

Physics II (PHY180)

COURSE MEETING TIME AND PLACE:

| Course Section | Meeting Time | Location |
|---------------------|--------------------|----------------------------|
| 180-01 (Lecture) | MWF 10:00-10:50 AM | Synchronous Zoom; SECC 112 |
| 180-91 (Discussion) | T 2:00-2:55 PM | Synchronous Zoom; SECC 112 |

Lecture and Discussion Zoom: <https://wcupa.zoom.us/j/94731820373?pwd=aWE3L1Q2T2RvUTRNNkQ2Ni9RZzEyQT09>

Meeting ID: 947 3182 0373

Passcode: 623538

INSTRUCTOR INFORMATION:

Dr. Tianran Chen

e-mail: tchen@wcupa.edu (please include **PHY180** in the subject line of any e-mail)

phone: (610) 436-3563

office: SECC 358

OFFICE HOURS:

My scheduled office hours as of the first day of class are listed below. I reserve the right to adjust this schedule to reflect unforeseen circumstances. Office walk-in, or Zoom by appointment. See D2L for Zoom meeting info.

| Monday | Tuesday | Wednesday |
|----------------|----------------|----------------|
| 4:00 – 6:00 PM | 3:00 – 5:00 PM | 4:30 – 5:30 PM |

Office hours are available by appointment for students with an ongoing schedule conflict with my scheduled hours.

REQUIRED COURSE MATERIALS:

- **Textbook and Homework System:** Fundamentals of Physics (11th edition) by Halliday, Resnick & Walker (John Wiley & Sons). An e-text of this book is available through the WileyPlus website. This course uses the WileyPlus online platform for readings and homework assignments.
- **Accessing WileyPlus:** You may access Wiley Plus Resources (e-text) and homework assignments via the WileyPlus module on D2L: **D2L > Content > WileyPlus**
- **Inclusive Access:** The WileyPlus platform is not free. You will be directly charged by the University under “Inclusive Access” program. This means you should see \$130.59 charge appear on your Bursar’s account. This is a discounted price. If you took PHY170 last semester, you won’t be charged again. Only students who did not take PHY170 at WCU (Fall 2021 or Spring 2021) will be charged. Questions about Inclusive Access should be directed to: inclusiveaccess@wcupa.edu
- Laboratory Notebook, PHY180 Lab Manual
- Stand-alone calculator

COURSE DESCRIPTION AND STUDENT LEARNING OUTCOMES:

Our goals are to explore, analyze, and investigate the world around us and to gain a better understanding of how and why various physical phenomena occur. In our study of these physical phenomena, we aim to use our mathematical tools to aid us in gaining not only a qualitative conceptual perspective, but to provide a quantitative applied understanding as well.

Course PHY180 is an approved course in the WCU General Education Program. It is designed to help students meet the following General Education goals:

1. **General Education Goal #2: Ability to employ quantitative concepts and mathematical methods:** Virtually every topic discussed in the class will have a quantitative aspect that will require advanced mathematics (calculus). These methods will be employed during class examples, recitation quizzes, midterm exams, and laboratory sessions.
2. **General Education Goal #3: Ability to think critically and analytically:** New concepts will be presented each week that build upon previously discussed material. The relationships and connections between the concepts will require students to think critically and analytically about the reason the physical phenomena occur and how they occur. Critical and analytical thinking are essential for applying these interconnected yet seemingly diverse concepts to efficiently solve homework and exam problems.

Prerequisite: MAT 161 (Calc I), MAT 162 (Calc II), PHY 170 (Physics I).

EXPECTATIONS:

This is a fast-paced course. If you note the schedule at the end of this syllabus, you will see that we cover approximately one chapter per week. The curriculum of this course is determined in such a manner that you should leave this course with a broad knowledge of a variety of physical phenomena and a better understanding of how to view and approach physical problems. This is the reason most of you have been required by your majors to take this class. For a successful completion of this course, you are not only expected to come to the class regularly, but also take notes, solve the problems assigned in the class, and read the example problems from the textbook. **To keep up with the pace of the course, I strongly recommend that you read the sections in the text indicated in the schedule before you get to class.**

ASSESSMENT:

I will be using the D2L grade-book feature to post course grades. Please check it periodically.

- **Laboratory** (20%): Please see laboratory syllabus for details.
- **Homework** (15%):
Weekly homework assignments labeled “HW#” are typically due at **11:59pm on Thursday**. Assignments labeled “Ch#-practice” are NOT for credit but for additional practice only. All assignments have a clearly labeled due date on WileyPlus. **It is your responsibility to check WileyPlus periodically for assignments.** Answers to all homework problems are available on WileyPlus immediately after the assignment is due. **Because answers are available immediately, late homework will NOT be considered.**
- **Regular Exams** (3×15% = 45%): Four regular exams will be given during the semester. I will keep your highest three scores. **There are NO make-up exams.**
 - **If you miss a regular exam:** If you miss an exam for a **University Sanctioned Event** you must notify me in advance so that we can arrange for you to take the exam in a manner consistent with its integrity. You must also provide some form of documentation (performing arts program, competition schedule etc.) **In all the other cases (ANY type of illness, family emergency, car accident, etc.), a missed exam will be treated as your dropped exam.**
 - **If you have an OSSD letter pertaining to exams:** You are responsible for making the appropriate arrangements at least one week prior to the exam date and time.
 - Regular exam dates are subject to changes (snow days, WileyPlus maintenance, schedule adjustments, etc.). Be available for class days before & after.
- **Final Exam** (20%): The final is cumulative and will require synthesis of concepts from different parts of the course.

The dates and times of the final exams for this course (as set by the registrar) can be found here: <https://www.wcupa.edu/registrar/calendar/documents/2221FinalExamSchedule.pdf>. **You should plan to be available for the entire finals week.** We have in past semesters had to reschedule finals due to weather related events.

I will be using the official WCU scale for grades, see p.48 in the undergraduate catalog. However, I reserve the right to adjust the weights of individual components, or the scale to account for unforeseen circumstances.

In terms of the WCU standard and the courses point system grades are as follows.

| Letter | Grade Points | Percentage | |
|-----------|--------------|-------------|---------------|
| A | 4.000 | 93 - 100 | Excellent |
| A- | 3.670 | 90 - 92 | |
| B+ | 3.330 | 87 - 89 | Superior |
| B | 3.000 | 83 - 86 | |
| B- | 2.670 | 80 - 82 | |
| C+ | 2.330 | 77 - 79 | Average |
| C | 2.000 | 73 - 76 | |
| C- | 1.670 | 70 - 72 | |
| D+ | 1.330 | 67 - 69 | Below Average |
| D | 1.000 | 63 - 66 | |
| D- | 0.670 | 60 - 62 | |
| F | 0.000 | 59 or lower | Failure |

TIME COMMITMENT AND WORK FLOW:

The life of a college student is not easy. A full time student can expect to spend about 50 hrs per week on coursework, or about 12.5 hrs per week per course. Here is how I recommend you spend your 12.5 hours for Physics 130. (Please note some students may need more than 12.5 hrs/week to master the material.)

| Activity | Time Commitment |
|------------------------|-----------------|
| Reading Prior to Class | 1.0 hrs/week |
| Class | 3.5 hrs/week |
| Post Lecture Study | 1.5 hrs/week |
| Homework After Lecture | 3.75 hrs/week |
| Reading Prior to Lab | 0.25 hrs/ week |
| In Lab Time | 2 hrs/week |
| Post Lab Write-Up | 0.5 hrs/week |
| | |
| Total Time Spent | 12.5 hrs/week |

TENTATIVE COURSE SCHEDULE: I reserve the right to modify it as needed over the course of the semester. Please note that if the University is closed (due to snow etc.) for a regularly scheduled lab session we will use one of the weeks marked “No Lab*” to make up the canceled lab sections.

| Date | | Lecture | Reading | Laboratory |
|------|--------|--|------------------|--------------------------|
| M | Jan 24 | Charge Model | 21.1 | NO LAB |
| T | Jan 25 | Quantization and conservation of charge | 21.2 – 21.3 | |
| W | Jan 26 | Coulomb’s Law | 21.1 | |
| F | Jan 28 | The Electric Field I | 22.1, 22.2, 22.6 | |
| M | Jan 31 | The Electric Field II | 22.3, 22.7 | Uncertainty Analysis |
| W | Feb 2 | The Electric Field III | 22.4 | |
| F | Feb 4 | Gauss’ Law I | 23.1 – 23.4 | |
| M | Feb 7 | Gauss’ Law II | 23.5 – 23.6 | Electric Charges |
| W | Feb 9 | Electrical Potential I | 24.1 | |
| F | Feb 11 | Electrical Potential II | 24.2 – 24.3 | |
| M | Feb 14 | Electrical Potential III | 24.6 – 24.7 | Equipotential Lines |
| W | Feb 16 | Capacitance I | 25.1 – 25.3 | |
| F | Feb 18 | EXAM 1: Chapters 21 – 24 | | |
| M | Feb 21 | Capacitance II | 25.4 – 25.5 | NO LAB* |
| W | Feb 23 | Electric Current | 26.1 – 26.2 | |
| F | Feb 25 | Resistance, Ohm’s Law, Power | 26.3 – 26.5 | |
| M | Feb 28 | Circuit I: Single-Loop | 27.1 | Ohm’s Law |
| W | Mar 2 | Circuit II: Multiloop | 27.2 | |
| F | Mar 4 | Circuit III: RC Circuits | 27.4 | |
| M | Mar 7 | Magnetic Fields I | 28.1 – 28.2 | Kirchhoff’s Laws |
| W | Mar 9 | Magnetic Fields II | 28.3 – 28.4 | |
| F | Mar 11 | EXAM 2: Chapter 25 – 27 | | |
| M | Mar 14 | SPRING BREAK | | NO LAB |
| W | Mar 16 | | | |
| F | Mar 18 | | | |
| M | Mar 21 | Magnetic Fields III | 28.6 – 28.8 | RC Circuits |
| W | Mar 23 | Magnetic Fields due to Current I | 29.1 – 29.2 | |
| F | Mar 25 | Magnetic Fields due to Current II | 29.3 | |
| M | Mar 28 | Magnetic Fields due to Current III | 29.4 – 29.5 | NO LAB* |
| W | Mar 30 | Induction I | 30.1 – 30.2 | |
| F | Apr 1 | Induction II | 30.3 – 30.5 | |
| M | Apr 4 | Induction III | 30.6 | EM Induction |
| W | Apr 6 | Electromagnetic Oscillations and AC Circuits | 31.1 – 31.4 | |
| F | Apr 8 | Maxwell’s Equations I | 32.1 – 32.3 | |
| M | Apr 11 | Maxwell’s Equations II | 32.4 – 32.6 | AC Circuits |
| W | Apr 13 | EXAM 3: Chapters 28 – 31 | | |
| F | Apr 15 | Electromagnetic Waves I | 33.1 – 33.2 | |
| M | Apr 18 | Electromagnetic Waves II | 33.4 – 33.5 | NO LAB* |
| W | Apr 20 | Images I | 34.1 – 34.2 | |
| F | Apr 22 | Images II | 34.4 | |
| M | Apr 25 | Interference | 35.1 – 35.2 | Basic Optics |
| W | Apr 27 | Diffraction | 35.3 | |
| F | Apr 29 | Physical Optics | 36.1, 36.3, 36.5 | |
| M | May 2 | Photons, Matter Waves, Debroglie Relations | 38.1 – 38.5 | Interference/Diffraction |
| W | May 4 | EXAM 4: Chapters 32 – 36 | | |
| F | May 6 | Wavefunctions of Electrons, Tunneling Effect | 38.8, 38.9, 39.3 | |
| F | May 13 | FINAL EXAM: 8:00 AM – 10:00 AM | ALL | |

ELECTRONIC DEVICE POLICY:

The pace of the course is such that your undivided attention will be required for the entire lecture and lab period. Please set all electronics to silent or “vibrate mode” and put them away, so that both you and your neighbors will be able to concentrate on the material at hand. No texting or making phone calls is allowed in the classroom.

D2L/WILEY PLUS:

We will be using two online platforms for this course WileyPlus, the publisher’s homework system, and D2L. Homework assignments are to be performed on WileyPlus. To allow for *structured note taking* I will post my lecture slides prior to class. These slides intentionally leave some information, such as example solutions out, and provide space to fill that material in during lecture. **It is your responsibility to check these resources periodically for any updates and announcements.**

ATTENDANCE POLICY:

Attendance is not taken for this course. Attending lecture, however, is highly correlated with success in this course, and I strongly recommend it. This is your chance to ask questions, see examples and get help in solving problems, which will significantly improve your grade. The lab component of this course, however, has a different attendance policy.

DISABILITY STATEMENT:

If you have a disability that requires accommodations under the Americans with Disabilities Act (ADA), please present your letter of accommodations and meet with me as soon as possible so that I can support your success in an informed manner. Accommodations cannot be granted retroactively. If you would like to know more about West Chester University’s Services for Students with Disabilities(OSSD), please contact the OSSD which is located at 223 Lawrence Center. The OSSD hours of Operation are Monday – Friday 8:30 a.m.–4:30 p.m. Their phone number is 610-436-2564, their fax number is 610-436-2600, their email address is osssd@wcupa.edu, and their website is at www.wcupa.edu/ussss/osssd.

ELECTRONIC COMMUNICATIONS STATEMENT:

It is expected that faculty, staff, and students activate and maintain regular access to University provided e-mail accounts. Official university communications, including those from your instructor, will be sent through your university e-mail account. You are responsible for accessing that mail to be sure to obtain official University communications. Failure to access will not exempt individuals from the responsibilities associated with this course.

The subject of your emails to me should contain “**PHY180**”. Any email that does not have the correct headline format may not get my reply in time.

UNIVERSITY SANCTIONED EVENTS:

If you will be participating in a University sanctioned event during class or an exam **you must notify me in advance**. Please see the discussion of University Sanctioned Events in the general catalog.

PHYSICS TUTORING:

Physics tutoring is available through LARC (610) 436-2535. In the past peer tutoring has also been available from SPS (the Society of Physics Students). If SPS tutoring becomes available this semester I will make an announcement. **These should be considered in addition to my office hours, which are the first place you should stop for additional help.**

INTELLECTUAL PROPERTY STATEMENT:

I, the instructor, utilize copyrighted materials under the “Freedom and Innovation Revitalizing the United States Entrepreneurship Act of 2007” (Fair Use Act). Apart from such copyrighted materials, all other intellectual property associated with this course is owned and copyrighted by the instructor, including, but not limited to, lectures, course

discussions, course notes, slides, assessment instruments such as exams, and supplementary materials posted or provided to students authored by the instructor. No recording, copying, storage in a retrieval system, or dissemination in any form by any means of the intellectual property of the instructor, in whole or in part, is permitted without prior written permission of the instructor. When such permission is granted, it must specify the utilization of the intellectual property and all such permissions and waivers shall terminate on the last day of finals of the semester in which this course is held.

ACADEMIC INTEGRITY & CONDUCT

I have a zero tolerance policy for breaches of academic integrity. Breaches of academic integrity will be investigated and sanctions imposed to the full extent available under University policy. For questions regarding the university Academic Dishonesty, the No-Grade Policy, Sexual Harassment, or the Student Code of Conduct, students are encouraged to refer to their major department's handbook, the Undergraduate Course Catalogue, the Rams Eye View, or the University Web Site. Please understand that improper conduct in any of these areas will not be tolerated and may result in immediate ejection from the class.

ALL OTHER ACADEMIC POLICIES

For any university wide academic policy not explicitly covered in this document, such as No Grade policies. Please consult your major advising handbook, the Undergraduate Catalog, the Ram's Eye View, or the University Website.

TITLE IX/REPORTING INCIDENTS OF SEXUAL VIOLENCE

West Chester University and its faculty are committed to assuring a safe and productive educational environment for all students. In order to meet this commitment and to comply with Title IX of the Education Amendments of 1972 and guidance from the Office for Civil Rights, the University requires faculty members to report incidents of sexual violence shared by students to the University's Title IX Coordinator, Ms. Lynn Klingensmith. The only exceptions to the faculty member's reporting obligation are when incidents of sexual violence are communicated by a student during a classroom discussion, in a writing assignment for a class, or as part of a University-approved research project. Faculty members are obligated to report sexual violence or any other abuse of a student who was, or is, a child (a person under 18 years of age) when the abuse allegedly occurred to the person designated in the University protection of minors policy. Information regarding the reporting of sexual violence and the resources that are available to victims of sexual violence is set forth at the webpage for the Office of Social Equity at <http://www.wcupa.edu/admin/social.equity/>.

West Chester University's COVID-19 Classroom Protection Requirements

We, as a community of educators and learners, should work together to create a culture that protects our most precious resource: each other. As such, it is the expectation of all members of the University community to continue to do their part to protect the health and safety of others. In our classrooms where the university's primary function is carried out, the following protocols are being implemented:

- Unless otherwise directed by the faculty member, students must wear a cloth or disposable face mask that covers both the nose and mouth the entire time they are in class.
 - Face shields and gaiters do **not** meet the university's mask requirement.
- Eating and drinking in the classroom are only permitted if they are medically necessary.
 - Please work with the Office of Services for Students with Disabilities to notify the university and your professors of this necessity.

We want you to succeed in this class, but we will have to ask you to leave if you do not follow these guidelines, so please – make the most of this opportunity and help keep our campus safe.

PUBLIC SAFETY

The Emergency Communications Committee recommends that the number of WCU's Department of public safety be available on every course syllabi. WCU Department of Public Safety: (610) 436-3311.