



SYLLABUS

COLLEGE OF SCIENCE AND MATHEMATICS

DEPARTMENT OF PHYSICS, CSM

PHYS 2212: PRINCIPLES OF PHYSICS II

FALL 2024

Course Information

Class meeting time: *TR 12:30 - 1:45 pm*

Modality and Location: *Academic Building, Room 203 (in-person)*

Recitation time: Section 58 - *Tuesday 2:00 – 2:45 pm @ Atrium Building, Room 212 (in-person)*

Section 59 - *Thursday 2:00 – 2:45 pm @ Atrium Building, Room 212 (in-person)*

Section 60 - *Tuesday 3:30 – 4:20 pm @ Atrium Building, Room 132 (in-person)*

Section 61 - *Thursday 3:30 – 4:20 pm @ Atrium Building, Room 132 (in-person)*

Instructor Information

Name: Dr. Karunananda Pemasiri

Email: kpemasir@kennesaw.edu

Office Location: Crawford Lab Building - Room E130

Office Phone: 470-578-3431

Office Hours: *MWF @ 10:00 – 11:00 am and TR @ 11:00 am – 12:00 pm or by appointment*

Preferred method of communication: *email* (Do not email through D2L)

Course Description

Prerequisite: *Grades of "C" or better in MATH 2202, and PHYS 2211*

This course is an introductory calculus-based course on electromagnetism, Wave optics, and introduction to quantum physics. The student will be able to apply the concepts of electric field and electric potential to problems in electrostatics and with electric currents, describe the motion of charged particles in magnetic fields and induction, explain the origin of electromagnetic waves and properties of light, determine the behavior of light waves passing through single or multiple slits, and understand elementary principles of quantum physics.

Course Materials

Required Texts: Physics for Scientists and Engineers with Modern Physics, Serway and Jewett, 10th ed. (Access to WebAssign will also provide access to eBook)

PHYS 2211/2212 is part of a textbook program called Day One Access. Prior to classes starting, you should have received an e-mail from the KSU bookstore (dayone@kennesaw.edu) with pricing and your personalized link to opt out (please check your junk folder if not in your inbox). You will also receive one on the first day of class and then a reminder email the day prior to the opt-out deadline.

You will access the eBook or courseware through D2L on the content tab.

The purpose of Day One Access is to make sure that you have access to the digital course materials on the first day of class at a highly competitive rate. Everyone enrolled in the course will automatically have access to the digital course materials through drop/add. Your Owl Express account has already been charged for these materials, and you will have through the drop/add to opt-out and receive a refund. Should you opt out, the refund will be processed but will lose access to the materials. Please check your email for the link to opt-out if you choose to do so. The opt-out deadline is August 16th, 2024 at 11:59 pm.

Please note, should you opt-out you will need to purchase your required materials directly from the publisher or other sources.

Technology requirements: A scientific calculator with basic scientific calculations is required. A cellphone cannot be used as a scientific calculator.

Learning Outcomes

After completion of this course, students will be able to:

1. Recall and apply vectors, forces, and energy to approach problems in electromagnetism.
2. Analyze and solve electromagnetic problems using pictorial, graphical, physical, or mathematical representations (including calculus and vectors).
3. Use principles of physics, algebra, and calculus to solve problems in electromagnetism symbolically and numerically.
4. Use integrals and differential equations to represent a physical situation in involving electrodynamics and electrostatics.
5. Explain the wave and particle nature of electromagnetic fields.

Course Structure

In this class, I will employ an effective and proven teaching methodology known as "Active Learning". Through a combination of interactive lectures, problem-solving recitations, homework assignments, quizzes, and exams, students will engage in a dynamic learning process that reinforces theoretical concepts and strengthens practical application.

1. Lectures: The course will consist of 15 weeks of interactive lectures that will cover fundamental theoretical concepts and real-world applications related to course topics. Active participation of the students is encouraged through discussions, polls, and group activities. To prepare for each class, you will be required to read, or watch assigned materials in advance. This will provide a foundation for the discussions and activities in the class.

2. **Problem-Solving Recitations:** In addition to lectures, there will be problem-solving recitation sessions held every week throughout the course where students work in groups. These sessions will provide students with the opportunity to work on challenging problems related to the lecture material. Students will be guided through the problem-solving process and offer personalized assistance.
3. **Homework Assignments:** There will be homework assignments throughout the course, designed to reinforce concepts taught in lectures. Homework will consist of both theoretical questions and practical exercises.
4. **Unannounced Quizzes:** Throughout the course, there will be unannounced quizzes during class sessions. These quizzes may cover the assigned readings, as well as the material discussed in the current lecture or previous lectures. They serve to assess your understanding and encourage continuous engagement.
5. **Unit Exams:** The course will include three comprehensive unit exams. These exams will cover material covered during specific periods of the course, including lectures, recitations, and homework. These exams will test both theoretical knowledge and problem-solving skills.
6. **Final Exam:** The final exam will be comprehensive, covering all material covered throughout the course. This exam will assess students' understanding of the entire course content and their ability to apply concepts to new scenarios.

Course Requirements and Assignments

Homework:

Homework assignments and homework grading will be done through the WebAssign on-line homework tool (<https://www.webassign.net>). There will be homework each week. Homework must be submitted on or before the due date. No late submission is accepted as solutions will be posted through WebAssign after the due date.

You may discuss the homework problems with each other, and I encourage discussions among students. The solutions that you submit must be entirely yours and in your own words with detailed explanations if necessary. If you use the internet as a guide, please cite those websites. Any copied or plagiarized work will receive a zero.

Exams: You will be given three-unit exams (lowest score will be dropped) and a comprehensive final exam. These exams will be closed book examinations. You are allowed to bring one page of the equation sheet for the unit exams, and for the final exam. There will be no make-up exams for unit exams. If a unit exam is missed, that will be the exam score that is dropped.

Unit Exam 1 - *September 10th, 2024*

Unit Exam 2 – *October 8th, 2024*

Unit Exam 3 – *November 5th, 2024*

Final Exam – *December 5th, 2024*

Do not make any plans that might conflict with the final exam. The mandatory final exam **will not** be individually rescheduled to accommodate any other plans.

Important Dates:

Last day to drop/Add: *11:45 pm on August 16th, 2024*

Last day to withdraw without Academic Penalty: *11:45 pm on October 25th, 2024*

Evaluation and Grading Policies

Component	Weight	Note
Recitations	10%	(lowest will be dropped)
Homework Assignments	20%	(lowest will be dropped)
Quizzes	5%	(lowest will be dropped)
Unit Exams	40%	(closed-book, lowest will be dropped)
Final Exam	25%	(closed-book)

GRADING SCALE:

90%	-	100%	A
80%	-	89%	B
70%	-	79%	C
60%	-	69%	D
0%	-	59%	F

I will round up grades if they are ≥ 0.9 ; for example, 89.1 is an A, but 89.0 is a B.

Course Policies

Attendance Policy: Your active, engaged participation in each class period contributes to the learning experience. To ensure that you learn well and perform well, please arrive on time and prepared, remaining until class is over.

Homework Policy: You MUST turn in your homework through WebAssign by the deadline. No late submission is accepted as solutions will be posted through WebAssign after the due date. However, extensions for assignments can be granted but with a penalty. There will be a 2% deduction for each day an assignment is submitted late from the original due date, for a maximum of five days. No extensions will be granted beyond five days without a valid reason supported by documentary evidence.

Email Policy: If you have questions or concerns about our course, please send your messages to kpemasir@kennesaw.edu. I will do my best to respond within 24 hours Monday-Friday. While I will also respond to messages sent through the D2L email client, it may take longer for me to respond. If you prefer to communicate in person, you may visit me during our regularly scheduled office hours.

Exam Policy: Use of a basic scientific calculator is allowed during examinations. All other electronic devices like mobile phones, laptops, tables are not allowed to be used during the examination. No make-up examinations will be scheduled on an individual basis. If you missed a unit exam, that will be the unit exam grade that will be dropped from the final grade calculation. Do not make any plans that might conflict with the final exam as it will not be individually rescheduled to accommodate any other plans.

AI Use Prohibited:

You are expected to generate your own work in this course. When you submit any kind of work, you are asserting that you have created it completely on your own unless you indicate otherwise using quotation marks and proper citation for the source(s) you used to help you. Submitting content that has been generated by someone other than you, or that was created or assisted by an AI generative tool is cheating and constitutes a violation of the KSU Code of Academic Integrity.

Institutional Policies & KSU Student Resources

This link contains information on Institutional Policies and help and resources available to students: [KSU Student Syllabus Resources](#)

CARE SERVICES

Any student experiencing financial hardship and believes this may affect their academic success is urged to complete an Emergency Assistance Application with CARE Services. The Emergency Assistance Program supports students in overcoming unforeseen hardships hindering their academic progress. For help, go to [Emergency Assistance](#) or email emergencyassistance@kennesaw.edu.

Course Schedule

Week	Date	Tentative Topics (subject to minor changes*)
1	Day 1 – 13 th Aug 2024	Introduction, Electric Charges & Conduction & Induction of charges (CH 22.1 – 22.2)
	Day 2 – 15 th Aug 2024	Coulomb’s Law & Electric fields (CH 22.3 - 22.6)
2	Day 1 – 20 th Aug 2024	Electric Field of a Continuous Charge Distribution (CH 23.1 – 23.2)
	Day 2 – 22 nd Aug 2024	Electric Flux, Gaussian Surfaces & Gauss’s Law (CH 23.2 – 23.4)
3	Day 1 – 27 th Aug 2024	Electric Potential & Potential Difference (CH 24.1 – 24.2)
	Day 2 – 29 th Aug 2024	Electric Potential & Electric Field and Conductors (CH 24.3 – 24.6)
4	Day 1 – 03 rd Sep 2024	Capacitors & Capacitance (CH 25.1 – 25.2)
	Day 2 – 05 th Sep 2024	Capacitor Combinations, Energy Stored in a Capacitor and Dielectrics (CH 25.3 – 25.5)
5	Day 1 – 10 th Sep 2024	Unit Exam 1 (on topics covered in chapters 22 - 25)
	Day 2 – 12 th Sep 2024	Electric Dipoles (CH 25.6 – 25.7), Electric Current and Resistance (CH 26.1 – 26.2)
6	Day 1 – 17 th Sep 2024	Drude’s model, Resistance & Temperature, and Superconductors (CH 26.3 – 26.6)
	Day 2 – 19 th Sep 2024	DC Circuits, Electromotive force, Kirchhoff’s Rules (CH 27.1 – 27.3)
7	Day 1 – 24 th Sep 2024	Kirchhoff’s Rules & RC Circuits (CH 27.3 – 27.4)
	Day 2 – 26 th Sep 2024	Magnetic fields, Magnetic force & Particle moving in a magnetic field (CH 28.1 – 28.3)
8	Day 1 – 01 st Oct 2024	Magnetic force on a current carrying wire, Torque & magnetic moment of a current loop (CH 28.4 – 28.6)
	Day 2 – 03 rd Oct 2024	Sources of Magnetic Fields, The Biot-Savart Law (CH 29.1 – 29.2)
9	Day 1 – 08 th Oct 2024	Unit Exam 2 (on topics covered in chapters 26 - 28)
	Day 2 – 10 th Oct 2024	Ampere’s law (CH 29.3 – 29.4)
10	Day 1 – 15 th Oct 2024	Gauss’s Law in Magnetism & Magnetism in Matter (CH 29.5 – 29.6)
	Day 2 – 17 th Oct 2024	Faraday’s law of Induction and Motional e.m.f. (CH 30.1 – 30.3)
11	Day 1 – 22 nd Oct 2024	Lenz’s law, General form of Fraday’s law and Eddy currents (CH 30.4 – 30.6)
	Day 2 – 24 th Oct 2024	Self-Induction, Inductance & RL Circuits, Energy in Magnetic fields (CH 31.1 –31.3)
	Day 1 – 29 th Oct 2024	Mutual Inductance, LC Circuits & RLC circuits (CH 31.3 – 31.6)

12	Day 2 – 31 st Oct 2024	Resistors, inductors & capacitors in AC circuits (CH 32.1 – 32.4)
13	Day 1 – 05 th Nov 2024	Unit Exam 3 (on topics covered in chapters 29 - 31)
	Day 2 – 07 th Nov 2024	Power in AC circuits and RLC circuit (CH 32.5 – 32.7)
14	Day 1 – 12 th Nov 2024	Maxwell's Equations, Electromagnetic Waves & EM Spectrum (CH 33.1 – 33.7)
	Day 2 – 14 th Nov 2024	Wave Optics, Interference & Diffraction Patterns (CH 36 & CH 37)
15	Day 1 – 19 th Nov 2024	Photoelectric effect, Compton effect & Blackbody radiation (CH 39.1 – 39.3)
	Day 2 – 21 st Nov 2024	Wave nature of particles & Heisenberg's Uncertainty (CH 39.4 – 39.8)
25 th Nov 2024 – 01 st Dec 2024		Fall Break (No classes)
Thursday, December 5th, 2024		Final Exam (1:00 – 3:00 pm)

*Please be aware that the syllabus may undergo slight modifications based on how it progresses in alignment with students' learning experiences. However, there will be no changes to the examination dates.