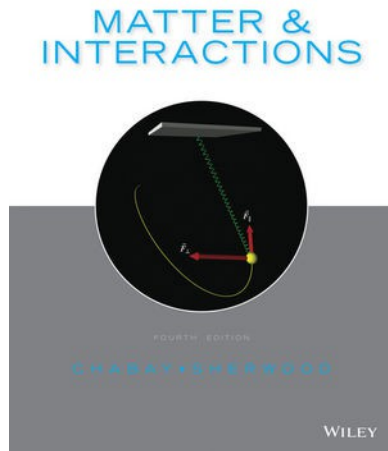


PHYS 2212



- Our textbook *Matter & Interactions, Vol. II: Electric and Magnetic Interactions, 4th Edition* by R. Chabay & B. Sherwood (John Wiley & Sons 2015) is available new at the campus bookstore. A version of the textbook is also available online at a reduced rate <http://goo.gl/JPzfha>. Access to the text, however, comes with restrictions.
- The M&I version of 2212 deals with electric and magnetic interactions, which are central to the structure of matter, to chemical and biological phenomena, and to the design and operation of most modern technology.

The main goal of this course is to have you engage in a process central to science: **the attempt to model a broad range of physical phenomena using a small set of powerful fundamental principles.**

The specific focus is an introduction to field theory, in terms of the classical theory of electricity and magnetism ("E&M"). To aid in this focus you will develop computational models to visualize these fields and the interaction of charged particles using the VPython programming language (available for free from www.vpython.org). The course also emphasizes the atomic structure of matter, especially the role of electrons and protons in matter.

Topics include:

- Matter and electric field, polarization of atomic matter
- Electric fields of distributed charges, setting up physical integrals, numerical integration
- Electric potential and energy for fields
- Magnetic field, atomic model of ferromagnetism
- A microscopic view of electric circuits, surface charge model
- Capacitors, Inductors, Resistors, and Batteries
- Magnetic force, including motional emf
- Patterns of field in space (Gauss's and Ampere's laws)
- Faraday's law and non-coulomb electric field
- Electromagnetic radiation, including its production by accelerated charges and re-radiation (classical interaction of light and matter)

By the end of the course, you will be able to:

- Apply a small set of fundamental physical principles to a wide variety of situations.
- Use these principles to explain a wide variety of physical phenomena.
- Use these principles to predict the behavior of a variety of physical systems.
- Model complicated physical systems by making idealizations and approximations.
- Create a 3D, animated computer model of a physical situation involving particles and fields.

Evaluation

Numerical ranges for final grades are as follows: 90-100 points = A, 80-89 points = B, 70-79 points = C, 60-69 points = D, 0-59 points = F. Final grades will not be curved:

The Core Points – 90 points of required work for all students

45pts - Evening Tests: There are four evening tests weighted from your lowest to highest test score (6pts, 9pts, 12pts, 18pts). The dates for these test are listed on the course schedule.

- The format is a combination of multiple choice and free response
- Closed book except for a formula sheet (found in our course resources and provided with your test)
- ADAPTS students are encouraged to take the test with our ADAPTS proctor in Howey
- After each exam a test wrapper will be posted to WebAssign. These wrappers are post exam reflection exercises that help you focus on common errors and time management. They will be worth optional credit

25pts - Final Exam: Your final exam schedule: <http://www.registrar.gatech.edu/students/exams.php>

20pts - Laboratory: Lab begins the second week of class, please bring your laptop with you to lab.

- You must attend the lab section for which you are registered in order to receive credit.
- Lab exercises will account for 15pts of your final grade in the course and may include group problems, experiments or computational modeling.
 - Each lab will have an associated assignment on WebAssign to be completed in lab. These assignments are worth 5 of the 15 lab points
 - Your TA will assess your work through a series of checkpoints to be completed in lab. These checkpoints will account for 10 of the 15 lab exercise points
- At the start of each lab, students will have 25 minutes to complete a lab quiz. Your lab quizzes will account for 5 of the 20pts of your final grade in the course.

The Bucket Points – Earn 10 points plus 2 points of extra credit

5pts - Homework: A homework assignment will be due every Sunday Evening.

- You may access assignments by logging into T-Square and clicking on the WebAssign link

3pts - Participation: Class participation is monitored through a series of in-class polling-type questions.

- In order to participate, each student will need a Turning Technologies ResponseCard from the bookstore: More info on this system is given here: <http://www.cetl.gatech.edu/it/clicker>

2pts - Wiki Resource Add a page to the class wiki resources www.physicsbook.gatech.edu

2pts - Optional Assignments Additional physics problems posted for each chapter and due before each test

2pts - Public Lecture Reviews A listing of available lectures and guidelines will be posted to Piazza

1pt - Reading Assignments A few questions on the reading assignments are due each Wednesday

Guidelines

Honor

- The policy on academic honesty as stated in the Honor Code will be fully enforced during this course for both the instructor and student: <http://www.honor.gatech.edu>
- Collaboration with other students in this course on homework assignments and in-class activities is permitted and encouraged.
- Students are not permitted to use a second WebAssign account.
- Collaboration is not permitted on lab quizzes, tests, or the final exam.
- Students are not permitted to use another student's Clicker in lecture.
- Honor code violations will be referred to the Dean of Students office.

Testing

- If you are more than 15 minutes late for an evening tests or final exam you will not be permitted to begin except at the discretion of the proctor.
- A formula sheet for all quizzes, tests, and exams can be found in our course resources.
- If you are an ADAPTS student please contact Dr. Greco to discuss your accommodation.
- If you feel that an error has been made in the grading of test, you will have until the start of the next test to submit your test for regrade to your graduate TA.
 - You will be required to include a regrade form found in our class resources.
 - If you are unable to meet with a graduate TA, please meet with Dr. Greco

Absences

- Students may be excused from core course work (exams or labs) if they:
 - Participated in an approved Institute activity (e.g. athletics, conferences, etc...), were required to appear in court, were suffering from a serious illness that required a doctors visit, experienced the death of an immediate family member, observed a religious holiday.
 - There are no makeup labs or quizzes, you can only be excused from these assignments.
 - If you are excused from an evening test your final exam grade will replace your missing test grade at the end of the term. Experience has shown this to be more beneficial for the student than giving a makeup test. If you disagree, please speak with Dr. Greco so that we can find a resolution.
 - Please visit Dr. Greco's office hours with documentation within one week of returning to campus.
- Missed course activities from the bucket can not be excused. Instead, students should complete additional bucket activities to make up for the missed work. No documentation is required but please contact Dr. Greco if you have questions or concerns.

Participation

- The secret to succeeding in this course is to actively participate in class and on Piazza
- Lectures meet Monday, Wednesday and Friday. Lectures are important because they give you the opportunity to ask questions and clear up points of confusion.
 - You will be responsible for taking your own notes. <http://goo.gl/xdKdrZ>
 - Each student must register the DeviceID for their ResponseCard, located on the back of their unit, through T-Square, by clicking on the left menu item “*Course Tools>Clickers*”
 - *This is true even if you are using the ResponseWare app on your cell phone*
- Keep up with the suggested reading for each lecture listed on the course schedule
 - Do the stop and think activities and inline exercises in the textbook; they really help.
- After studying the textbook sections, work through the WebAssign homework questions to check your understanding on your own or in a small group.

WebAssign

- Our coursework, both lecture and lab, will be completed using the WebAssign online homework system.
 - Accessed through T-Square by clicking on the left menu item “*Course Tools>WebAssign*”
 - Access has already been purchased using a portion of your lab fee.
 - Your overall grade for the course will also be visible here
- You are given three submissions for each question part within an assignment.
- Extension request for an individual assignment will be handled automatically by the WebAssign system with a 10 point penalty for each extension.
 - You are allowed a maximum of two extensions per assignment.
 - You may only complete an extension within a 48 hour window of the original due date.
 - Once you request an extension, you will immediately be given 12 hours to complete the assignment.

Getting Help

- Instructors are available to discuss physics related problems during office hours.
- Graduate TAs operate the physics help desk in Clough Commons
 - <http://www.success.gatech.edu/tutoring/commons>
 - Be sure to ask for a physics TA as we share the room with other departments
- Any issue related to the administration of the course should be directed Dr. Greco.
 - Because so many students are taking M&I courses, it is to your advantage to stop by Dr. Greco's office in person during his office hours or make an appointment; email is a poor avenue of communication.
- **You can request online help from students, TAs and instructors through Piazza**
 - Helpful responses are more likely if you don't wait until the last minute.
 - Accessed through T-Square by clicking on the left menu item “*Course Tools>Piazza*”