

PHYS3211: ELECTRICITY & MAGNETISM I

Spring 2025

Instructor:	Dr. Garyfallia Katsimiga
Office:	108 Physics Building
Email:	gkatsimiga@mst.edu
Office Hours:	Mo: 11:30-2:00pm or by appointment

Class Meetings:

- Lec. E & M I (Phys 3211): MoWeFr, 10:00-10:50am (Room:127 Physics Building)

Required Textbook:

- *Introduction to Electrodynamics, 5th Edition*, Author: David J. Griffiths, Publisher: Cambridge University Press, 2024 (ISBN: 978-1-009-39775-9).

Objectives/Course description: Topics covered include among others Coulomb's law, Electric field, Gauss Law and its applications. Electric potential and Poisson's equation. Electrostatic boundary conditions, work and energy. Conductors, induced charges and capacitors. Laplace's equation, the method of images, multipole expansion. Electric field in matter, polarization, displacement, dielectrics and Gauss's law in the presence of dielectrics. Magnetostatics, Lorentz force, Biot-Savart law, Ampère's law. Magnetic vector potential and its multipole expansion.

This course is offered by the UMR Physics Department, Chaired by Dr. Thomas Vojta (vojtat@mst.edu), 102 Physics, Phone: 341 - 4781 under the auspices of the College of Arts and Sciences.

Class Material by Section: During the semester, we will cover most of the Chapters 1–5 of the textbook:

- **Chapter 1–Vector Analysis:** §1.1–§1.5
- **Chapter 2–Electrostatics:** §2.1–§2.5
- **Chapter 3–Potentials:** §3.1–§3.4
- **Chapter 4–Electric Fields in Matter:** §4.1–§4.4
- **Chapter 5–Magnetostatics:** §5.1–§5.4
- **Chapter 6–Magnetic fields in Matter:** §6.1–§6.4

Note that the above schedule is tentative and may be adjusted according to the progress of the class. Additionally, if time permits topics of chapter 6 might also be discussed.

Prerequisites: Physics 2401 (Introduction to Theoretical Physics), helpful if Physics 2135 (Engineering Physics II) has also been completed.

Homework and Exams: In every Physics course, it is extremely important to put your best effort towards solving problems and producing high-quality homework. It is also important to learn how to communicate your physical and mathematical reasoning. There will be homework assignments that have to be submitted in a **pdf format only** in our Canvas page. **Homework exercises will be assigned every Friday, with a deadline for the online submission a week after, namely the consecutive Friday at 10:00am. Late homework will be penalized at a rate of 10% per day, except from cases where accommodation letters have already been provided.**

Of course, struggling through a question in the homework is not something unusual. Physics is all about **study** and **practice** and the only way to learn is for you to work through any difficulties. With that said, and before you make an attempt to solve the homework problems, make sure that you write the accompanying theory down on a piece of paper as many times as possible until you master it. Then, come back to the problems in the homework assignment and attempt to solve them. Such a way of studying will not only help you to create your own study guide but to understand the material in depth. Keep in mind that in order for you to get the best grade that you can, the first step is to do every assignment to the fullest extend of your ability. However, if you still need help, I strongly encourage you to make use of my office hours.

There will be **two midterm exams**, i.e. Exam 1 and Exam 2, and **one cumulative final exam**. For their schedule, consult the below given “Important Dates” section. Before **the exams**, I will run review sessions one for each exam according to:

Review session # 1 for Exam 1 Date to be announced
 Review session # 1 for Exam 2 Date to be announced
 Review session # 1 for Final Date to be announced

In all review sessions, I will solve practice problems, including in homework questions. **Note that all students must take the regular exam!** Only **qualified** students can take an official make-up exam.

Make-Up Exam Policy. Make-ups for mid-semester exams are scheduled on the day preceding the exam. You may request a make-up exam if you have a documented and valid reason for missing an exam.

Exam/Class Conflict: If you have two exams scheduled during the same time period, or a class during our scheduled exam, you are eligible for a make-up exam. You must notify me per email at least two weeks before the scheduled exam.

Religious Observance: In the case of absence from an exam due to religious observance, please make sure that you provided the specified notification at the beginning of the semester.

Medical Reasons: If you will be absent from an exam due to medical reasons, you should notify me at least one week in advance of the exam. If you have a medical emergency, you should inform me as soon as possible.

Note that there is no re-taking of exams in this course. If you are sick and take the exam anyway, you cannot re-take the exam later for a better grade. Regardless of the situation, if you do not feel you can take the exam on the scheduled date notify me by email immediately. Once you take the exam, there is nothing that can be done to change the grade. Additionally, make-up exams will not be given to accommodate travel plans.

Grading Policy and Exams: Your final grade in this course is computed according to:

Homework	100 points
Exam 1	100 points
Exam 2	100 points
Final Exam	200 points
Total	500 points

Course Letter-grade Scale:

A	B	C	D	F
450-500	400-450	350-400	300-350	< 300

Important Dates:

Exam 1 Wednesday, February 26, (Room 127, 10:00-11:00am)
 Exam 2 Wednesday, April 9, (Room 127, 10:00-11:00am)
 Holiday - Martin Luther King Jr. Recognition Monday, January 20
 Spring Recess Thursday 8:00am-Monday 8:00am, March 13-17
 Spring Break Sunday 8:00am-Monday 8:00am, March 23-31
 Last day of classes Friday, May 9
 Final Exam Monday, May 12, 12:30pm-2:30pm (Location: TBA)

Please also use the following link for updates regarding the final exam dates: <https://registrar.mst.edu/media/administrative/registrar/documents/calendars/2025/SP25final examschedule.pdf#241028035718> and also visit the registrar's office webpage to review important dates for the 2024 fall semester via <https://registrar.mst.edu/media/administrative/registrar/documents/calendars/2024/AcademicCalendarAY2024-2025.pdf>

Exams and Class Policies:

- Exams are primarily based on the material we cover in class and homework exercises.
- No formula sheets, class notes and calculators are allowed during midterm and final exams.
- Please go through the cheating and plagiarism procedures by clicking [Honor-Code](#) but also [Student Academic Regulations](#).
- Learning and memorizing formulas takes time. Do not postpone this until the last minute.

Students with special accommodations: The University provides disability-related support services to qualified students. If you have a disability or if you anticipate or experience physical, academic, and/or digital barriers due to a disability, please contact Student Accessibility and Testing at (573) 341-6655, email dss@mst.edu, or visit [Student Accessibility and Testing](#) for more information.

Help Resources: The best way to get help is to attend our classes or to exploit my office hours to resolve open questions. However, there are other resources available too. The Learning Enhancement Across Disciplines (LEAD) program runs Learning Centers and Tutoring which provide efficient means to improve your understanding and increase your mastery of the material you are studying. Discipline-based faculty and undergrad peer instructors operate open-environment learning centers in nearly every foundational course as well as many upper-level courses. You can find the schedule for LEAD learning assistance at [LEAD schedule](#). The Student Success Center (SSC) supports student development through peer Academic Mentoring focusing primarily on STEM courses, peer-to-peer soft skill coaching which can also act as an accountability buddy, and campus programming – all while providing free coffee and hot beverages! All undergraduate students are encouraged to utilize the SSC's free services to get timely support and to enhance their S&T Miner Experience. Contact information at success@mst.edu OR 573-341-7590. To see the course offerings and times for SSC Academic Mentoring, visit [SSC mentoring](#). Finally, all enrolled S&T undergraduate students can receive complimentary FREE tutoring assistance from peers who have successfully completed the course, available round the clock. You have the option to connect via the Knack platform online or in person on campus. For more information please visit [Knack mentoring](#).

Diversity and Inclusion: I am fully committed to an academic environment that is free of bias against any group and I firmly believe in the value of diversity in people and ideas. My ultimate goal is to establish that this class is a welcoming environment to every-one regardless of gender identity, sexual orientation, race, ethnicity, or religious identity. The University and I do not tolerate discrimination. Please feel comfortable coming to me or an administration if at any point you ever feel uncomfortable for any reason. It is important to know that Missouri S&T is committed to the safety and well-being of our campus community, and to creating an environment free from discrimination and harassment. The University prohibits discrimination and harassment on the basis of race, color, national origin, ancestry, religion, sex, pregnancy, sexual orientation, gender identity, gender expression, age, disability, protected veteran status, and any other status protected by applicable state or federal law. As used in this policy, the word "sex" is also inclusive of the term "gender." Additionally, US Federal Law Title IX states that no member of the university community shall, on the basis of sex, be excluded from participation in, or be denied benefits of, or be subjected to discrimination under any education program or activity. Sexual harassment violations of this law include quid pro quo, hostile environment, sexual assault, dating/domestic violence, and stalking. The U.S. Department of Education has stated the prohibition on discrimination on the basis of sex includes sexual orientation and gender identity. Students who are experiencing pregnancy or pregnancy-related conditions, including the birthing parent and non-birthing parent, have rights protected under Title IX. Students should contact the Office of Equity and Title IX to learn more about their rights and pregnancy-related assistance/accommodations provided by the University to ensure equitable access to University educational programs and activities. In accordance with the University of Missouri's Collected Rules and Regulations, all faculty and staff are required to report any information concerning discrimination disclosed through communication including, but not limited to, direct conversation, email, social media, classroom papers and homework exercises to the Equity Officer/Title IX Coordinator.

For more information regarding support for those that have been impacted or to report an incident of discrimination or harassment as defined by [Chapter 600](#) of the University's Collected Rules and Regulations, visit the Office of Equity and Title IX or visit their website at [Equity and Title IX](#). **Office of Equity and Title IX Equity Officer and Title IX Coordinator: Dr. Paul Hirtz Phone: (573) 341-7734, Location: 900 Innovation Drive, Suite 500, E-mail: equity@mst.edu**

Student support and well-being: Student Support and Community Standards is your guide during your time at S&T. You or a friend may need help navigating their student experience, facing a barrier, or experiencing a challenge. Student Support has a dedicated team and numerous resources such as [UCARE](#), housed within the Division of Student Success, and the [Student Emergency Fund](#), that aim to help you navigate the S&T experience and support your success. This includes support to address barriers related to academic, personal, emotional, medical, financial, or any other

needs. All students can learn and grow from challenges or setbacks, they are stepping stones to success and we are here to help.

Respiratory Illnesses including COVID-19 Compliance, Classroom, and Campus Safety:

The University is committed to protecting the health and safety of the campus community. Taking preventative steps, as well as monitoring your health and staying home if you are feeling unwell, will help protect the entire campus community. You can have a look at the University's Health services in <https://studenthealth.mst.edu>.