

Course Syllabus

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Course Overview

Our required textbook will be: *Matter & Interactions* (<https://matterandinteractions.org/>), Vol. I: Modern Mechanics, 4th Edition by R. Chabay & B. Sherwood (John Wiley & Sons 2015). A schedule of topics can be found in our [Schedule](#) .

- **An electronic version of this book is included with your WileyPlus account and covered by your lab fee. You do not need to purchase a book unless you prefer a hard-copy.**

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 Visual Python programming language (run in your browser at www.glowscript.org (<http://www.glowscript.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 including relativistic energy
- Energy in macroscopic systems including thermal energy
- Multi-particle systems and the center of mass
- Collisions including relativistic particle collisions
- Angular momentum and quantized angular momentum
- Energy quantization and photon emission and absorption

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.
 - Communicating scientific ideas is a big part of the laboratory.
- Make macro-micro connections, based on the atomic nature of matter.
- Model physical systems: make idealizations, simplifying assumptions, estimates.

- Construct computational models to predict the time evolution of system behavior.

Determining your Grade

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.

- **27pts - Tests:** There are three tests weighted from your lowest to highest test score (6pts, 9pts, 12pts). The dates for these tests are listed on the [course schedule](#) .
 - The format is a combination of multiple choice and free response
 - Closed book and notes except for a [Formula Sheet](#)  (provided)
 - Test grading will follow our common [Grading Rubric](#) 
 - Regrades should be addressed to the instructors by the start of the next test.
- **25pts - Final Exam:** Your final exam schedule: <http://www.registrar.gatech.edu/students/exams.php>
[_\(http://www.registrar.gatech.edu/students/exams.php\)](http://www.registrar.gatech.edu/students/exams.php)
- **28pts - Laboratory:** Labs begins the first week of class
 - There are five labs that you must complete on your own
 - Due dates for each lab are listed on the [Schedule](#) 
 - 10pts will be earned based on the quality of your **video lab report** as determined by your peers according to the [video lab report rubric](#) 
 - Each person will need to evaluate 3 peers' lab reports
 - Peer evaluations are due one week after the lab is due
 - If you require a regrade for a lab report, contact Prof Schatz
 - 3pts will be earned by completing the **lab grading practice** assignments
 - These are due three days after the lab submissions
 - 5pts will be earned for participating in **lab draft presentations (and feedback)** with your lab group
 - 10pts will be earned for actively completing **group problem solving** activities
 - You must meet with your group and instructor online each week in order to receive participation credit
- **15pts - Individual Presentation Problems:**
 - Students will be assigned test-level problems and asked to present a solution to their instructor in an online meeting one week later
 - The instructors will grade both the solution and the quality of the presentation
 - Presentation weeks are listed on the [Schedule](#) 
- **5pts - Homework:** All other course work is completed online on edX
 - Coursework is due every Sunday evening at 11:59pm EDT
 - You are given multiple submissions for each question part within an assignment

Note that due to the exam weighing, the grade that Canvas shows you is NOT your correct course grade. To accurately determine your course grade, please make use of this spreadsheet: [WhatsMyGradeGTL.xlsx](#) 

Course Guidelines

General guidelines for handling absences, getting help, or academic misconduct. If you are unsure about a policy please contact Prof Schatz.

Excused Absences

Students may be excused from coursework 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 requires a doctor's visit, experienced the death of an immediate family member, or observed a religious holiday.

- Please contact Prof Schatz with documentation within one week of returning to class.
 - Alternatively you can contact the Dean of Students office with documentation and they will notify all of your instructors once your absence has been excused.
- If you are excused from a 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 feel strongly that you would prefer a makeup test, please speak with Prof Schatz so that we can find a resolution.
- Lab submissions can not be excused. If you think your absence will impact your lab submission, please contact Prof Schatz so that a resolution can be found
- Online group participation will either be excused or rescheduled.

Academic Misconduct

The policy on academic honesty as stated in the [Honor Code](http://policylibrary.gatech.edu/student-affairs/academic-honor-code) (<http://policylibrary.gatech.edu/student-affairs/academic-honor-code>) will be fully enforced during this course for both the instructor and student. All Honor code violations will be referred to the Dean of Students office.

- Collaboration with other students in this course on: homework assignments, lab assignments, and in-class activities is permitted and encouraged.
- Collaboration is not permitted on the problem presentations, tests, or the final exam.
- Students are not permitted to use more than one WileyPlus or edX account (which must be their own)

How to Succeed in This Course

The secret to succeeding in this course is to actively participate with your lab group, on your homework, and through online discussions. In general the course is scheduled so that an actively engaged student would:

1. Read the material that will be covered before watching the lecture videos
 - Do the stop and think activities and inline exercises in the textbook; they really help.
2. Watch the lecture videos, taking their own notes and asking questions to clear up points of confusion from the reading
3. Work through the homework questions to check your understanding on your own or in a small group.
 - Lab Material generally follows course material from the previous week
4. Actively participate with your lab group during group problem solving

5. Practice solving problems from the optional assignments, work through old exams and quizzes located in our course "Study Aids"
6. Get help early on
 - Instructors are available to discuss physics related problems via email, Canvas Discussions, or conference meetings.
 - You can request online help from students, TAs and instructors through Canvas Discussions

Any issue related to the administration of the course should be directed Prof Schatz. When in doubt please give him a call and ask for assistance.

Campus Support Services and Resources

In your time at Georgia Tech, you may find yourself in need of support. Below you will find some resources to support you both as a student and as a person.

Academic support

- Center for Academic Success <http://success.gatech.edu> [\(http://success.gatech.edu/\)](http://success.gatech.edu/)
- 1-to-1 tutoring <http://success.gatech.edu/1-1-tutoring> [_\(http://success.gatech.edu/1-1-tutoring\)](http://success.gatech.edu/1-1-tutoring)
- [_\(http://success.gatech.edu/1-1-tutoring\)](http://success.gatech.edu/1-1-tutoring) Peer-Led Undergraduate Study (PLUS)
<http://success.gatech.edu/tutoring/plus> [_\(http://success.gatech.edu/tutoring/plus\)](http://success.gatech.edu/tutoring/plus)
- Academic coaching <http://success.gatech.edu/coaching> [_\(http://success.gatech.edu/coaching\)](http://success.gatech.edu/coaching)
- Residence Life's Learning Assistance Program <https://housing.gatech.edu/learning-assistance-program> [_\(https://housing.gatech.edu/learning-assistance-program\)](https://housing.gatech.edu/learning-assistance-program)
- OMED: Educational Services (<http://omed.gatech.edu/programs/academic-support> [_\(http://omed.gatech.edu/programs/academic-support\)](http://omed.gatech.edu/programs/academic-support).)
- Communication Center (<http://www.communicationcenter.gatech.edu> [\(http://www.communicationcenter.gatech.edu/\)](http://www.communicationcenter.gatech.edu/).)

Personal Support

- The Office of the Dean of Students: <http://studentlife.gatech.edu/content/services> [_\(http://studentlife.gatech.edu/content/services\)](http://studentlife.gatech.edu/content/services); **404-894-6367**; Smithgall Student Services Building 2nd floor
- You also may request assistance at https://gatech-advocate.symplicity.com/care_report/index.php/pid383662? [_\(https://gatech-advocate.symplicity.com/care_report/index.php/pid383662?\)](https://gatech-advocate.symplicity.com/care_report/index.php/pid383662?)
- Counseling Center: <http://counseling.gatech.edu> [_\(http://counseling.gatech.edu/\)](http://counseling.gatech.edu/); **404-894-2575**; Smithgall Student Services Building 2nd floor
 - Services include short-term individual counseling, group counseling, couples counseling, testing and assessment, referral services, and crisis intervention. Their website also includes links to state and national resources.
 - Students in crisis may walk in during business hours (8am-5pm, Monday through Friday) or contact the counselor on call after hours at **404-894-2204**.