KENNESAW STATE UNIVERSITY

SYLLABUS

COLLEGE OF SCIENCE AND MATHEMATICS

DEPARTMENT OF PHYSICS

PHYS1112L: INTRODUCTORY PHYSICS II LABORATORY

PHYS2212L: PRINCIPLES OF PHYSICS II LABORATORY

SPRING 2024

Instructor

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Office hours - Tuesday 3:00pm – 4:00pm and by appointment.
Office – SC 439

Communication

All communication will be via your student email address or D2L. Students are expected to check D2L for announcements regularly (i.e. at least once or twice a day.) When emailing me, include "PHYS 1112L" or "PHYS2212L" in the subject line. Announcements and grades will be posted on D2L.

Course Overview

This is an introductory laboratory for the algebra-based/calculus-based course on electromagnetism, optics, and modern physics. The student will be able to:

- perform measurements of potential differences, using oscilloscopes and digital multi-meters,
- determine parameters of periodic electromagnetic signals,
- perform measurements of electric and magnetic fields, and electromagnetic induction,
- test the laws of DC and AC circuits,
- study the laws of reflection, refraction and diffraction,
- determine fundamental physics constants by studying elementary quantum phenomena.

Graphical techniques and least squares fits will also be applied.

Learning objectives

After completion of this course, students will be able to:
1. Use digital devices and apparatuses to perform measurements of electric and magnetic fields, voltage, and current.
2. Collect data and respective uncertainties and compare them to the theory.
3. Employ tools and methods for data/theory visualization and extract relevant information from data vs theory plots/graphs.
4. Describe, construct, and analyze simple DC and AC circuits.
5. Describe the wave-particle Properties of light using geometrical and physical optical systems.

Required lab manual

Physics II Laboratory Manual, Electricity, Magnetism, and Optics (2023) by R.S. Patrick. Publisher: Tavenner. ISBN: 9781642202366

Other required material

Calculator with trig functions, exponentials, and logarithms. Pen and pencil. Eraser. Graph paper (10 square/cm or 20 squares/inch).

Corequisite

Credit or enrollment in PHYS 1112/ PHYS 2212

Course modality

This is an in-person laboratory course. It is important that you read the procedure in the lab manual PRIOR to coming to the lab. There will be 10 in-person laboratories. Students may work in groups of no more than 4 students. Every member of a group will turn in their individual report with the names of the group members clearly printed on the cover page. **It will not be possible to change your group during the semester for any reason.**

Grading policy

Your grade will be determined by your grades on the laboratory reports. There will be 10 labs this semester and the lowest lab grade will be dropped.

Grading Scale	
Letter Grade	**Numerical Score**
A	90%-100%
B	80%-89%
C	70%-79%
D	60%-69%
F	less than 60%

Lab reports

Lab reports are to be turned in by the next lab period, at the beginning of the next lab session. Every member of a group will turn in their individual report with the names of the group members clearly printed on the cover page. Failure to fill out the lab partner list will result in a 5% deduction from the lab score. After each lab experiment section, students are required to show their collection of data and get the signature of the instructor before leaving the lab. Students might have the option to submit their final work at the beginning of the next lab. Students are allowed to complete their lab report at home.

Important:

1. All lab reports taken home are due at the beginning of the next lab period and will be counted as late any time after that. Late reports will be accepted with a 50% penalty (See Late lab report policy below).
2. All lab reports taken home must be signed (with initials) by the lab instructor prior to the beginning of the experiment.

No lab reports taken home from the lab room and subsequently submitted without the lab instructor's initials will be accepted for credit. There will be no exceptions to this policy. Lab reports are to be submitted on the data sheets that are contained in the Lab Manual. The top portion of those sheets include a line for a list of lab partners. For any lab experiments that require multiple pages to be submitted, those pages must be properly joined together with either a paperclip or a staple.

Important:

1. All tables should be labeled and titled properly with appropriate units.
2. All graphs should be labeled and titled properly with appropriate axis labels.

Late lab report policy

Lab reports turned in late are subject to a penalty
On time – 100% of earned grade
Up to one week late – 50% of earned grade
More than one week late: 0%

Course policies

Attendance - Regular lab attendance is essential for success in this class.

Late Arrival - Students arriving at the lab later than 15 minutes after lab has started will not be permitted in the lab, and the grade for that lab will be a zero.

Absences - There will not be any make-up labs at the end of the semester. If a lab is missed, that will be the lab grade that is dropped. If you are unable to attend a lab due to a family emergency or sickness, you may contact the instructor for a make-up opportunity after showing proof of absence.

Safety - Everyone must read and sign the Safety Instruction Sheet for the Laboratory. (Last two pages of the lab manual). For safety reasons, students should wear closed-toed shoes. Do not come to the lab room wearing flip-flops or sandals. Failure to follow safety protocols outlined in the laboratory manual may lead to dismissal from laboratory for that day and a grade of zero for that lab.

Computations and Graphs - Put calculations on a separate sheet of paper and turn in the calculation sheet along with the completed data sheet. Read the graphing section carefully in the lab manual (Introduction, "Graphs and Graphing Techniques" section, pp. I-10 to I-13). Use correct graph paper: 10 square/cm or 20 squares/inch. Some sample sheets are provided in the back of the lab manual. Excel plotting is acceptable if all graphing criteria are met.

Electronic Devices - Cellular telephones, pagers, and similar devices must be turned off or placed in silent mode during lab. Use of cell phones should be restricted to emergencies.

Lab conduct - During lab experiments, avoid loud conversation and other disruptions that distract other students. Rude and disrespectful student behavior will not be tolerated (administrative actions will be taken).

Data sheets

Each student is responsible for taking their own data and performing calculations. Each data sheet should be signed by the lab instructor before leaving the lab. If you are unable to complete all data collection by the end of the laboratory period, then you will be given some data to complete the report, with a 10% deduction on your lab report. It is very important that you read the lab procedure prior to coming to the lab.

Face Covering

Based on guidance from the University System of Georgia (USG), masks are encouraged based on individual preference and assessment of personal risk. Disposable face coverings can be picked up at the Office of Emergency Management at Chastain Pointe on the Kennesaw campus and Norton Hall Police Precinct on the Marietta campus. Please email oem@kennesaw.edu if you have questions.

Academic integrity

Every KSU student is responsible for upholding the provisions of the Student Code of Conduct, as published in the Undergraduate and Graduate catalogs. The Student Code of Conduct addresses the University's policy on academic honesty, including provisions regarding plagiarism and cheating, unauthorized access to university materials, misrepresentation/falsification of university records or academic malicious/intentional misuses of computer facilities and/or services, and misuse of student identification cards. Copying sections of someone else's lab report, even your lab partner, is plagiarism. Incidents of alleged academic misconduct will be handled through the established procedures of the Student Conduct and Academic Integrity department, which includes either an "Informal" resolution by a faculty member, resulting in a grade adjustment, or a formal hearing procedure, which may subject a student to the Code of Conduct's minimum one semester suspension requirement. See also https://web.kennesaw.edu/scai/content/ksu-student-code-conduct.

Students with disabilities

Any student with a documented disability or medical condition needing academic accommodations of class-related activities or schedules must contact the instructor as early in the semester as possible. This applies to accommodations for medical conditions related to COVID-19. Written verification from the KSU Student Disability Services (https://sds.kennesaw.edu/) is required. No requirements exist that accommodations be made prior to completion of this approved University documentation. All discussions will remain confidential.

Lab safety guidelines

The Biology and Physics Departments are committed to providing a safe environment for all. However, laboratory safety is a mutual responsibility and requires full participation and cooperation of all involved persons - students, faculty and staff. The following Lab Safety Guidelines have been established for your protection as Faculty, staff or student in the Biology and Physics Department. These guidelines are a part of the Chemical Hygiene Plan and will be rigidly and impartially enforced. Noncompliance may result in a grading penalty and/or dismissal from lab, or termination of employment.

1. Safety glasses must be worn in the lab when safety precautions for the activity require it. In general, if anyone using glassware, heat, sharps, projectiles and/or hazardous materials, or any other activity that may cause injury to the eye, everyone in the room is required to where safety glasses. This is the policy of Kennesaw State University, a state requirement and an OSHA requirement. The glasses must be of the impact protection type with splash guards and must meet ANSI Z87.1 specifications. Other eye/face protection may be required with specific procedures.
2. Contact lenses are discouraged. The safety of wearing contact lenses in laboratories has been hotly debated over the last several years. Both the ACS and OSHA have issued statements indicating that contact lenses can be worn if and only if proper protective eyewear is also worn. The Biology and Physics Department recognizes that some eye conditions require contacts for certain vision correction therapies. However, students who choose to wear contacts must recognize the inherent increased risks - they are difficult to remove if chemicals get in the eye, they have a tendency to prevent natural eye fluids from removing contaminants, and sudden displacement can cause visual problems that create additional hazards. Soft contact lenses are especially problematic because they can discolor and also absorb

chemical vapors causing damage before the wearer is alerted to the problem. If you choose to wear contacts, please tell your lab instructor.

3. Appropriate gloves will be provided when needed. Use of gloves is required for handling chemicals, microorganisms and chemically preserved specimens.
4. Remove your gloves and wash your hands before exiting the lab room. Do not wear your gloves in the hallway.
5. Particle filter masks are to be worn when prevention of inhalation is recommended or required.
6. Appropriate clothing is required. Your clothing is a barrier between your skin and chemicals. No bare midriffs or shoulders. It is strongly recommended that you wear pants to protect your legs. Knee length shorts and dresses are acceptable but not recommended. However, anything above the knee - shorts, skirts, or dresses are not allowed. Lab coats are recommended and can be purchased from the bookstore or other sources.
7. Shoes must be worn. No sandals, open toed or open heeled shoes.
8. Secure loose clothing and long hair when working with equipment, open flame, any chemicals or biological substances.
9. Do not eat, drink (including coffee cups, sport bottles and water bottles), or store food in the labs.
10. Do not apply cosmetics in the lab. You should avoid touching your eyes and mouth in the lab.
11. Smoking or use of other tobacco products is prohibited.
12. Wash hands after working with chemicals and biological agents.
13. It is the recommendation of this department that all students of reproductive age, especially women who have recently conceived, or are anticipating conception during the semester, discuss the course content and reagents with their physician if they are concerned about reproductive toxins.

General Lab Rules

1. Conduct yourself in a responsible manner in the laboratory at all times.
2. Avoid working in the lab alone. Some procedures are forbidden while working alone. It is best to employ the —buddy system to have someone with you while working in the lab. If necessary, a friend may accompany you with the approval of the lab safety officer.
3. Learn where the safety and first-aid equipment is located. This includes fire extinguishers, fire blankets, and eyewash stations.
4. Read all instructions carefully and plan your work. Understand the experiment and if in doubt, ask.
5. When first entering a lab room, do not touch any equipment, chemicals, or other materials in the laboratory area until you are instructed to do so. Follow the Standard Operating Procedure or lab instructions – Any deviation from this must be in writing and approved beforehand.
6. Treat any equipment with care and respect. Be aware of any related hazard. Do not operate any equipment without proper permission and instruction. Follow the SOP for that equipment.
7. Lab tables should be as uncluttered as possible to allow work space and avoid accidents. Also, keep the aisles clear to prevent tripping over your gear, and so that other people can pass unhampered. Place book bags, pocketbooks, etc. under the lab tables. In some labs, seats or stools are not to be used during labs – individuals need to be mobile to avoid possible spills and are not to place themselves under the edge of the lab bench where chemicals may spill.
8. Leave the lab area clean. Put equipment and chemicals away and wipe off the bench top.

9. Treat chemicals with respect and understand the chemicals you are using. Read the label carefully when removing a chemical from the shelf. Read the Material Safety Data Sheets (MSDSs) before you begin to work with the chemical. MSDS are available in the red binders in each room. Do not remove the MSDSs from the binders. Bring the binder to the Biology office (Room SC308) to request a copy.
10. Always label a culture or chemical with the proper information. Name of item, date made, concentration, your name/initials and class or procedure. Each room has a poster detailing how to create a secondary container label.
11. Use the chemical fume hood to Carry out procedures in which noxious fumes are produce or there is a danger of explosion or when using a concentrated form of a chemical. Do not use a biological safety cabinet/ laminar flow hood for this purpose.
12. When preparing a dilute acid solution, never pour water into concentrated acid; always pour acid into water while stirring constantly. Cool the solution if necessary while mixing.
13. Handle all living organisms used in a laboratory activity in a humane manner. Preserved biological materials are to be treated with respect and disposed of properly.
14. Treat all microorganisms as potential pathogens. Always use sterile (aseptic) technique when handling cultures. Use a biological safety cabinet with potential airborne pathogens.
15. Students are never permitted in the Biology and Physics storage rooms or preparation areas unless given specific permission by their instructor. Research students, faculty and staff are only allowed in areas where authorized.
16. Lab activities require your undivided attention. No loud music or other entertainment allowed in labs. Radios, IPods and other entertainment devices should be played at a low volume so that you can hear what is happening in your surroundings. The use of headphones is prohibited.
17. Biology and Physics lab computers are for laboratory business only.
18. No cellular phone use while you are performing any laboratory activity. It is recommended you keep your cell phone on your person to summon help if needed.
19. Notify the lab safety officer or lab coordinator immediately in case of an accident, no matter how small it seems. Contact information is located in every lab room.

COVID 19

If you are feeling ill, please stay home and contact your health professional. In that case, please email the instructor to say you are missing class due to illness. Signs of illness include, but are not limited to, the following:

- Cough
- Fever of 100.4° F (38° C) or higher
- Runny nose or new sinus congestion
- Shortness of breath or difficulty breathing
- Chills
- Sore Throat
- New loss of taste and/or smell

COVID-19 vaccines are a critical tool in “Protecting the Nest.” If you have not already, you are strongly encouraged to get vaccinated immediately to advance the health and safety of our campus community. As an enrolled KSU student, you are eligible to receive the vaccine on campus. Please call (470) 578-6644 to schedule your vaccination appointment. Information on COVID-19 and university policies related to COVID-19 can be found here: https://coronavirus.kennesaw.edu/ . If you have tested positive for COVID-19, or have been exposed to someone who has tested positive for COVID-19, or had a diagnosis from a doctor

of COVID-19, you should stay at home and self-isolate AND contact the KSU COVID-19 Health Helpline at 470-578-6644 and choose Option 1.

Withdrawal Policy

Students are solely responsible for managing their enrollment status in a class; nonattendance does not constitute a withdrawal. The last day to withdraw without academic penalty is **Tuesday, March 05, 2024**. Additional information can be found at: http://catalog.kennesaw.edu/content.php?catoid=24&navoid=2171#withdrawalfromclasses . This and other important dates can be found on the Academic Calendar, Spring 2024 Academic Calendar - Office of the Registrar (kennesaw.edu).

Shifting Modalities

Please note that the university reserves the right to shift teaching modalities at any time during the semester, if health and safety guidelines require it to do so. Some teaching modalities that may be used are face to face (F2F), Hyflex, Hybrid, or online, both synchronous and asynchronous instruction.

Campus Sexual Misconduct Policy

In accordance with federal and state law including, Title IX of the Education Amendments of 1972 ("Title IX") and Title VII of the Civil Rights Act of 1964 (Title VII), the University System of Georgia (USG), including Kennesaw State University, prohibits discrimination on the basis of sex in any of its education programs or activities or in employment. The USG is committed to ensuring the highest ethical conduct of the members of its community by promoting a safe learning and working environment. To that end, Kennesaw State University follows USG Board of Regents Policy Manual, Section 6.7. See https://equity.kennesaw.edu/titleix/title-ix.php. For help see: https://tellksu.kennesaw.edu/

KSU Codes of Conduct

All students are responsible for knowing the information, policies and procedures outlined in the Kennesaw State University Codes of Conduct. Student Conduct and Academic Integrity (SCAI) includes: the general Student Code of Conduct, the Residential Code of Conduct, and the Code of Academic Integrity.

Copyright Law

It is the responsibility of KSU faculty and students to respect the rights of copyright holders and comply with copyright law. The University System of Georgia recognizes that the exclusive rights of copyright holders are balanced by limitations on those rights under federal copyright law, including the right to make a fair use of copyrighted materials and the right to perform or display works during face-to-face teaching activities.
The University System of Georgia facilitates compliance with copyright law and, where appropriate, the exercise in good faith of full fair use rights by faculty and staff in teaching, research, and service activities. The University System of Georgia ensure compliance with copyright law in the following ways.

A. The USG informs and educates students, faculty, and staff about copyright law, including the limited exclusive rights of copyright holders as set forth in 17 U.S.C. § 106, the application of the four fair use factors in 17 U.S.C. § 107, and other copyright exceptions.

B. The USG develops and makes available tools and resources for faculty and staff to assist in determining copyright status and ownership and determining whether use of a work in a specific situation would be a fair use and, therefore, not an infringement under copyright law;

C. The USG facilitates use of materials currently licensed by the University System of Georgia and provides information on licensing of third-party materials by the University System; and
D. The USG identifies individuals at the University System and member institutions who can counsel faculty and staff regarding application of copyright law.

Academic Feedback

Institutional Chief Academic Officers will encourage faculty to clarify for students, at the beginning of each course, the basis on which grades will be determined and to provide timely academic feedback as the course progresses (BOR Academic and Student handbook policy 2.18).

Communication Courtesy

All members of the class are expected to follow rules of common courtesy in all email messages, threaded discussions and chats.

Wellbeing at KSU

YOU MATTER at KSU, and your well-being is a priority to us. The transition to college is exciting, but it can cause students to experience stress and feel overwhelmed, leading to other issues. Through counseling, health education, addiction and recovery support, fitness and recreation activities, and access to basic needs, Wellbeing@KSU is here to help you do well and be well. kennesaw.edu/wellbeing ● #WellbeingatKSU

Inclement Weather Policy

During the course of the year, Kennesaw State University may decide to close campus or operate on a delayed schedule in cases of inclement weather. The University will announce campus closures and delayed schedules in several ways. The cell phone number on file with the university will automatically receive KSU Alerts, so make sure your information in OwlExpress is always accurate. An email will also be sent to your university account.
In addition, announcements will be made by a notice on the Kennesaw State University home page.

Protecting Students' Privacy (FERPA)

Students have certain rights to privacy. These rights are mandated by federal policy. Leaving their work in an unsecured area such as outside your office door (unless agreed upon with each student) means that the students' names and grades and possibly social security numbers are accessible to everyone. Additionally, research papers can be taken and used by other individuals. It is recommended that you permit students to retrieve their work from your office if you don't return it to them in class. Information should not be made public in any way in which a student's grades, social security number, or other personal information may be identified. Grade information may be shared with members of the KSU community who also have a legitimate educational interest in student success (e.g. academic advisors or members of the Behavioral Response Team). Faculty may be asked to provide early alert information if there is a concern that a student is at risk, academically or otherwise.
As a member of the Kennesaw State University community of scholars, I understand that my actions are not only a reflection on myself, but also a reflection on the University and the larger body of scholars of which it is a part. Acting unethically, no matter how minor the offense, will be detrimental to my academic progress and self-image. It will also adversely affect all students, faculty, staff, the reputation of this University, and the value of the degrees it awards. Whether on campus or online, I understand that it is not only my personal responsibility, but also a duty to the entire KSU community that I act in a manner consistent with the highest level of academic integrity. Therefore, I promise that as a member of the Kennesaw State University community, I will not participate in any form of

academic misconduct. The Student Handbook contains information regarding Rights Pertaining to Student Records, and FERPA specific details are available on the Registrar's website. Privacy in the Education Process. A key requirement of the formal evaluation process is the protection of individual privacy rights concerning educational grading. The University's online learning system and email system is designed to prevent unauthorized individuals from gaining access to sensitive information or information protected by federal or state law. Consequently, faculty and students are strongly encouraged to only communicate regarding course matters through the University's designated technology learning system.

KSU Web Accessibility Policy Statement

Federal law Section 508 Subsection 1194.22 of the Rehabilitation Act and the Board of Regents (BOR) of the University System of Georgia (USG) Web Accessibility Guidelines require that all web content meet the federal government's accessibility guidelines. As such, KSU complies with USG guidelines.
University accessibility assistance is provided by several offices as noted below. Staff in these offices work to accommodate requests for access or assistance with access as soon as possible in order to either accommodate the request or identify an effective alternative for the requester.

REQUEST FOR	OFFICE	CONTACT NUMBER	CONTACT EMAIL
Student Support Services	Student Disability Services	470-578-2666	studentdisability@kennesaw.edu
Student Technology Assistance	University Information Technology Services	470-578-3555	studenthelpdesk@kennesaw.edu
Third Party Technology Assistance	University Information Technology Services	470-578-6999	service@kennesaw.edu

Students with qualifying disabilities under the Americans with Disabilities Act (ADA) and/or Section 504 of the Rehabilitation Act who require "reasonable accommodation" to complete the course may request those from Office of Student Disability Services. Students requiring such accommodation are required to work with the University's Office of Student Disability Services rather than engaging in this discussion with individual faculty members or academic departments. If, after reviewing the course syllabus, a student anticipates or should have anticipated a need for accommodation, he or she must submit documentation requesting an accommodation and permitting time for a determination prior to submitting assignments or taking course quizzes or exams. Students may not request retroactive accommodation for needs that were or should have been foreseeable. Students should contact the office as soon as possible in the term for which they are seeking accommodation. Student Disability Services is located in the Carmichael Student Center in Suite 267 on the Kennesaw campus or Building A in Suite 160G on the Marietta campus. Please visit the Student Disability Services (SDS) website for more information or call the office at 470-578-2666 (Kennesaw campus) or 470-578-9111 (Marietta campus).

The Federal, BOR and KSU Student Policies can be accessed through the link https://cia.kennesaw.edu/instructionalresources/syllabus-policy.php

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Week #	Dates	Lab #	Title
Week 1	Jan 08-Jan 12, 2024	NO LABS	-
Week 2	Jan 15-Jan 19, 2024	NO LABS	-
Week 3	Jan 22-Jan 26, 2024	Lab 1	Introduction to the Oscilloscope I
Week 4	Jan 29-Feb 02, 2024	Lab 2	Introduction to the Oscilloscope II
Week 5	Feb 05-Feb 09, 2024	Lab 3	The Electric Field Mapping
Week 6	Feb 12-Feb 16, 2024	Lab 4	Ohm's Law
Week 7	Feb 19-Feb 23, 2024	Lab 5	Magnetic Field and EMF Induction
Week 8	Feb 26-Mar 01, 2024	Lab 6	AC Circuits I
Week 9	Mar 04-Mar 08, 2024	Lab 7	AC Circuits II
Week 10	Mar 11-Mar 15, 2024	NO LABS	SPRING BREAK
Week 11	Mar 18-Mar 22, 2024	Lab 8	Reflection and Refraction
Week 12	Mar 25-Mar 29, 2024	Lab 9	Physical Optics
Week 13	Apr 01-Apr 05, 2024	Lab 10	Photoelectric Effect

SPRING 2024 - PHYS1112L - SCHEDULE

First Lab Meeting for each Section:

CRN 15001 PHYS 1112L/01	Monday, Jan 22 2024, 10:10AM-12:05AM	Science-226
CRN 15002 PHYS 1112L/02	Wednesday, Jan 24 2024, 10:10PM-12:05PM	Science-226
CRN 15070 PHYS 2212L/53	Friday, Jan 26 2024, 10:10PM-12:05PM	Academic Building-270