Course Syllabus

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Course Overview

Our required textbook will be: ***Matter & Interactions*** (https://matterandinteractions.org/), Vol. 2: Modern Mechanics, 4th Edition by R. Chabay & B. Sherwood (John Wiley & Sons 2015). A schedule of topics to be covered each lecture can be found in our **Course_Schedule.pdf**

- **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 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. To aid in this goal you will develop computational models to visualize these fields and the interaction of charged particles. 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 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.

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.

- **We will be using the Canvas Grades to keep track of your progress in this course. The Canvas grade book, however, can not accommodate our test weighting scheme or the bucket points (see below). This causes a small but significant error in the overall grade that Canvas reports to students. To accurately compute your grade, you will need to manually calculate a weighted average using the guidelines below or an external resource.**
- Final grades will not be curved and rounding is at the discretion of the instructors.

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

- **40pts - Evening Tests:** There are three evening tests weighted from your lowest to highest test score (7pts, 13pts, 20pts). The dates for these tests are listed on the course schedule.
  - The format is a combination of multiple choice and free response
  - Closed book except for a **Formula Sheet.pdf** (provided with your quizzes, tests, and exam)
  - ADAPTS students are encouraged to take the test with our Physics proctor in Howey
  - 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.
    - All quizzes, test, and exams will follow this general **Grading_Rubric.pdf**
    - Regrades can be requested before the start of the next exam through Gradescope.
- **25pts - Final Exam:** Your final exam schedule: **http://www.registrar.gatech.edu/students/exams.php (http://www.registrar.gatech.edu/students/exams.php)**
  - If you are an ADAPTS student you will need to schedule your final exam in the testing center.
  - Final exams are not returned to students but you can make an appointment to review your final.
- **25pts - Laboratory:** On-campus labs 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.
  - Each lab is completed online through Canvas
    - **(http://www.webassign.net/gatech/login.html)** 17 points are for participating as assessed by your TA through a series of checkpoints, answering numerical questions and uploading data/code
    - 8 points based on a small quiz given at the start of lab
      - Students will have 25 minutes to complete these quizzes.

The Bucket Points – Earn 10 points from any or all combination of these activities

Ten points of your final grade can be earned from the sources described below. If you do more than ten bucket points, you'll receive all ten bucket points, but no extra credit. The one exception to this is the extra credit for completing the homework early, which does indeed carry over to extra credit on your final grade.

- **5pts - Homework:** All course work is completed online WileyPlus
  - Access has already been purchased using a portion of your lab fee.
  - Coursework is due every Sunday evening at 11:59pm

    - You are given 10 submissions for each question part within an assignment.
        - After the third submission you incur a 5% penalty for that question part
    - Extension requests for an individual assignment will be handled automatically by Canvas. For each day late your score on that assignment is reduced by 1/7th. For example if you are two days late, your maximum possible scores is 5/7 the total available points for the assignment.
    - Correct submissions submitted more than 48 hours before the deadline earn a 40% bonus.
        - This is why the canvas grade book list homework scores out of 140 points instead of 100 points.
        - Homework scores greater than 100% can, potentially, count towards extra credit. For example, correct homework always submitted early earns 7 bucket points and if 5 bucket points are earned from other categories, 2pts of extra credit will be earned on the final course grade.
- **4pts - Participation:** Class participation is monitored through a series of in-class polling-type questions.
    - Each student will need to use the Turning Technologies App (free) or purchase a ResponseCard.
    - Each student must register their device (phone or ResponseCard) through Canvas by clicking on the left menu item
    - To earn full credit for participating during lecture you must complete at least 50% that lecture.
- **3pts - Optional Assignments**
    - Additional physics problems are posted for each chapter and due before each test
    - After each exam, a test wrapper will be posted to Canvas. These optional assignments are post exam reflection exercises that help you focus on common errors and time management.
- **2pts - Wiki Resource** Make a substantial improvement to an assigned topic on our class wiki resource.
    - The Student created course **Wiki** **(http://physicsbook.gatech.edu/Main_Page)**
    - Details for this assignment will be posted after the first evening test.
    - Part of your your score will be determined by peer review
- **1pts - Public Lecture Reviews** Evening lectures by visiting scientist.
    - 1/2 a point for attending one evening lectures (verified with a clicker)
    - 1/2 a point for submitting a video review for the lecture you attended
    - Part of your your score will be determined by peer review
- **1pt - Reading Assignments** A few questions on the reading assignments are due each week.
    - These assignments are a good way to stay current with our lectures and generally cover the main topics from each chapter.
    - A detailed, day-by-day, reading list can be found in our **Course_Schedule.pdf**

Course Guidelines

General guidelines for handling absences, getting help, or academic misconduct. If you are unsure about a policy please stop by Dr. Greco's office (Howey W206) during office hours for help.

Accommodations for Students with Disabilities

If you are a student with learning needs that require special accommodation, contact the Office of Disability Services at (404)894-2563 or **http://disabilityservices.gatech.edu/** **(http://disabilityservices.gatech.edu/)**, as soon as possible, to make an appointment to discuss your special needs and to obtain an

accommodations letter. Please also e-mail me as soon as possible in order to set up a time to discuss your learning needs.

Excused Absences

Students may be excused from core coursework (exams or labs) at the recommendation of the Dean of Students office or the office of the Registrar.

- If you plan to miss a test or lab please follow these instructions:
  - http://studentlife.gatech.edu/content/class-attendance
- Please visit Dr. Greco's office hours within two weeks of receiving a recommendation from the Dean or Registrar
  - There are no makeup labs or lab 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.

Missed coursework from the bucket can be handled automatically by the student. These missed activities or assignments can be made up by completing additional bucket activities without any notifications.

Academic Misconduct

The policy on academic honesty as stated in the **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 wiki assignments, during lab quizzes, tests, or the final exam.
  - If you are more than 15 minutes late for an evening tests or final exam you will not be permitted to begin.
- Students are not permitted to use more than one WileyPlus or TurningPoint account.
  - Students are not permitted to use another student's WileyPlus or TurningPoint account.

How to Succeed in This Course

As a member of the Georgia Tech community, your instructors are committed to creating a learning environment in which every student feel safe and included. Because we are individuals with varying needs, we are reliant on your feedback to achieve this goal. To that end, we invite you to enter into dialogue with us about the things we can stop, start, and continue doing to make our classroom an environment in which every student feels valued and can engage actively in our learning community.

The secret to succeeding in this course is to actively participate in class, one your homework, and through online discussions. The course schedule can be found in "**Files**" on the left menu. There you will see the topics covered in each lecture and lab and how they align with section of your textbook. In general the course is scheduled so that an actively engaged student would:

1. Read the material that will be covered before coming to lecture
   - Do the stop and think activities and inline exercises in the textbook; they really help.
2. Attend lecture, 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. Practice solving problems from the Optional Assignments leading up to a Test.
   - Work through old exams and quizzes located in our course "**Files**"
5. Get help early on
   - Instructors are available to discuss physics related problems during office hours.
   - **http://www.success.gatech.edu/tutoring/commons (http://www.success.gatech.edu/tutoring/commons)**
   - You can request online help from students, TAs and instructors through Campuswire

Any issue related to the administration of the course should be directed Dr. Greco. Because so many students are taking introductory physics 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.

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/)**
- 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)** Peer-Led Undergraduate Study (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)**
- Residence Life's 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)**)
- Communication Center (**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)** ; **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?)**

- Counseling Center: **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**.
- Students' Temporary Assistance and Resources (STAR): **http://studentlife.gatech.edu/content/need-help** (http://studentlife.gatech.edu/content/need-help)
  - Can assist with interview clothing, food, and housing needs.
- Stamps Health Services: **https://health.gatech.edu** (https://health.gatech.edu/) ; **404-894-1420**
  - Primary care, pharmacy, women's health, psychiatry, immunization and allergy, health promotion, and nutrition
- OMED: Educational Services: **http://www.omed.gatech.edu** (http://www.omed.gatech.edu/)
- Women's Resource Center: **http://www.womenscenter.gatech.edu** (http://www.womenscenter.gatech.edu/) ; **404-385-0230**
- LGBTQIA Resource Center: **http://lgbtqia.gatech.edu/** (http://lgbtqia.gatech.edu/) ; **404-385-2679**
- Veteran's Resource Center: **http://veterans.gatech.edu/** (http://veterans.gatech.edu/) ; **404-385-2067**
- Georgia Tech Police: **404-894-2500**

Course Summary:

Date	Details	
Fri Jan 10, 2020	**Homework Week 1** (https://gatech.instructure.com/courses/90726/assignments/353714)	due by 11:59pm
	Reviewing the Syllabus (https://gatech.instructure.com/courses/90726/assignments/353656)	due by 11:59pm
Sun Jan 12, 2020	**Lab 1 Computational Modelling** (https://gatech.instructure.com/courses/90726/assignments/353652)	due by 11:59pm
	Reading Week 2 (https://gatech.instructure.com/courses/90726/assignments/353774)	due by 11:59pm
Fri Jan 17, 2020	**Homework Week 2** (https://gatech.instructure.com/courses/90726/assignments/353728)	due by 11:59pm
Sun Jan 19, 2020	**Lab 2 Charged Tape** (https://gatech.instructure.com/courses/90726/assignments/353662)	due by 11:59pm
	Reading Week 3 (https://gatech.instructure.com/courses/90726/assignments/353776)	due by 11:59pm

Date	Details	
Fri Jan 24, 2020	Homework Week 3 (https://gatech.instructure.com/courses/90726/assignments/353730)	due by 11:59pm
Sun Jan 26, 2020	Reading Week 4 (https://gatech.instructure.com/courses/90726/assignments/353778)	due by 11:59pm
Fri Jan 31, 2020	Homework Week 4 (https://gatech.instructure.com/courses/90726/assignments/353732)	due by 11:59pm
Sun Feb 2, 2020	Lab 3 Electric Dipoles (https://gatech.instructure.com/courses/90726/assignments/353650)	due by 11:59pm
	Reading Week 5 (https://gatech.instructure.com/courses/90726/assignments/353780)	due by 11:59pm
Tue Feb 11, 2020	Chapter 13 Practice (https://gatech.instructure.com/courses/90726/assignments/353688)	due by 6pm
	Chapter 14 Practice (https://gatech.instructure.com/courses/90726/assignments/353690)	due by 6pm
	Chapter 15 Practice (https://gatech.instructure.com/courses/90726/assignments/353692)	due by 6pm
Fri Feb 14, 2020	Homework Week 5 (https://gatech.instructure.com/courses/90726/assignments/353734)	due by 11:59pm
Sun Feb 16, 2020	Lab 4 Distributed Charge (https://gatech.instructure.com/courses/90726/assignments/353664)	due by 11:59pm
	Reading Week 6 (https://gatech.instructure.com/courses/90726/assignments/353782)	due by 11:59pm
Fri Feb 21, 2020	Homework Week 6 (https://gatech.instructure.com/courses/90726/assignments/353736)	due by 11:59pm
Sun Feb 23, 2020	Lab 5 Potential Difference (https://gatech.instructure.com/courses/90726/assignments/353680)	due by 11:59pm
	Reading Week 7 (https://gatech.instructure.com/courses/90726/assignments/353784)	due by 11:59pm
Fri Feb 28, 2020	Homework Week 7 (https://gatech.instructure.com/courses/90726/assignments/353738)	due by 11:59pm

Date	Details	
Sun Mar 1, 2020	Lab 6 Magnetic Fields (https://gatech.instructure.com/courses/90726/assignments/353678)	due by 11:59pm
	Reading Week 8 (https://gatech.instructure.com/courses/90726/assignments/353786)	due by 11:59pm
Sun Mar 8, 2020	Lab 7 Magnetic Dipoles (https://gatech.instructure.com/courses/90726/assignments/353668)	due by 11:59pm
	Reading Week 9 (https://gatech.instructure.com/courses/90726/assignments/353788)	due by 11:59pm
Thu Mar 12, 2020	Homework Week 8 (https://gatech.instructure.com/courses/90726/assignments/353740)	due by 11:59pm
Sun Mar 22, 2020	Reading Week 10 (https://gatech.instructure.com/courses/90726/assignments/353762)	due by 11:59pm
	Test 1 Wrapper (https://gatech.instructure.com/courses/90726/assignments/353670)	due by 11:59pm
Tue Mar 24, 2020	Homework Week 9 (https://gatech.instructure.com/courses/90726/assignments/353742)	due by 11:59pm
Fri Mar 27, 2020	Homework Week 10 (https://gatech.instructure.com/courses/90726/assignments/353716)	due by 11:59pm
Sun Mar 29, 2020	Lab 8 Capacitors (https://gatech.instructure.com/courses/90726/assignments/353676)	due by 11:59pm
	Reading Week 11 (https://gatech.instructure.com/courses/90726/assignments/353764)	due by 11:59pm
Tue Mar 31, 2020	Chapter 16 Practice (https://gatech.instructure.com/courses/90726/assignments/353694)	due by 6pm
	Chapter 17 Practice (https://gatech.instructure.com/courses/90726/assignments/353696)	due by 6pm
	Chapter 18 Practice (https://gatech.instructure.com/courses/90726/assignments/353698)	due by 6pm
	Chapter 19 Practice (https://gatech.instructure.com/courses/90726/assignments/353700)	due by 6pm
Fri Apr 3, 2020	Homework Week 11 (https://gatech.instructure.com/courses/90726/assignments/353718)	due by 11:59pm

Date	Details	
Sun Apr 5, 2020	Lab 9 Magnetic Force (https://gatech.instructure.com/courses/90726/assignments/353658)	due by 11:59pm
	Reading Week 12 (https://gatech.instructure.com/courses/90726/assignments/353766)	due by 11:59pm
Sun Apr 12, 2020	Lab 10 Patterns of Fields (https://gatech.instructure.com/courses/90726/assignments/353672)	due by 11:59pm
	Reading Week 13 (https://gatech.instructure.com/courses/90726/assignments/353768)	due by 11:59pm
	Test 2 Wrapper (https://gatech.instructure.com/courses/90726/assignments/353660)	due by 11:59pm
Tue Apr 14, 2020	Homework Week 12 (https://gatech.instructure.com/courses/90726/assignments/353720)	due by 11:59pm
Fri Apr 17, 2020	Homework Week 13 (https://gatech.instructure.com/courses/90726/assignments/353722)	due by 11:59pm
Sun Apr 19, 2020	Lab 11 Faraday's Law (https://gatech.instructure.com/courses/90726/assignments/353654)	due by 11:59pm
	Reading Week 14 (https://gatech.instructure.com/courses/90726/assignments/353770)	due by 11:59pm
Tue Apr 28, 2020	Chapter 20 practice (https://gatech.instructure.com/courses/90726/assignments/353702)	due by 6pm
	Chapter 21 (part 1) Practice (https://gatech.instructure.com/courses/90726/assignments/353704)	due by 6pm
	Chapter 21 (part 2) Practice (https://gatech.instructure.com/courses/90726/assignments/353706)	due by 6pm
	Chapter 22 Practice Problems (https://gatech.instructure.com/courses/90726/assignments/353708)	due by 6pm
Fri May 1, 2020	Homework Week 14 (https://gatech.instructure.com/courses/90726/assignments/353724)	due by 11:59pm
Sun May 3, 2020	Lab 12 Radiation (https://gatech.instructure.com/courses/90726/assignments/353674)	due by 11:59pm
	Reading Week 15 (https://gatech.instructure.com/courses/90726/assignments/353772)	due by 11:59pm
	Wiki Resource Submission (https://gatech.instructure.com/courses/90726/assignments/353800)	due by 11:59pm

Date	Details	
Sun May 10, 2020	Public Lecture Review (https://gatech.instructure.com/courses/90726/assignments/353760)	due by 11:59pm
	Test 3 Wrapper (https://gatech.instructure.com/courses/90726/assignments/353666)	due by 11:59pm
Tue May 12, 2020	Homework Week 15/16 (https://gatech.instructure.com/courses/90726/assignments/353726)	due by 11:59pm
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	berger_11-25-2019 11-01 AM (https://gatech.instructure.com/courses/90726/assignments/353684)	
	Berger_9-27-2019 11-01 AM (https://gatech.instructure.com/courses/90726/assignments/353686)	
	Final Course Grade (https://gatech.instructure.com/courses/90726/assignments/353710)	
	Final Exam (https://gatech.instructure.com/courses/90726/assignments/353712)	
	Lab 10 Quiz 6 (https://gatech.instructure.com/courses/90726/assignments/353744)	
	Lab 11 Quiz 7 (https://gatech.instructure.com/courses/90726/assignments/353746)	
	Lab 3 Quiz 1 (https://gatech.instructure.com/courses/90726/assignments/353748)	
	Lab 5 Quiz 2 (https://gatech.instructure.com/courses/90726/assignments/353750)	
	Lab 6 Quiz 3 (https://gatech.instructure.com/courses/90726/assignments/353752)	
	Lab 7 Quiz 4 (https://gatech.instructure.com/courses/90726/assignments/353754)	
	Lab 8 Quiz 5 (https://gatech.instructure.com/courses/90726/assignments/353756)	
	Public Lecture Clicker (https://gatech.instructure.com/courses/90726/assignments/353758)	
	Test 1 (https://gatech.instructure.com/courses/90726/assignments/353790)	
	Test 2 (https://gatech.instructure.com/courses/90726/assignments/353792)	
	Test 3 (https://gatech.instructure.com/courses/90726/assignments/353794)	
	TurningPoint Total Participation - Berger (https://gatech.instructure.com/courses/90726/assignments/353796)	
	TurningPoint Total Participation - Greco (https://gatech.instructure.com/courses/90726/assignments/353798)	