

PHY2048C General Physics A (5 credits)

A. **Summer C 2025**

B. **Section 0002**

C. **Delivery Method:** In Person, Room 309. M./Tu. 9:30-11:30am W./Th. 9:30-12:00m

D. **Instructor Information**

Name: Daniel David Sega

Contact Information: dsega@fsu.edu

Office Hours: M/T/W/Th 12:20 - 1pm

Office Location: 1st Floor, Faculty Wing or Room 309

E. **Prerequisites or Co-requisites**

Prerequisite: MAC 2311

F. **Course Description**

This calculus-based course serves as the first in a two-part series, covering topics like kinematics, dynamics, energy, momentum, rotational motion, fluid dynamics, oscillatory motion, and waves. Designed for science and engineering majors, the course integrates critical thinking, analytical skills, and real-world applications.

G. **Course Objectives**

1. Students will solve analytical problems describing different types of motion, including translational, rotational, and simple harmonic motion.
2. Students will apply Newton's laws, and conservation laws to solve analytical problems of mechanics.
3. Students will identify and analyze relevant information presented in various formats such as graphs, tables, diagrams, and/or mathematical formulations.
4. Students will solve real-world problems using critical thinking skills and knowledge developed from this course.

H. **CoreFSU Syllabus Language**

This course has been approved to meet FSU's CoreFSU Natural Sciences requirement and helps you become an effective interpreter of scientific results and a critical analyst of claims about the natural world.

By the end of this course, students will:

1. Pose questions or hypotheses based on scientific principles.
2. Use appropriate scientific methods and evidence to evaluate claims or theoretical arguments about the natural world.
3. Analyze and interpret research results using appropriate methods.

As required by Florida State University, the student must earn a course grade of “C–” or higher in order to meet the CoreFSU 1-credit laboratory requirement.

I. Required Texts, Readings, and/or other Resources

[University Physics 1](#) | Fundamentals of Physics I by R. Shankar (Optional)

Personal Website (very helpful for the class): astrosega.github.io

J. Grading/Evaluation

The breakdown will be as follows:

- *Laboratory reports (25%)* (A scan of the lab notebook must be submitted via Canvas before the next class after the lab. Late penalty: 2 points p day)
- *Homework (15%)* (A scan must be submitted via canvas. Late penalty: 2 points p day)
- *Final Exam (30%)*
- *Quizzes (30%)*
- *Extra Credit Readings* (up to 60% of the Final Exam Credit)

One (1) quiz is dropped for the final grade. One (1) Laboratory is dropped. If a laboratory has been dropped and a subsequent laboratory is missed due to a valid circumstance, the student must stay after the end of a class (the date to be scheduled with the instructor) to perform said lab. If all possible quizzes have been dropped and a subsequent quiz is missed due to a valid circumstance, it will be made up on the day of the final exam. Quizzes will be 60 minutes long and recurrent (every two weeks on average). The Final exam is cumulative (it tests you on all the content of the course). The number to letter grade key is as follows:

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

Extra Credit Readings: After reading, students must list **10 questions or uptakes** about the essay and submit them via Canvas **before the due date** and after the reading has been assigned or write a mini (two page) essay. An [Oxford-style tutorial](#) will take place the following week (to be arranged by the student): 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.

K. Syllabus Change Policy

Except for changes that substantially affect implementation of the evaluation statement, this syllabus is a guide for the course and is subject to change with advance notice.

L. Class Recording Statement

In this class, consistent with state law and university policy, you may not make recordings of classroom activities without the permission of the instructor. This policy applies to both audio and video recordings.

M. University Policies and Syllabus Language

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. Check the Student Guide distributed at the Republic of Panama Campus for the list of local resources and support services.

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 illnesses.

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>); the Academic Honor Policy and the procedure for handling its violations at our campus can be found here: <https://panama.fsu.edu/overview/policies-and-information/academic-honor-policy>

The university does not include a specific policy on the use of AI technology, either to discourage or encourage it. If AI tools are used by students to generate responses to a graded assignment without explicit authorization or permission by the instructor, then this is considered a violation of the 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 persons 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.

To receive academic accommodations, a student should: (1) register with and provide documentation to the Office of Accessibility Services (OAS); and (2) request a letter from OAS

to be sent to the instructor indicating the need for accommodation and what type; and, (3) meet (in person, via phone, email, skype, zoom, etc...) with each instructor to whom a letter of accommodation was sent to review approved accommodations. Please note that instructors are not allowed to provide classroom accommodations to a student until appropriate verification from the Office of Accessibility Services has been provided. This syllabus and other class materials are available in an alternative format upon request. For the latest version of this statement and more information about services available to FSU students with disabilities, contact the:

Office of Accessibility Services

874 Traditions Way 108 Student Services Building Florida State University Tallahassee, FL 32306-4167 (850) 644-9566 (voice) (850) 644-8504 (TDD) oas@fsu.edu/
<https://dsst.fsu.edu/oas>

Tutoring & Academic Services at the Republic of Panama Campus

Writing Center at FSU Panama: Located in the FSU Panama Library (building 225). It offers drop-in consultations and appointments.

Reading Writing Center Online (through the main campus):
<https://wr.english.fsu.edu/Reading-Writing-Center/RWC-Online>

Math tutoring through the Math Learning Center at FSU Panama: student tutors provide support and preparation for exams. Drop-in hours are announced at the beginning of each semester.

Academic Center for Excellence (main campus): offers online tutoring and resources in several areas, as well as workshops on study tools and tips. <https://ace.fsu.edu/>

FSU Libraries. For all of your research needs, go to lib.fsu.edu. The Office of Distance Library Services will be of special support: <https://www.lib.fsu.edu/department/distance-learning>.

FSU Panama Library. Our library offers study space and copying/scanning capabilities.

Statement on Public Health Protocols

During any adverse event or condition that threatens our University community, the Republic of Panama Campus will utilize all of its communication channels to notify students, staff and faculty (email lists, alerts system, website updates). Please be patient with one another while we navigate any ongoing challenge. Whatever happens, we are committed to helping you learn the material thoroughly and stay on schedule with your degree program.

N. Course Schedule/Topical Outline

- *Mon., May 12: The Structure of Mechanics. Motion in 1D. (Chp. [1](#) & [3](#))*
Handout: [syllabus](#) [Homework 1](#) (Chp. 2 & 4) assigned, due Wed., May 21.

- *Tue., May 13: The Structure of Mechanics. Motion in 1D. (Chp. [1](#) & [3](#))*
- *Wed., May 14: Quiz Chp. 1 & 3 ([Practice](#)) | Vectors, motion in higher dimensions. (Chp. [2](#) & [4](#))*
- *Thu., May 15: Vectors, motion in higher dimensions, Reference Frames. (Chp. [2](#) & [4](#))*
- *Mon., May 19: Vectors, motion in higher dimensions, Reference Frames. (Chp. [2](#) & [4](#))*
- *Tue., May 20: Newton's Laws I (Chp. [5](#))*
- *Wed., May 21: Newton's Laws I (Chp. [5](#))*

<i>Homework 1</i>	<i>Homework 2 (Chp. 6 & 7 & 8) assigned, due</i>	<i>Extra credit reading: What is a Law</i>
<i>due.</i>	<i>Tue., Jun 9</i>	<i>Nature? OR The Mechanistic Universe , due Fri. May 29</i>

- *Thu., May 22: Newton's Laws II (Chp. [6](#))*
- *Mon., May 26: Problem-Solving Session | Newton's Laws II (Chp. [6](#))*

- Tue., May 27: Quiz Chp. 5 ([Practice](#) -> [Solved](#)) | Work (Chp. [7](#))
- Wed., May 28: Work | Conservation of Energy in 1D (Chp. [7](#), [8](#))

[Lab 1](#): Measurements and dimensions

- Thu., May 29: Work | Conservation of Energy in 2D (2.5 hr lecture) (Chp. [7](#), [8](#))
- Mon., June 2: Problem-Solving Session | Conservation of Energy in 2D (Chp. [8](#))
- Tue., June 3: Gravitation (Chp. [13](#))
- Wed., June 4: Quiz Chp. 8 ([Practice](#)) | (Chp. [13](#))

Homework 2
due.

Extra credit reading: [What is Space?](#) OR [What is Spacetime?](#), due
Fri., Mon 23

- Thu., June 5: Multiparticle Dynamics (Chp. [9](#))

[Lab 2](#):
measuring g (Pendulum)

[Homework 3](#) (Ch 10 & 11) assigned, due Tue., Jun
23.

- Mon., June 9: Multiparticle Dynamics (Chp. [9](#))
- Tue., June 10: Multiparticle Dynamics (Chp. [9](#))

[Lab 3](#): Collisions in 1-D

- Wed., June 11: Quiz Chp. 13 & 9 ([Practice](#) -> [Solved](#)) | Rotational Dynamics I (Chp. [10](#))
- Thu., June 12: Rotational Dynamics I (Chp. [11](#))
- Mon., June 16: Rotational Dynamics II (Chp. [11](#))
- Tue., June 17: Rotational Dynamics III (Chp. [12](#))

[Homework 4](#) (Math & Ch 12) assigned, due Tues., July 9.

- Wed., June 18: Rotational Dynamics III (Chp. [12](#))

Homework 3 due

- Thu., June 19: Problem-Solving Session | Rotational Dynamics III (Chp. [12](#))
- Mon., June 23: Quiz Chp. 12 ([Practice](#) -> [Solved](#)) | Mathematical methods intermission.

Handout: [Complex numbers](#)

- Tue., June 24: Rotational Dynamics II (Chp. [11](#)) and III (Chp. [12](#))
- Wed., June 25: Mathematical Methods | Simple Harmonic Motion (Ch. [15](#))
- Thu., June 26: Quiz Chp. 11 & 12 (round 2) ([Practice](#)) | Simple Harmonic Motion (Ch. [15](#))
- Mon., June 30: Simple Harmonic Motion (Ch. [15](#))

Handout: [notes](#) on damped harmonic motion

- Tue., July 1: Waves (Ch. [16](#))
- Wed., July 2: Waves (Ch. [16](#)).
- Thu., July 3: Quiz Chp. 15 ([Practice](#)-> [Solved](#)) | Waves (Ch. [16](#))

Homework 4 due.

[Homework 5](#) (Chp. 12 & 14) assigned, due Tues., July 22.

- Mon., July 7: Waves (Ch. [16](#))
- Tue., July 8: Waves and Fluid Statics (Ch. [14](#) & Ch. [16](#))
- Wed., July 9: Fluid Statics (Ch. [14](#))

Extra credit reading: [What are waves?](#), due Mon. July 21

- Thu., July 10: Fluid Statics (Ch. [14](#))

[Lab 4](#): Archimides and Springs | Pre-lab: read Ch. [14.4](#)

- Mon., July 14: Fluid Dynamics and Sound Waves (Ch. [16](#) and Ch. [17](#))

Handout: [notes](#) on the Navier-Stokes equation and the wave equation

- Tue., July 15: Fluid Dynamics and Sound Waves (Ch. [16](#) and Ch. [17](#))
- Wed, July 16: Problem-Solving Session | Sound Waves, Waves, and Fluids (Ch. [14](#), Ch. [16](#), and Ch. [17](#))
- Thu., July 17: Sound Waves (Ch. [17](#))

[Lab 5](#): Speed of sound experiment | Pre-lab: re-read Ch [17.2](#) and watch [this video](#)

- Mon., July 21: Quiz Chp. 14, 16 & 17 ([Practice](#)) | Sound Waves, Waves, and Fluids (Ch. [14](#), Ch. [16](#), and Ch. [17](#))
- Tue, July 22: Heat and Thermodynamics I (Ch. [1b](#)) and Ch. [2b](#))

Homework 5 due.

- Wed., July 23: Thermodynamics I (Ch. [2b](#))
- Thu., July 24: Thermodynamics I (Ch. [1b](#)) and Ch. [2b](#))

[Lab 6](#): Thermal expansion | Pre-lab: re-read Ch [1.3b](#)

[Final Exam Week: July 28–August 1st. ([Practice](#))]