



SOUTH CAROLINA GOVERNOR'S SCHOOL FOR

SCIENCE+ MATHEMATICS

Course	PHY 161 - General Physics 1 (Dual Enrolled w/ FMU)
Semester	Fall 2024
Lecture	TuThFr 1-2 TuThFr 2-3 TuThFr 3-4
Lab	Mo 2-3 Tu 10-12 We 2-4
Location	C-107 and https://gssm.zoom.us/j/8622923374
Instructor	Dr. Reginald Bain ✉ rbain@governors.school ☎ 843-383-3900 🏢 Office: B166/Zoom (862-292-3374) 🕒 Office Hours: By appointment OR MoWe 10-11, 1-2, ThFr 10-11

I. Course Description

1. Course Summary

- PHY 161/PHYS 215 General Physics I is an algebra-based introduction to mechanics, thermodynamics, and waves. Topics include motion in one and two dimensions, Newton's laws of motion, equilibrium, work, energy, momentum, rotational motion, gravity, heat, waves, and sound. Examples from medicine and biology will be included whenever possible.

2. College Credit Hours (Dual-Enrollment)

- This course is dual enrolled with **PHYS 215 General Physics I at Francis Marion University** (FMU) and taught by a GSSM instructor. Students will each have a FMU transcript with their overall grade earned in this course. Students may earn up to 4 college credit hours depending on their grade and the transfer policies of their college/university. Refer to the [Dual Enrollment FAQ in the Course Catalog](#) for more information.

3. Learning Outcomes

- Upon completion of this course, students will be able to:
- Apply the laws of classical Newtonian mechanics (motion, force, energy, momentum, and gravitation) to solve problems involving static systems, motion with constant acceleration, and rotational motion.
- Use techniques of graphical analysis to classify and model physical phenomena and apply physical meaning to mathematical techniques from algebra, pre-calculus, and trigonometry.

- d. Work collaboratively inside and outside the classroom through activities such as polling questions, hands-on experiments, guided inquiry exercises, and group problem-solving assignments.
- e. Collect, analyze, and present scientific data through weekly labs, data-focused problems, and technical writing tasks.

4. Pedagogy

- a. This course will help students develop key problem-solving and critical thinking skills through a student-centered, active approach to learning. The course will incorporate guided, inquiry-based activities, group problem-solving, and peer-instruction in order to promote active student engagement.

II. Laboratory

1. Learning Outcomes

- a. Lab offers students the chance to gain interactive experience with scientific principles, develop their data collection/analysis skills, and work collaboratively with other students to complete experiments and solve problems as a group.
- b. Lab will consist of a mixture of hands-on experiments, inquiry-based group work, individual problem-solving, data analysis, experimental design, and online physics simulations such as those designed by the PhET collaboration.

2. Assignments

- a. Students will complete weekly lab assignments that will be written in Google Docs and utilize Google Sheets extensively. Most labs will be submitted electronically to Canvas but some will be written by hand. Some activities will require students to work in groups of 3-4 and others will require students to turn in work individually. During most weeks, the assignment should be completed and submitted during the lab period.
- b. Students may be asked to complete a more formal lab write-up or other technical writing assignment following a specific rubric (rubric will be posted to Canvas). Such an assignment will count for 15% of the total lab grade.

III. Required Resources

1. Textbook Resources

- a. Physics: Principles with Applications, 7th ed., Douglas C. Giancoli — Primary text for course. A physical copy is provided to students.
- b. OpenStax College Physics — An additional free e-textbook will be provided to students on Canvas as an additional course resource.
- c. Additional Resources — Students will be asked to use a wide variety of simulations, watch online physics videos, and may be assigned additional reading from resources outside the text above. Such readings and assignments will be provided on Canvas and with each WebAssign homework assignment.

2. WebAssign

- a. Students will submit HW assignments and complete in-class tests using WebAssign, an online platform used by many universities that provides students with instant feedback on problem responses along with helpful tutorials.
- b. How to sign up: **See "WebAssign Registration" module on Canvas** for help with signing up for a WebAssign account and the class key code.

3. Needed Supplies

1. **To the class**, students should, at minimum, bring...
 - (1) Writing utensils with notebook, printed notes, or tablets/iPad.
 - (a) **Note - Students should NOT use their phone or laptop in class.**
 - (b) **Note - Students should NOT wear headphones during class.**
2. **To the lab**, students should bring...
 - (1) One person per group should bring a laptop if possible. I have a few classroom laptops as well. This will be used for Google Docs/Google Sheets/LoggerPro
 - (2) Writing utensil with notebook/something to write on (tablets are ok)
 - (3) Whenever available, students should read lab instructions in advance

IV. Grading

1. Grading Scale

- a. Numeric grades will be calculated using the weighting shown below.

Grade Weighting		GSSM/State Grading	FMU Grading Scale
20%	Homework	Numerical grades will be on your state/GSSM high school transcript. Letter grades are based on the following 10-point Grade Scale <i>A : 90 – 100</i> <i>B : 80 – 89.5</i> <i>C : 70 – 79.5</i> <i>D : <70</i> Grades will be regularly updated on Canvas <i>Students must earn a final grade of C or better to satisfy GSSM graduation requirements.</i>	Letter grades will be on your FMU transcript
20%	Lab/Participation		<i>A: 90 – 100</i>
45%	Tests (4 x 11.25%)		<i>B+: 87 – 89</i>
15%	Final Exam		<i>B: 80 – 86</i>
			<i>C+: 77 – 79</i>
			<i>C: 70 – 76</i>
			<i>D+: 67 – 69</i>
			<i>D: 60 – 66</i>
			<i>F: < 60</i>

- b. In-class participation (answering in-class clicker questions and completing activities in class and labs in good faith) will count towards the lab/participation grade. Students must answer every question posed in class using polling/clickers.
- c. Any potential quizzes will count towards the HW grade.

2. Keys for success

- a. **Group vs. Individual Work:** Students are encouraged to work together with classmates but must ensure that they gain their own individual understanding of material. Students must allot time for self-study alone without others.
- b. **Don't Procrastinate:** I recommend that students make time each day to work on problem sets in advance of the deadline. Cramming the night before an assignment or exam is an ineffective way to learn physics and will result in poor test scores. Physics demands a daily, systematic, and focused approach to studying.
- c. **Practice makes perfect:** Solving physics problems is a skill that requires practice. It is NOT a game of memorizing equations or solutions to specific problems.

V. Course Policies

1. Prerequisites/Co-requisites

- a. Initial math placement in MAT111-H or above.

2. Attendance & Participation

- a. **Attending Class:** Students are required to attend all of their classes and labs at GSSM unless they have excused absences. The electronic excused absence form can be found online and must be completed three days prior to the planned absence. Complete information may be found in the student handbook section "Attendance, Absences, and Makeup Policy."
- b. **Lab Tardiness:** Students should arrive on-time to class and lab. Students who are more than 10 minutes late to the lab without a proper excuse (excused absence form filed in advance of the lab, nurse visit, etc.) will be marked tardy AND will receive an automatic 15 point deduction. Students who are more than 30 minutes late for the lab will receive a 0% on the lab.
- c. **Lab Absence:** If a student has an excused absence from the lab, they should email the instructor and will either be asked to attend another section or attend virtually/remotely if possible and may be given an alternate assignment in certain cases.
- d. **No Headphones:** Students who wear headphones or use electronic devices during class in lieu of actively participating (as defined by the instructor) will be counted as absent. Unless the instructor has asked students to use electronic devices for academic purposes, their use is not allowed. Wearing headphones during class/lab is prohibited.
- e. **Clickers:** This class is designed to be student-centered and highly interactive. Students are expected to actively participate during every class. This includes answering any and all clicker-style poll questions using provided TurningPoint clickers, solving "Follow-Up" problems individually and in small groups (written solutions will occasionally be collected for grading), participating in group and class discussions, and completing in-class assignments. Failure to actively participate during class will incur a grade penalty.

3. Homework

- a. Done via WebAssign, roughly 1-2 assignments will be due per week constituting ~10-20 problems/week. Deadlines are always visible online. Students are responsible for checking WebAssign/Canvas for due dates.
- b. Students SHOULD NOT leave these assignments until the last minute and should individually budget several hours of time to work on problems each week that works with their schedule. Typical HW deadlines will be Tuesday/Friday evenings.
- c. A list of daily reading assignments is posted on Canvas. Students should read the assigned sections before each class period.

4. Missed/Late Assignments

- a. **Missed/late assignments without an official excused absence will receive no credit.** If a student will miss class because of an excused absence, students may request an extension from the instructor beforehand. They can request this extension directly on WebAssign. **Extensions will only be provided for excused absences. Otherwise, no late work is accepted.**
- b. Valid excuses include classes missed due to documented illness or other excused absences. Forgetting to do an assignment, neglecting to do an assignment due to other coursework, and running out of time are NOT considered valid excuses.

5. Tests/Exams

- a. **How they are administered:** Unless specified by documented special accommodations in advance, mid-term exams will be given during class and must be finished during the 53-minute class period. Tests will be completed on WebAssign and primarily divided into multiple choice and free response (where partial credit is possible) sections similar to AP exams. Test corrections assignments may be assigned at the discretion of the instructor to potentially recover a percentage of points lost. This percentage will depend on the overall class performance on the exam and will be at the discretion of the instructor on a case by case basis.
- b. **What to Bring:** Students should bring a writing utensil, a laptop/tablet for entering answers on WebAssign and a phone to scan/upload any written work for free response questions. They should also bring an AP approved calculator. A formula sheet and scratch paper will be provided. See link for list of approved calculators:
<https://apstudents.collegeboard.org/exam-policies-guidelines/calculator-policies>.
- c. **Make up tests:** No student is required to take more than three full-period tests on any day. If a student has more than three tests scheduled for one day, they should talk to their instructor(s) no later than 48 hours (2 days) in advance. If the instructor(s) cannot accommodate the request, the student should consult the Senior Vice President for Residential to determine the best course of action.

6. Accommodations

- a. Any student with accommodations needs to have a current plan on file with the Director of the Center for Academic Success (Ms. Kyle Barnett) and should meet with their instructor at the start of the course to determine how best to accommodate the plan.

7. Academic Integrity

- a. Academic integrity is “a commitment, even in the face of adversity, to six fundamental values: honesty, trust, fairness, respect, responsibility, and courage” (International Center for Academic Integrity website). A lack of academic integrity prevents students from learning and undermines our community, and is therefore strictly prohibited. GSSM's academic integrity policy (as explained in the GSSM Student Handbook) covers all school-related academic work, both in and out of class.
- b. Students who engage in plagiarism/cheating will receive a 0% on a given assignment/exam and will be subject to disciplinary action including letters to parents, recommendations to the judicial council, etc. Students may work together on homework, in-class assignments, and labs, but must turn in their own unique and individual work. Copied work will not be accepted and will be assigned a 0%. During quizzes/exams, if a phone is seen being used or cheating is observed, a 0% will be assigned.

8. Inclusion

- a. In this class, we will all maintain a community in which every person feels welcomed, valued, and respected. It is expected that you will treat your classmates graciously and responsibly and that you will show respect for diverse perspectives, especially in terms of race, gender, sexuality, religion, national origin, disability status, and socioeconomic status.

VI. Course Schedule

1. Exams & Important Dates

- a. Although **TEST DATES ARE SUBJECT TO CHANGE**, I estimate that the 4 major tests will occur roughly the week of each of the dates below. **One-week notice will always be given** when exam dates are finalized. These dates will depend on how the class is performing, days missed due to extreme weather, etc.
 1. Exam 1 (App. A, Ch 0-2) — Tuesday, September 3rd
 2. Exam 2 (Ch 3-4) — Tuesday, October 1st
 3. Exam 3 (Ch 4/5-6) — Tuesday, October 29th
 4. Exam 4 (Ch 7-8) — Thursday, November 21st
 5. Final Exam (Cumulative) — (Tentative) Monday, December 9th (3 hours)

2. Rough Approximation of Course Schedule

Week	Chapter	Lab	Notes
Aug 12	Ch 1, App. A	Lab 1 - Measurement & Uncertainty	
Aug 19	Ch 2-3	Lab 2 - Introduction to Data Analysis	
Aug 26	Ch 2, 3	Lab 3 - 1D Kinematics	

Sep 2	Ch 2-3	Lab 4 - Vectors	Exam 1 (App A, Ch 0-2)
Sep 9	Ch 4-5 (5.1-5.4)	Lab 5 - Empirically Discovering Physical Laws	
Sep 16	Ch 4-5 (5.1-5.4)	Lab 6 - Projectile Motion	
Sep 23	Ch 4, 5 (5.1-5.4)	Lab 7 - Finding g Empirically	
Sep 30	Ch 6-7	Lab 8 - Newton's 2nd Law (Half-Atwood)	Exam 2 (Ch 3-4)
Oct 7	Ch 6-7	Lab 9 - Coefficients of Friction	
Oct 14	Ch 6-7	Lab 10 - Circular Motion	
Oct 21	Ch 6-7	Lab 11 - Work-Energy Theorem	
Oct 28	Ch 8-9	Lab 12 - Conservation of Energy	Exam 3 (Ch 4-6)
Nov 4	Ch 8-9	Lab 13 - Conservation of Momentum	
Nov 11	Ch 8-9	Lab 14 - Rotational Kinematics	
Nov 18	Ch 5 (5.4-5.8), 11-13	Lab 15 - Rotational Dynamics	Exam 4 (Ch 7-8)
Nov 25	Thanksgiving	Thanksgiving	Thanksgiving
Dec 2	Ch 5 (5.4-5.8), 11-13	Lab 16 - Angular Momentum	
Dec 9	Final Exam Week	Final Exam Week	Final Exam (All)

VII. Other Policies

1. Disclaimer

- This syllabus is subject to change at the discretion of the instructor.

2. Office Hours

- Students are encouraged to come see me for office hours to ask questions and discuss course material. These will generally be held in C-107. I have listed some drop-in times above and can schedule individual meeting times with students via email.
- I highly recommend that students use the "Ask Your Teacher" option on WebAssign to send me HW questions. This is a quick and efficient way to ask questions at any time throughout the day. I will respond as quickly as I can to these questions.

- c. Students should come to office hours with specific questions/issues having already tried the HW. Students should not simply start/do their homework while meeting with me in my office.
- d. Additionally, students should take advantage of the Center for Academic Success including:
 - i. Peer Tutoring Labs: We offer tutoring in 11 subjects. Most labs are open 8–10 pm Sunday–Thursday during the school year; hours may differ when labs are virtual. No appointments necessary.
 - ii. Individual Assistance: Please email the director, Ms. Kyle Barnett, for one-on-one help with tasks like learning how to study more effectively, creating a study schedule, organizing materials, or setting priorities.
 - iii. Resources: We have resources in C127 to help you get organized and study well.