

Physics Studio A: PHY2048C

Professor: Dr. Daniel Segal. Room 309. T/Th/F 9:30 – 12:00 Final Exam: T. 9:00-11:30

Office Hours: 2nd Floor, Faculty Wing, or Room 309. 12:15 – 12:45 pm. M to F.

Class webpage (lab guides, extra credit readings and homework are there): astrosega.github.io/teaching/

Course Description: An introduction to classical mechanics and thermodynamics for science and engineering majors, designed to be taken as a sequence with Physics Studio A and Intermediate Modern Physics. Calculus is used: differentiation heavily, integration and differential equations slightly. Calc. I is a prerequisite; any novel math will be covered in class. “Studio” means the class integrates lectures and labs into the same space and time. Every Friday there is either a lab, a quiz, or a homework is due.

Required Text: [University Physics 1 & 2](#) **Additional Text:** Fundamentals of Physics I by R. Shankar.

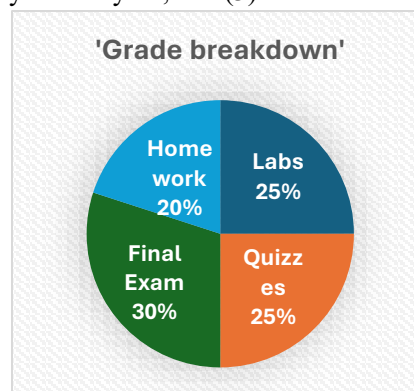
Required Lab Equipment: Some labs will use the free smartphone app phyphox. The lab guides specify which, but if you want to have the app ready to use, you can download it [here](#).

Additionally, a **composition notebook** is required, as lab reports will be handwritten and turned in individually via each student’s lab notebook. The notebooks are to be turned in at the end of the lab. Assigned **pre-labs** and the **lab guides** are found in the class [webpage](#).

Course Learning Objectives (including liberal studies learning objectives assigned to the course): In this course, engineering and science majors will (1) learn about the basic laws of motion in classical mechanics, (2) learn how and why objects in our day-to-day move (or stay put) the way that they do, and (3) will know how to predict projectile and rotational motion. They will also (4) learn about the nature of scientific laws and the statistical nature of scientific measurements.

Grading Assignments:

- Laboratory reports (25 %)
- Homework (20 %)
- Final Exam (30 %)
- Quizzes (25%)
- Extra Credit Readings (up to 80% of the Final Exam Credit)



Either (2) quizzes or two (2) homework are dropped for the final grade (or one of each). If a Laboratory is missed, the student must stay until the end of a class (the date to be scheduled with the instructor) to perform said lab. Quizzes will be 50 minutes long and recurrent (every two weeks on average). The Final exam is cumulative. If the Final Exam grade (without the extra credit) is higher than the final grade, then I will place the Final Exam grade as your grade for the class. The number to letter grade key is as follows:

| | | | |
|---------------|---------------|---------------|---------------|
| A (93 and up) | A- (90 to 93) | B+ (87 to 90) | B (83 to 87) |
| B- (80 to 83) | C+ (77 to 80) | C (73 to 77) | C- (70 to 73) |
| D (63 to 67) | D- (60 to 63) | F (below 60) | |

Extra Credit Readings: After reading, students must list **10 questions or uptakes** about the essay and submit them via Canvas **at any point before the final week of lectures**, and after the reading has been assigned. An [Oxford-style tutorial](#) will take place: these consist in discussing the student’s questions and uptakes about the reading during office hours, for 30 mins. Each reading+tutorial is worth 20% of the Final Exam’s grade.

LIBERAL STUDIES STATEMENT

This course has been approved to meet FSU's Liberal Studies Natural Sciences requirement and helps you become an effective interpreter of scientific results and a critical analyst of claims about the natural world. This course has a philosophy of science component that further reinforces critical thinking skills.

UNIVERSITY ATTENDANCE POLICY

Excused absences include documented illness, deaths in the family and other documented crises, call to active military duty or jury duty, religious holy days, and official University activities. These absences will be accommodated in a way that does not arbitrarily penalize students who have a valid excuse. Consideration will also be given to students whose dependent children experience serious illness.

ACADEMIC HONOR POLICY

The Florida State University Academic Honor Policy outlines the University's expectations for the integrity of students' academic work, the procedures for resolving alleged violations of those expectations, and the rights and responsibilities of students and faculty members throughout the process. Students are responsible for reading the Academic Honor Policy and for living up to their pledge to "...be honest and truthful and... [to] strive for personal and institutional integrity at Florida State University." (Florida State University Academic Honor Policy, found at <http://fda.fsu.edu/Academics/Academic-Honor-Policy>)

AMERICANS WITH DISABILITIES ACT

Florida State University (FSU) values diversity and inclusion; we are committed to a climate of mutual respect and full participation. Our goal is to create learning environments that are usable, equitable, inclusive, and welcoming. FSU is committed to providing reasonable accommodations for all individuals with disabilities in a manner that is consistent with academic standards of the course while empowering the student to meet integral requirements of the course.

ACADEMIC SUCCESS

Your academic success is a top priority for Florida State University. University resources to help you succeed include tutoring centers, computer labs, counseling and health services, and services for designated groups, such as veterans and students with disabilities. The following information is not exhaustive, so please check with your advisor or the Dean of Students office to learn more.

EMOTIONAL AND WELLNESS RESOURCES

FSU Panama believes firmly in the importance of mental health and has taken significant steps to support students. Dr. Maria Claudia Uribe, alumna and former professor of FSU, brings over two decades of experience as a psychotherapist and is here to enhance the well-being of our campus community. She will be offering on-site and online counseling, referrals, and additional resources upon request.



Dr. Uribe will be on campus during the first week of classes, and she will introduce herself. Her office will be room 301, which has been converted into a Wellness Room.

A telehealth service has also been added to our array of support tools, and more information about it will be provided by the Director of Student Affairs, Dr. Adam Tratner (atratner@fsu.edu), and Dr. Uribe (m.uribe@fsu.edu).

Finally, several Wellness Workshops are organized every semester. The Workshops cover important topics on mental and physical health, academic success, study habits and tools, and many others.

Tentative Schedule (see also the detailed schedule on the [webpage](#))

| Week | Tuesday | Thursday | Friday |
|------|---|--|--|
| 1 | Lecture: Motion in 1D (Ch 1 & 3) | No Classes | Quiz. Ch. 1, 3/ Lecture: motion in higher dimensions (Ch 2, 4) |
| 2 | Lecture: (Ch 2, 4) | Lecture (Ch 2, 4) | Lecture: Newton's laws (Ch 5) Lab 1: Measurements. |
| 3 | Lecture (Ch 5, 6) ECR assigned | Lecture (Ch 6) | Quiz (Ch 5)/ Lecture (Ch 6) |
| 4 | Lecture: Work (Ch 7) | Lecture: Conservation in 2D (Ch 8) | Lecture (Ch 8) |
| 5 | Lecture: Gravitation (Ch 13). ECR assigned | Lecture: Multiparticle Dynamics (Ch 9) | Quiz (Ch 13, 9 thus far). Lecture (Ch 9). Lab 2: Pendulum |
| 6 | Lecture (Ch 9) | Lecture: Rotation I (Ch 10) | Lecture (Ch 10) |
| 7 | Lecture: Rotation II (Ch 11) | Lecture (Ch 12) | Lecture: Rotation III (Ch 12) |
| 8 | Lecture (Ch 12) | Lecture (Ch 9) | Quiz (Ch 12)/Lecture : Math |
| 9 | Spring Break | | |
| 10 | Lecture: Simple Harmonic Motion (Ch 15) | Lecture (Ch 15) | Lecture (Ch 15) Lab 3: the definition of mass |
| 11 | Lecture (Ch 15) | Lecture: Waves (Ch 16) | Quiz (Ch 15)/Lecture (Ch 16) |
| 12 | Lecture (Ch 16) | Lecture: Fluids (Ch 14) | Lecture (Ch 14) Lab 4: Archimedes |
| 13 | Lecture: Sound Waves (Ch 17) | Lecture (Ch 17) | Quiz (Ch 14, 17)/Lecture (Ch 16) Lab 5: Speed of sound |
| 14 | Lecture: Heat (Ch 1b = Ch 1 from Volume 2) | Lecture (Ch 2b) | Lecture (Ch 2b) ECR assigned |
| 15 | Lecture (Ch 3b): Thermodynamics II | Lecture (Ch 3b) | No Class |
| 16 | Lecture (Ch 4b) : Entropy ECR assigned | Final Review | Final Review Lab 6: Thermal expansion |
| 17 | Final Exam 9:00 – 11:30 | | |

Legend: PSS = Problem-Solving Sessions, aka recitation. **ECR** = Extra credit reading is assigned.

I strive to provide a supportive learning environment for everyone, and it's always helpful for me to hear what works best for you. Have a great semester!



"The answers you seek, can be found in the syllabus."