [MasteringPhysics](https://www.pearson.com/mastering) (ID: koutroulakis35619); and end-of-chapter problems which you’ll have to solve by hand (on paper or tablet) and submit an electronic copy (scan or picture) on Canvas. The latter won’t be graded, you’ll receive full credit upon on-time submission. There will also be **Pre-lecture Assignments**, posted on MasteringPhysics at least 24 hours before each lecture. They should take about 5-15min and they will count towards a total 6% of your final score. **Practice problem solving by meticulously working on your homework**. That’s the best way to truly digest the course material!

**Lecture Participation:** *iClicker Cloud* will be used in order to ask/answer relevant multiple choice questions during most of our lectures. You will receive credit based on participation and not performance. Specifically, up to 5% credit will be counted towards your final score proportionally to your participation. *iClicker Cloud* is free to use with your phone/tablet/computer, or you can use a clicker remote, if you have one. Instructions on how to set up your account and register for our course can be found [here](https://www.iclicker.com/iclicker-canvas-integration/).

Physics 7A: Introduction to Classical Mechanics January 5, 2024

## Exams and Important Dates:

Discussion Sections begin January 11, Thursday

Last day to drop class February 2, Friday

Midterm Exam (during lecture) February 6, Tuesday

Last day to change grading to P/NP March 15, Friday

Final Exam March 19, Tuesday, 8:00am – 11:00am

The midterm exam will take place during class time. All exams will be closed book The questions and prob- lems will test your ability to apply concepts covered in lecture, and homework assignments, with about 30% conceptual questions and about 70% analytical problems. [Gradescope](https://www.gradescope.com/) will be used for exam grading.

**Grading Scheme:**

Lecture Participation 5%

Discussion Participation 7%

Pre-lecture Assignments 6%

Weekly Homework 14%

Midterm Exams (two) 26%

Final Exam 42%

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| **Grading Scale:** |  | | | |
|  | 95-100 | A+ | 62.5 - 67.5 | C+ |
|  | 87.5 - 95 | A | 57.5 - 62.5 | C |
|  | 82.5 - 87.5 | A- | 52.5 - 57.5 | C- |
|  | 77.5 - 82.5 | B+ | 47.5 - 52.5 | D+ |
|  | 72.5 - 77.5 | B | 42.5 - 47.5 | D |
|  | 67.5 - 72.5 | B- | 37.5 - 42.5 | D- |
|  |  |  | *<*37.5 | F |
| **Course Outline (tentative):** |  |  |  |  |

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| Week | Chapter(s) | Topic(s) |
| 1, January 9 - 11 | 2 | Introduction, Motion in One Dimension |
| 2, January 16 - 18 | 3,4 | Projectiles, Force/Mass and Newton's Laws |
| 3, January 23 - 25 | 4,5 | Applying Newton's Laws |
| 4, Jan 30 - Feb 1 | 3.4, 5 | More Newton's Laws, Circular Motion |
| 5, February 6 - 8 | 6 | Work and Kinetic Energy |
|  | Midterm Exam: Tuesday, February 6 | |
| 6, February 13 - 15 | 7,8 | Conservation of Energy, Momentum |
| 7, February 20 - 22 | 8,9 | Collisions, Rotational Kinematics |
| 8, February 27 - 29 | 9,10 | Energy in Rotation, Torque |
| 9, March 5 - 7 | 10 | Angular Momentum and its Conservation |
| 10, March 12 - 14 | (parts of) 11 | Statics and Equilibirum |