PHYS-24100-001
Electricity & Optics (Spring 2025)
Department of Physics & Astronomy, Purdue University

Professor in Charge: Prof. Laura J. Pyrak-Nolte
Office: Room 164, Physics Building
Phone: 494-3005
Email: ljpn@purdue.edu
Office Hours: Wednesdays 1:30 PM – 2:30 PM

1st Lecturer: Laura Urba, M Sc.
Office: Room 290C PHYS
Email: lurba@purdue.edu
Office Hours: Mondays 12:30-1:30 PM

TEXTBOOK:

Physics for Scientists and Engineers, 6th Edition, Volume 2, Tipler and Mosca, Publisher: Bedford, Freeman and Worth, ISBN 1429284587. (Older or used editions are acceptable as all homework is on **Variate** through Brightspace)

I-Clicker Cloud: Use your laptop or phone. On the Brightspace page for this course, please go to content and use the resources/instructions under iClicker Cloud to set-up your account for the course. I-Clicker Cloud will be used starting with Lecture 1.

COURSE STRUCTURE:

The course has two different components: lecture and recitation. The lectures will concentrate on developing an understanding of fundamental concepts, theory, and lecture demonstrations. The recitations will be devoted to developing problem-solving skills. By the end of this course, students will be able:

*to identify the concepts and appropriate theory associated with a problem related to electricity, magnetism and optics and how to obtain quantitative answers using suitable mathematics.

*to apply this process to problem solving involving various natural phenomena, such as those encountered in electrostatics, dc and ac currents and circuits, magnetostatics, magnetic induction, electromagnetic waves, light and optics including both geometric and physical optics

*to apply theoretical approaches and problem solving skills to concrete and practical examples in the course and in future career-related science and engineering activities.

PREREQUISITES:

PHYS 172 and MA 162 are prerequisites for this course. You are expected to have a good understanding of classical mechanics, be able to differentiate and integrate simple functions, and be familiar with vectors, including dot and cross products.

COURSE WEBPAGES:

You can find this syllabus, course announcements, learning center hours and other important resources on the PHYS 24100-001-LEC Brightspace page.

ASSIGNMENTS:

A course calendar is posted on the course webpage in Brightspace under “Content” (see “Course Calendar and Schedule” module). The calendar provides the sections in the textbook to read prior to lecture, weekly due dates for lecture quizzes, recitation quizzes and homework. *You should read the assigned sections in the textbook before watching each lecture*.

LECTURES:

The lecture will be used to introduce new material and will contain a ***quiz***. It will also be your chance to ask questions and to discuss things that you find interesting or hard to understand. Please do not hesitate to, or be shy about, asking questions. Demonstrations and discussions will take place during lectures to illustrate the physics concepts. Students will also learn the theory and theoretical approaches for problem solving in electricity, magnetism and optics. There will be interactive questions during most lectures to help assess learning and teaching as well as a ***quiz***. You will need a laptop or phone to use **I-clicker Cloud** to take the quiz. Each quiz will contain a key idea being covered in the reading material & lecture of that day. There will be no make-up quizzes. However, your three lowest quiz grades will be dropped, so you can miss up to three quizzes without any penalty. During the quizzes, you are allowed/encouraged to confer with neighboring students as you work the quiz. The idea is to provoke you to think more deeply about the material and hopefully learn more.

EXAMS:
There will be two 75-minute evening and final exams. The evening and final exams are multiple-choice and should be able to be completed within 75 minutes by a well-prepared student; note that we're giving you 90 minutes for the 2 evening exams and 2 hours for the final. The final is not cumulative. The times and locations of the evening exams are as follows:

Exam 1: Wednesday, **February 19, 2025** @ 8-9:30 PM Location to be Announced

Exam 2: Wednesday, **March 26, 2025** @ 8-9:30 PM Location to be Announced

All exams are closed book. For the exams you will need a #2 pencil, a calculator, and your student ID. A formula sheet will be given with the exam. The formula sheet is posted on Brightspace. No crib sheets are allowed.

Those with adaptive learner status as certified by the Office of the Dean of Students should use the "Accommodated Testing" module under "Content" to arrange to take the exams at DRC.

Cheaters will be given an F for the exam and will be reported to the Dean of Students.

RECITATIONS:
Students are expected to do homework problems and study for the Recitation ***quizzes***. During Recitation, you will have the opportunity to discuss concepts and approaches to the homework problems. You are expected to attempt all the assigned problems BEFORE attending Recitation, (see see "Course Calendar and Schedule" or "Variate" modules for HW due dates by week). If you are familiar with the problems, then you will benefit more from the discussions in Recitation and Lecture. Quizzes will be given in Recitation every week. There are no make-ups for missed Recitation quizzes; however, your three lowest Recitation quiz scores will be dropped. Your total Recitation quiz score will be normalized at the end of the semester to eliminate discrepancies due to differences in the difficulty level and grading of the quizzes given by the various TAs.

HOMEWORK:
Homework is due every week**.** The homework can be found **under "Content" using the link to "Variate".** There are 14 Homework assignments. The last homework assignment is not worth any points because it is given during quiet week. However, the material will be on the final exam. Each homework problem has randomly generated input values so each student will have a unique answer. Make sure that you use your own input values when solving each problem. To receive credit your answer must be within ± 1% of the correct answer, so you are advised to CARRY AT LEAST 4 SIGNIFICANT FIGURES IN YOUR CALCULATIONS. Problems have a limited number

of attempts depending on the number of possible answers. If you answer correctly within the specified number of attempts and before the specified deadline, you will receive 100% credit.

GRADING POLICY:
There are two evening exams and a final exam. The components of the letter grade and their maximum values are:

Two Evening Exams	200
Final Exam	100
Homework Assignments	100
Recitation quizzes	75
Lecture quizzes	25
TOTAL	**500**

Letter grades will be derived using a curve that has not yet been determined. It is possible to get a D or F in this course. We have no desire to give a certain percentage of C's and D's. We would like for all of you to earn A's.

ALERT: During the semester, you should regularly check that your exam, homework, and quiz grades have been correctly entered into your Gradebook. IT IS YOUR RESPONSIBILITY TO BRING ANY PROBLEMS WITH YOUR ASSIGNED GRADES TO THE ATTENTION OF YOUR INSTRUCTOR IMMEDIATELY, AND TO NOTIFY (ljpn@purdue.edu).

ABSENCES AND EXCUSED GRADES:
There is no way to make up missed quizzes. For exams, the student will be given a make-up exam. For quizzes, unexcused absences from any quiz will be assigned a zero grade; excused absences will receive an EX grade. **You must contact Professor Pyrak-Nolte as soon as possible BEFORE, or in the event of illness (e.g. COVID-19, flu, food poisoning) as soon as possible AFTER being ill, about a missed exam or missed quiz.**

For **exams**, please contact Prof. Pyrak-Nolte to arrange a make-up exam. Make-up exams will be given for any of the following circumstances: (1) illness or medical crisis; (2) personal crisis (e.g., automobile accidents, required court appearance, incarceration, death of a close relative, weather conditions that make it impossible to get to the university); and (3) required attendance at an official Purdue activity (e.g., athletics). Appropriate documents (e.g., a written note from a doctor, with their name and phone number included) may be needed to judge the merit. MISSING THE FINAL EXAM WILL RESULT IN AN INCOMPLETE IN THE COURSE.

USEFUL INFORMATION:
Handouts are provided Brightspace. You can access the web from any PUCC computer.

CHANGING SECTIONS:
You may change your RECITATION section only with the permission of the new Recitation instructor. You must have a good reason to change recitation sections; recitation instructors are under no obligation to accept additional students. Make sure your grades are transferred to your new instructor. Section changes will be allowed only until the first evening exam.

Academic Integrity: *"As a boilermaker pursuing academic excellence, I pledge to be honest and true in all that I do. Accountable together - we are Purdue." (see https://www.purdue.edu/odos/osrr/honor-pledge/about.html)*

CHEATING:
Just don't do it. It is not fair to other students or to you. And it won't be tolerated. If you are willing to put in the effort studying and practicing, you will have no problem earning a respectable grade. Working with other students on your homework is not considered cheating, and, in fact, is encouraged. However, direct copying of another's homework is considered cheating.

If a student is found to be cheating on the homework or quizzes, they will receive a zero for that part of their grade, and possibly F for the course in more serious cases. A student who is caught cheating on an exam will receive an F for the course and be reported to the Dean of Students. In more serious cases the student will be suspended or expelled from the university. The same applies to all other parties involved in cheating.

HELP CENTER:
Help is available in room PHYS 290, which is the Physics Help Center. Hours when the help room is staffed will be posted soon after the semester starts. There is a link to the Help Center hours on the course web page. It will be open during finals week, but only on a limited basis.

Nondiscrimination Statement
Purdue University is committed to maintaining a community which recognizes and values the inherent worth and dignity of every person; fosters tolerance, sensitivity, understanding, and mutual respect among its members; and encourages everyone to strive to reach their own potential. In pursuit of its goal of academic excellence, the University seeks to develop and nurture diversity. The University believes that diversity among its many members strengthens the institution, stimulates creativity, promotes the exchange of ideas, and enriches campus life. More details are available on our course Brightspace table of contents, under University Policies.

CAMPUS EMERGENCY NOTICE
In the event of a major campus emergency, course requirements, deadlines and grading percentages are subject to changes that may be necessitated by a revised semester calendar or other circumstances. Information about changes to the course will be posted in the Announcements section for each course website in Brightspace.

Appendix A: Emergency Preparedness

Prior to attending the first recitation please use the Emergency Preparedness website to find the evacuation route and assembly area, as well as the shelter in place locations for PHYS 114. The website has Building Evacuation Plans (BEPs).

Emergency preparedness is your personal responsibility. Purdue University is actively preparing for natural disasters or human-caused incidents with the ultimate goal of maintaining a safe and secure campus.

*To report an emergency, call 911. To obtain updates regarding an ongoing emergency, sign up for Purdue Alert text messages, view www.purdue.edu/ea.

*There are nearly 300 Emergency Telephones outdoors across campus and in parking garages that connect directly to the PUPD. If you feel threatened or need help, push the button and you will be connected immediately.

*If you hear a fire alarm during class, immediately suspend class, evacuate the building, and proceed outdoors. Do not use the elevator.

*If you are notified during class of a Shelter in Place requirement for a tornado warning, we will suspend class and shelter in an appropriate place (see BEPs).

*If you are notified during class of a Shelter in Place requirement for a hazardous materials release, or a civil disturbance, including a shooting or other use of weapons, suspend class and shelter in the classroom, shutting the door and turning off the lights.

Please review the Emergency Preparedness website for additional information. http://www.purdue.edu/ehps/emergency_preparedness/index.html

Mental Health Statement:

If you find yourself beginning to feel some stress, anxiety and/or feeling slightly overwhelmed, try WellTrack. Sign in and find information and tools at your fingertips, available to you at any time.

If you need support and information about options and resources, please contact or see the Office of the Dean of Students. Call 765-494-1747. Hours of operation are M-F, 8 am- 5 pm.

If you find yourself struggling to find a healthy balance between academics, social life, stress, etc. sign up for free one-on-one virtual or in-person sessions with a Purdue Wellness Coach at RecWell. Student coaches can help you navigate through barriers and challenges toward your goals throughout the semester. Sign up is completely free and can be done on BoilerConnect. If you have any questions, please contact Purdue Wellness at evans240@purdue.edu.

If you're struggling and need mental health services: Purdue University is committed to advancing the mental health and well-being of its students. If you or someone you know is feeling overwhelmed, depressed, and/or in need of mental health support, services are available. For help, such individuals should contact Counseling and Psychological Services (CAPS) at 765-494-6995 during and after hours, on weekends and holidays, or by going to the CAPS office of the second floor of the Purdue University Student Health Center (PUSH) during business hours.