

GENERAL PHYSICS II (PHY 140)

COURSE AND INSTRUCTOR INFORMATION

Course: PHY 140 (General Physics II), **Section:** 01

Lecture Time and Location: MWF: 8:00 am – 8:50 am in **SECC 112**

Discussion Time and Location: Thursday, 10:00 am – 10:55 am in **SECC 213**

Instructor: Anil K. Kandalam (Dr. Kandalam or Dr. K)

Office Location: Science and Engineering Center and Commons (**SECC**), 360

Email: akandalam@wcupa.edu

Office Hours: Monday, Wednesday, Friday: 9:00 am – 10:00 am

Thursday: 8:00 am – 9:00 am, 11:00 am – 12:00 noon OR by appointment

COURSE DESCRIPTION

PHY140 is the second semester of a year-long introductory physics sequence. In PHY130 we discussed the properties of motion arising from mass. PHY140 covers electricity, magnetism, circuits, optics, quantum mechanics, and nuclear physics. A passing grade in PHY130 is the prerequisite for this course. **We will be using concepts from PHY130 on a daily basis as well as a good deal of algebra.**

REQUIRED COURSE MATERIALS & INCLUSIVE ACCESS

Textbook and Homework System: Physics 5/e by Walker with Mastering Physics.

Textbook: An e-text of this book is directly accessible from the course D2L page. This is provided through WCU's ***Inclusive Access Program***. This means you should see \$112.93 charge appear on your Bursar's account. This is a discounted price. You may also upgrade to a physical copy at additional cost.

If you have used/purchased Inclusive Access last semester for PHY130 at WCU: You won't be charged again by the University.

If you Drop the Course: You can opt-out of ***Inclusive Access*** until the **01/31/2022**. **To opt out you must use the link provided in the email sent to your WCUPA email account from the WCU campus store.** If you opt-out before the deadline, you receive a refund. Questions about Inclusive Access should be directed to: inclusiveaccess@wcupa.edu

Modified Mastering Physics: This course uses the online platform Mastering Physics for readings and homework assignments. **You can access the Mastering Physics from the Access Vital Source widget on our D2L course site.** If you experience any technical problems, use the links provided on these instructions to check your computer settings and, if necessary, contact Pearson Support. I recommend that you always use a “real computer” (not a mobile device) and the Mozilla Firefox web browser when working on “Mastering Physics”.

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 gaitors 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.

SPECIFIC COURSE OUTCOMES

Students completing this course will be able to

- Develop a fundamental understanding of principles of electrostatics, electric current, magnetostatics, electromagnetic induction, geometrical and physical optics, and modern physics.
- Apply these concepts in solving numerical problems
- Exercise and develop reasoning and problem-solving skills

EXPECTATIONS

This is a *fast-paced* course. For a successful completion of this course, you are not only expected to come to the class regularly, but also take notes regularly, solve the problems assigned, and read the example problems from the textbook. **In order to keep up with the pace of the course, I strongly suggest you read the sections in the text indicated in the schedule before you get to class.**

D2L

This course has a D2L page. I will post quizzes, lecture slides, announcements, practice problems etc. on D2L.

GRADING

The final grade assessment for this course will be based on the following:

- Lab15%
- Homework14%
- Quizzes 6%
- Exams (3 @ 15% each).....45%
- Final exam.....20%

Letter grades will be assigned on the following scale. However, I reserve the right to adjust the weights of individual components, or the scale to account for unforeseen circumstances.

93 – 100 %	A	73 – 76 %	C
90 – 92 %	A–	70 – 72 %	C–
87 – 89 %	B+	67 – 69 %	D+
83 – 86 %	B	63 – 66 %	D
80 – 82 %	B–	60 – 62%	D–
77 – 79 %	C+	59% or lower	F

LABORATORY

This course has a laboratory component. Your lab grade will be factored into your final grade for this course. Please see the lab syllabus for more details.

HOMEWORK POLICIES

This course will utilize an online homework system via **Modified Mastering Physics**. Homework will be assigned every week, starting from the first week of classes. Typically, the assignments are due by **11:00 PM (EST) on the due date**. No late submissions are allowed. I reserve the right to modify homework frequency and due-dates to reflect unforeseen circumstances. I will not drop any homework grades.

Please remember that you are responsible for completing homework assignments in a timely manner and informing me of problems, if any, in accessing the homework. Failure to complete an assignment because you could not access the homework an hour before it is due is not an excuse.

QUIZZES

There will be a total of **ten** quizzes this term. Each quiz comprises of six concept-based multiple-choice questions that are based on the topics covered during the previous three or four lectures. A tentative list of days on which quizzes will be given can be found in the course schedule section of this syllabus. *You will have 24 hours to complete the quiz after it is posted on D2L.* **But, once you start, you must complete the quiz in 30 minutes.** I will email everyone when the quiz is available on D2L. Please note that I reserve the right to modify the dates on which quizzes are given, as well as the total number of quizzes given, to reflect unforeseen circumstances. Quizzes usually takes approximately fifteen minutes to complete. These quizzes are answered by selecting “*Quizzes*” under “*Assessment*” drop-down menu on the **course D2L page**. I will drop the lowest quiz grade. If you miss a quiz, you will receive a ZERO for it. **No make-up quizzes**. The only exception is for Excused Absences, as outlined in the [Excused Absences Policy](#) contained in the [WCU Undergraduate Catalog](#). Appropriate documentation must be provided.

REGULAR EXAM POLICY

Four in-class exams (closed book) will be given during the semester. Each of these exams will consist of a combination of multiple-choice questions (conceptual and numerical) and open-ended numerical problems for which the students are expected to show all the work (math steps). I will drop the lowest exam grade.

If you miss an exam: If you miss an exam, you will receive a ZERO on that exam. The policy of dropping an exam score is meant to alleviate the need for make-up exam. This means every student has one in-class exam that they can for whatever reason, sickness, family emergency, etc., not be counted. **Therefore, I will not give a make-up exam.** The exceptions, however, are limited to the absences related to University Sanctioned Events (see below). 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).

FINAL EXAM

The final exam (closed book) will include all topics covered (cumulative) in the course and is **MANDATORY**. Final exam will consist of mostly multiple-choice questions (conceptual and numerical) and few open-ended questions. Missing the final exam will result in a zero for the exam unless EXTREME circumstances apply. Even in that case, extra questions will be added to the make-up final. You must bring your university ID to the final exam.

The dates and times of the final exam for this course (as set by the registrar) are:

Monday, May 9, 2022, from 8:00 am – 10:00 am

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.

ATTENDANCE POLICY

A regular attendance to the lectures is an important part of this course and I highly recommend it. This is your chance to ask questions, see examples and get help in solving problems. I am here to guide you through the material. Attendance will benefit your understanding and therefore grade. However, **I do not give an attendance grade**. Students must understand that they are responsible for all material covered and assigned during their absences (excused and unexcused) and that they are responsible for the academic consequences of their absences. The lab component of this course, however, has a different attendance policy. **Please see lab syllabus for lab attendance policy.**

EXECUSED ABSENCES POLICY

If you are participating in a university sanctioned event during one of our scheduled exams you must notify me in advance. You must provide some form of documentation. We can then arrange for you to take the exam in a manner consistent with exam integrity. Students are advised to carefully read and comply with the excused absences policy, including absences for university-sanctioned events, contained in the WCU Undergraduate Catalog. In particular, please note that the “responsibility for meeting academic requirements rests with the student,” that this policy does not excuse students from completing required academic work, and that professors can require a “fair alternative” to attendance on those days those students must be absent from class in order to participate in a University-Sanctioned Event.

CONTACT POLICY

Please include **PHY140** in the subject line of any e-mail. I try to respond to e-mail within 24hrs. Although I will try to answer all questions directed to me by e-mail, most problems related to course content are best discussed during office hours.

E-MAIL POLICY 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.

ACADEMIC & PERSONAL INTEGRITY

It is the responsibility of each student to adhere to the university's standards for academic integrity. Violations of academic integrity include any act that violates the rights of another student in academic work, that involves misrepresentation of your own work, or that disrupts the instruction of the course. Other violations include (but are not limited to): cheating on assignments or examinations; plagiarizing, which means copying any part of another's work and/or using ideas of another and presenting them as one's own without giving proper credit to the source; selling, purchasing, or exchanging of term papers; falsifying of information; and using your own work from one class to fulfill the assignment for another class without significant modification. Proof of academic misconduct can result in the automatic failure and removal from this course. For questions regarding Academic Integrity, the No-Grade Policy, Sexual Harassment, or the Student Code of Conduct, students are encouraged to refer to the Department Undergraduate Handbook, the Undergraduate Catalog, the Ram's Eye View, and the University website at www.wcupa.edu.

COURSE SCHEDULE: A tentative schedule for the course is given below. I will try to follow it as closely as possible. **I reserve the right to modify the schedule as needed over the course of the semester.**

	Date		Lecture and Discussion	Reading	Laboratory
Wk1	M	Jan. 24	19: Electric Charge, Insulators and Conductors	19 – 1, 19 – 2	NO LAB
	W	Jan. 26	19: Coulomb's Law	19 – 3	
	R	Jan. 27	19: The Electric Field	19 – 4	
	F	Jan. 28	Chapter 19: Quiz #1 & Problem Solving		
Wk2	M	Jan. 31	19: Electric Field Lines	19 – 5	Uncertainty Analysis
	W	Feb. 2	19: Electric Flux and Gauss's Law	19 – 7	
	R	Feb. 3	20: Electric Potential and Electric Potential Energy	20 – 1	
	F	Feb. 4	20: Energy Conservation	20 – 2	
Wk3	M	Feb. 7	20: Electric Potential of Point Charges	20 – 3, 20 – 4	Electron Charge
	W	Feb. 9	20: Equipotential Surfaces	20 – 4, 20 – 5	
	R	Feb. 10	Chapter 20: Quiz #2 & Problem Solving		
	F	Feb. 11	20: Capacitors & Electrical Energy Storage	20 – 5, 20 – 6	
Wk4	M	Feb. 14	21: Electric Current, Resistance, and Ohm's Law	21 – 1, 21 – 2	Equipotential Lines
	W	Feb. 16	21: Energy and Power in Electric Circuits	21 – 3	
	R	Feb. 17	Chapter 21: Quiz #3 & Problem Solving		
	F	Feb. 18	Exam I: Chapters 19 & 20		
Wk5	M	Feb. 21	21: Resistors in Series & Parallel	21 – 4	Ohm's Law
	W	Feb. 23	21: Resistors in Series & Parallel	21 – 4	
	R	Feb. 24	21: Circuits Containing Capacitors	21 – 6	
	F	Feb. 25	Chapter 21: Quiz #4 & More Problem Solving		
Wk6	M	Feb. 28	21: RC Circuits	21 – 7	NO LAB
	W	Mar. 2	22: Magnetic field, Magnetic force on point charge	22 – 1, 22 – 2	
	R	Mar. 3	22: Motion of charged particle in magnetic field	22 – 3	
	F	Mar. 4	Chapter 22: Problem Solving		
Wk7	M	Mar. 7	22: Motion of charged particle in magnetic field	22 – 3	Resistors in Series
	W	Mar. 9	22: Magnetic force on a current carrying wire & loop	22 – 4 & 22 – 5	
	R	Mar. 10	22: Magnetic Fields and Ampere's Law	22 – 6	
	F	Mar. 11	Chapter 22: Quiz #5 & More Problem Solving		
	M	Mar. 14	SPRING BREAK		NO LAB
	W	Mar. 16			
	R	Mar. 17			
	F	Mar. 18			
Wk8	M	Mar. 21	22: Current loops and Solenoid	22 – 7	Resistors in Parallel
	W	Mar. 23	23: Induced Electromotive force & Magnetic flux	23 – 1, 23 – 2	
	R	Mar. 24	Exam II: Chapters 21 & 22		
	F	Mar. 25	23: Faraday's Law of Induction and Lenz's Law	23 – 3, 23 – 4	
Wk9	M	Mar. 28	23: Mechanical Energy and Electrical Energy	23 – 5	RC Circuits
	W	Mar. 30	23: Generators & Motors	23 – 6	
	R	Mar. 31	23: Inductance & Energy stored in a magnetic field	23 – 7, 23 – 8	
	F	Apr. 1	Chapter 23: Quiz #6 & Problem Solving		

	Date		Lecture and Discussion	Reading	Laboratory
Wk10	M	Apr. 4	25: Production & Propagation of EM Waves	25 – 1, 25 – 2	EM Induction
	W	Apr. 6	25: The Doppler Effect & Electromagnetic spectrum	25 – 3	
	R	Apr. 7	Chapter 25: Quiz #7 & Problem Solving		
	F	Apr. 8	25. Energy carried by EM Waves	25 – 4	
Wk11	M	Apr. 11	25: Energy and Momentum in EM Waves	25 – 4	NO LAB
	W	Apr. 13	25: Polarization		
	R	Apr. 14	Chapter 25: Quiz #8 & More Problem Solving		
	F	Apr. 15	Exam III: Chapters 23 & 25	25 – 5	
Wk12	M	Apr. 18	26: The Reflection of light & Plane mirror	26 – 1, 26 – 2	Snell’s Law
	W	Apr. 20	26: Spherical mirrors, ray tracing and mirror equation	26 – 3, 26 – 4	
	R	Apr. 21	Chapter 26: Quiz #9 & Problem Solving		
	F	Apr. 22	26: The refraction of light and lenses	26 – 5	
Wk13	M	Apr. 25	26: Ray tracing of lenses and thin lens equation	26 – 6, 26 – 7	Thin Lenses
	W	Apr. 27	Chapter 26: Quiz #10 & More Problem Solving		
	R	Apr. 28	27: Optical Instruments	27 – 2	
	F	Apr. 29	27: Optical Instruments	27 – 1	
Wk14	M	May 2	Exam IV: Chapters 25 & 26		NO LAB
	W	May 4	Chapter 27: Problem Solving		
	R	May 5	28: Superposition & Interference	28 – 1	
	F	May 6	28: Young’s two-slit experiment & Diffraction	28 – 2, 28 – 4	
FINAL EXAM: MONDAY, May 9, 2022 (8:00 am – 10:00 am)					

INTELLECTUAL PROPERTY STATEMENT

The instructor utilizes copyrighted materials under the “Freedom and Innovation Revitalizing United States Entrepreneurship Act of 2007” (Fair Use Act). Apart from such copyright protected 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 and supplementary materials posted or provided or provided to students authored by the instructor, assessment instruments such as exams, and presentation slides. 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 the finals in the semester in which this course is held.

Links and references to on-line resources provided by the instructor may lead to other sites. The instructor does not sponsor, endorse or otherwise approve of any information appearing in those sites, nor is responsible in any way for the content of those sites. The instructor makes no warranty or responsibility for the copyright status of such material. However, should problems with copyright status be brought to the attention of the instructor, reference to offending materials will be removed.

STUDENTS WITH DISABILITIES

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 visit them at 223 Lawrence Center. Their phone number is 610-436-2564, their fax number is 610-436-2600, their email address is ossd@wcupa.edu, and their website is at <https://www.wcupa.edu/universityCollege/ossd/>. In an effort to assist students who either receive or may believe they are entitled to receive accommodations under the Americans with Disabilities Act and Section 504 of the Rehabilitation Act of 1973, the University has appointed a student advocate to be a contact for students who have questions regarding the provision of their accommodations or their right to accommodations. The advocate will assist any student who may have questions regarding these rights. The Director for Equity and Compliance/Title IX Coordinator has been designated in this role. Students who need assistance with their rights to accommodations should contact them at 610-436-2433.

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 comply with the requirements of Title IX of the Education Amendments of 1972 and the University's commitment to offering supportive measures in accordance with the new regulations issued under Title IX, the University requires faculty members to report incidents of sexual violence shared by students to the University's Title IX Coordinator. 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: https://www.wcupa.edu/_admin/diversityEquityInclusion/sexualMisconduct/default.aspx

ALL OTHER ACADEMIC POLICIES

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

INCLUSIVE LEARNING ENVIRONMENT AND ANTI-RACIST STATEMENT

Diversity, equity, and inclusion are central to West Chester University's mission as reflected in our [Mission Statement](#), [Values Statement](#), [Vision Statement](#) and [Strategic Plan: Pathways to Student Success](#). We disavow racism and all actions that silence, threaten, or degrade historically marginalized groups in the U.S. We acknowledge that all members of this learning community may experience harm stemming from forms of oppression including but not limited to classism, ableism, heterosexism, sexism, Islamophobia, anti-Semitism, and xenophobia, and recognize that these forms of oppression are compounded by racism.

Our core commitment as an institution of higher education shapes our expectation for behavior within this learning community, which represents diverse individual beliefs, backgrounds, and experiences. Courteous and respectful behavior, interactions, and responses are expected from all members of the University. We must work together to make this a safe and productive learning environment for everyone. Part of this work is recognizing how race and other aspects of who we are shape our beliefs and our experiences as individuals. It is not enough to condemn acts of racism. For real, sustainable change, we must stand together as a diverse coalition against racism and oppression of any form, anywhere, at any time.

Resources for education and action are available through WCU's [Office for Diversity, Equity, and Inclusion](#) (ODEI), DEI committees within departments or colleges, the student [ombudsperson](#), and centers on campus

committed to doing this work (e.g., [Dowdy Multicultural Center](#), [Center for Women and Gender Equity](#), and the [Center for Trans and Queer Advocacy](#)).

Guidance on how to report incidents of discrimination and harassment is available at the University's [Office of Diversity, Equity and Inclusion](#).

EMERGENCY PREPAREDNESS

All students are encouraged to sign up for the University's free WCU ALERT service, which delivers official WCU emergency text messages directly to your cell phone. For more information, visit www.wcupa.edu/wcualert. To report an emergency, call the Department of Public Safety at 610-436-3311.