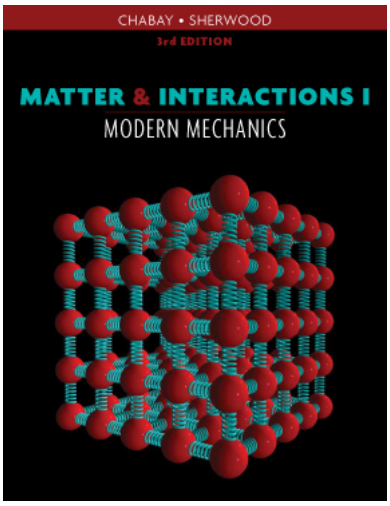

PHYS 2211

- Our textbook is ***Matter & Interactions, Vol. I: Modern Mechanics, 3nd Edition by R. Chabay & B. Sherwood (John Wiley & Sons 2010)***, and is available new and used at the campus bookstore. A version of the textbook is also available online at a reduced rate. Access to the text, however, is only available during the semester and requires an internet connection.
- The M&I version of 2211 emphasizes the atomic nature of matter and integrates traditional mechanics with thermal physics. There is strong emphasis on the Momentum Principle, the Energy Principle (the first law of thermodynamics) and the Angular Momentum Principle.

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. To aid in this goal you will develop computational models that predict the motion of interacting objects. These models will be made using the VPython programming language (available for free from www.vpython.org). The course also emphasizes the atomic structure of matter, especially the ball and spring model of solids, and photon emission and absorption in quantized systems.

Topics include:

- The different types of matter and interactions found in nature
- Using the momentum principle to predict future motion
- An atomic model of solids
- The momentum principle in moving reference frames
- Energy conservation
- Energy in macroscopic systems including thermal energy
- Multi-particle systems and the center of mass
- Collisions including relativistic particle collisions
- Angular momentum

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.
- Make macro-micro connections, based on the atomic nature of matter.
- Modeling physical systems: make idealizations, simplifying assumptions, estimates.
- Constructing computational models to predict the time evolution of system behavior.

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:

25pts - Evening Tests: There are two evening tests, dates are listed on the course schedule.

- The tests are free response and closed book; a formula sheet will be provided.

20pts – Friday Quiz: There are eight quizzes given during lecture on Fridays

- The quizzes are free response and closed book; a formula sheet will be provided.
- **Your lowest quiz score is dropped.** Quiz dates are listed on the course schedule.

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

25pts - Laboratory: ....

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- **10pts** will be earned for successfully completing group problem solving activities and lab report presentations. These activities will including providing feedback to your peers on in-lab presentations.
- **5pts** will be earned for submitting a video report, **5pts** will be earned based on the quality of your evaluations of student videos, and **5pts** will be earned based on the quality of your video as determined by other students and your instructor (through calibrated peer review).

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

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

2pts – Optional Assignment: To makeup missed homework

- Two post exam reflection exercise on errors and time management
- End of chapter problems
- Additional assignments offered at the discretion of the instructor

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/index.php
- Collaboration with other students in this course on homework assignments and in-lab activities is permitted and strongly encouraged.
- Students may not use a second WebAssign account or another students clicker.
- Collaboration is not permitted on test, quizzes, exams or in-class clicker questions.
- Unless otherwise specified, each student must make and record their own observations, models, and evaluations for lab reports
- Honor code violations will be referred to the Dean of Students office.

Testing

- Students are expected to be on time for all tests. 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 will be posted to T-Square.
- If you are an ADAPTS student please contact Dr. Greco
- 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 meet with a graduate TA to discuss the error.
  - Graduate TAs hold regular office hours Clough Commons room 278.
  - 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, you can only be excused from these assignments.
  - If you are excused from a test or quiz 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.
  - For all circumstances, please contact Dr. Greco with documentation within one week of returning to campus
- Missed homework can not be excused. Instead, students should complete optional assignment 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 both in class on Piazza
- Lectures meet Monday or 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, so please show up on time and pay attention.
  - Before lecture starts please power down or silence laptops and mobile devices.
  - 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"*
- Each week, keep up with the assigned videos and suggested reading listed on Coursera
  - Do the stop and think activities and inline exercises in the textbook.
- After studying the textbook sections, work through the WebAssign homework questions to check your understanding on your own or in a small group.

WebAssign

- Textbooks purchased at the bookstore are bundled with an access code to the WebAssign online homework system that will be used in this class. If you own a used textbook you will be able to purchase an access code to WebAssign after logging in.
  - An online version of the textbook is also available through WebAssign at a significantly reduced rate. Access to the text, however, is only available during the semester and requires an internet connection.
- 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/physics-tutoring-schedule
  - Be sure to ask for a physics TA as we share the room with Chemistry.
- 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 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"*

Week 1	Date	Topics	Reading
Monday	05/11/15	Interactions, Vectors and Units.	1.1-1.6
Wednesday	05/13/15	Velocity and Momentum	1.7-1.11
Friday	05/15/15	Momentum, The Momentum Principle	2.1-2.2
		Friday Quiz 1	
Lab		Start Lab 1 – Constant Velocity	

Week 2	Date	Topics	Reading
Monday	05/18/15	Constant Force I	2.3, 2.6
Wednesday	05/20/15	Constant Force II	2.6
Friday	05/22/15	Iterative Prediction of Motion I	2.4-2.5
		Friday Quiz 2	
Lab		Submit Lab 1 – Constant Velocity	

Week 3	Date	Topics	Reading
Monday	05/25/15	Iterative Prediction of Motion II	2.5, 2.8-2.11
Wednesday	05/27/15	Fundamental interactions, the gravitational force	3.1-3.3
Friday	05/29/15	Predicting motion (non-constant forces), reciprocity	3.4-3.5
		Friday Quiz 3	
Lab		Start Lab 2 – Non-Constant Velocity	

Week 4	Date	Topics	Reading
Monday	06/01/15	The electric force, sensitivity to initial conditions	3.6-3.10
Wednesday	06/03/15	Conservation of momentum	3.11-3.13
Friday	06/05/15	Identifying forces, unchanged momentum	5.1-5.2
		Test 1: 6:00pm – 7:30pm	
Lab		Submit Lab 2 – Non-Constant Velocity	

Week 5	Date	Topics	Reading
Monday	06/08/15	Curving Motion I	5.3-5.5
Wednesday	06/10/15	Curving Motion II	5.5-5.7
Friday	06/12/15	Curving Motion Problems	
		Friday Quiz 4	
Lab		Start Lab 3 – Black Holes	

Week 6	Date	Topics	Reading
Monday	06/15/15	Energy Principle	6.1-6.2
Wednesday	06/17/15	Work and energy	6.3-6.4
Friday	06/19/15	Work by non-constant forces	6.5-6.7
		Friday Quiz 5	
Lab		Submit Lab 3 – Black Holes	

Week 7	Date	Topics	Reading
Monday	06/22/15	Potential energy	6.8-6.11
Wednesday	06/24/15	Gravitational potential energy	6.11-6.12
Friday	06/26/15	Electric potential energy, potential energy graphs	6.13-6.17
		Friday Quiz 6	
Lab		Start Lab 4 – Oscillations	

Week 8	Date	Topics	Reading
Monday	06/29/15	Spring potential energy	7.1-7.3
Wednesday	07/01/15	Choice of system, energy dissipation	7.9-7.11
Friday	07/03/15	Thermal energy, transfer of energy	7.4-7.8
		Friday Quiz 7	
Lab		Submit Lab 4 – Oscillations	

Week 9	Date	Topics	Reading
Monday	07/06/15	Vibrational and rotational energy	9.1-9.3
Wednesday	07/08/15	Point particle model I	9.4-9.5
Friday	07/10/15	Point particle model II	9.4-9.5
		Friday Quiz 8	
Lab		Start Lab 5 – Choose Your Own Adventure	

Week 10	Date	Topics	Reading
Monday	07/13/15	Collisions	10.1-10.3
Wednesday	07/15/15	Angular momentum and torque	11.1
Friday	07/17/15	Translational and rotation angular momentum	11.2-11.3
		Test 2: 6:00pm – 7:30pm	
Lab		Submit Lab 5 – Choose Your Own Adventure	

Week 11	Date	Topics	Reading
Monday	07/20/15	Angular momentum principle	11.4-11.6
Wednesday	07/22/15	Analyzing zero-torque motion	11.7
Friday	07/24/15	Analyzing non-zero-torque motion	11.8-11.9
Lab		No Lab	

Week 12	Date	Topics
TBD	TBD	Final Exam