

# **PHYSICS I (PHY 170)**

## **COURSE AND INSTRUCTOR INFORMATION**

**Course:** PHY 170 (Physics I)

**Lecture Time and Location:** MWF: 11:00 am – 11:50 am in **SECC 112**

**Discussion Time and Location:** Thursday, 2:00 pm – 2:55 pm in **SECC 112**

**Note:** *As part of the university's pandemic response, the first two weeks of spring semester classes – January 24 through February 6 – will be virtual only. Faculty will deliver instruction synchronously, in accordance with the set meeting pattern for the class.*

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

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

**Email:** [akandalam@wcupa.edu](mailto: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

## **REQUIRED COURSE MATERIALS & INCLUSIVE ACCESS**

**Textbook and Homework System:** Fundamentals of Physics (**11<sup>th</sup> edition**) by *Halliday, Resnick & Walker* (John Wiley & Sons) with *Wiley-Plus*. An e-text of this book is available through Wiley-Plus website.

**Wiley-Plus:** This course uses the online platform the **new Wiley-Plus** for readings and homework assignments.

**Accessing Wiley-Plus:** You can access Wiley Plus Resources (e-text book) and the homework assignments directly via the course D2L page as follows: ***D2L > Content > Inclusive Access***

You should be able to access the textbook and the homework assignments through D2L.

**Inclusive Access:** **The Wiley-Plus 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 already purchased the Wiley-Plus code last semester or Drop the Course:** You can **opt-out** of ***Inclusive Access*** until the drop/add deadline. 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](mailto:inclusiveaccess@wcupa.edu)

## **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.**

## **COURSE GOALS AND STUDENT 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 PHY170 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.

## **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 in the class regularly, solve the problems assigned in the class, and read the example problems from the textbook. **In order to keep up with the pace of the course, I strongly suggest you to read the sections in the text indicated in the schedule before you get to class.**

## **D2L**

This course has a D2L page. D2L must be your first access point. I will post quizzes, lecture slides, announcements, practice problems etc. on D2L.

## **GRADING**

Student learning will be assessed through regular D2L quizzes, weekly homework assignments, midterm examinations, laboratory, and the final exam. The final grade for this course will be based on the following:

- Laboratory .....15%
- Homework .....15%
- Quizzes .....5%

- 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. Most weeks you will have a lab session. Your lab grade will be factored into your final grade for this course. The allotted laboratory time is only 2 hours; therefore, it is your responsibility to prepare for the lab session by reading the instructions **before lab each week**. At the end of the semester, your lab instructor will give your lab grades to me and I will record exactly what she provides. All lab issues are to be discussed with your lab instructor. Please see the lab syllabus for more details.

### **HOMEWORK POLICIES**

This course will utilize an online homework system via **Wiley-Plus**. 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**. Solutions to all homework problems will be available on Wiley-Plus immediately after the assignment is due. So, **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 the due date is not an excuse.

It cannot be overemphasized the importance of spending time on these assignments. ***The assigned homework is the minimum amount of practice a highly gifted student would need. I strongly suggest doing more, as many as possible, practice problems. Please note the textbook has answers for all of the odd problems.***

### **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 25 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 will take approximately twenty 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 10:30 am – 12:30 pm**

***You should plan to be available for the entire final exams' 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.**

### **EXCUSED 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 that students must be absent from class in order to participate in a University-Sanctioned Event.

## **CONTACT POLICY**

Please include **PHY170** 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.

## **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](mailto: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.

## **PHYSICS TUTORING**

The Learning Assistance & Resource Center (LARC), (610) 436-2535, offers physics tutoring. **I also strongly encourage you to utilize my office hours.**

## **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](http://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	Introduction & Measurements	Ch. 1	Introduction
	W Jan. 26	Ch-3: Vectors	3 – 1	
	R Jan. 27	Ch-3: Vectors	3 – 2, 3 – 3	
	F Jan. 28	Chapter 3: Problem Solving		
Wk2	M Jan. 31	Ch-3: Vectors	3 – 4	<i>Tutorial – I: Uncertainty</i>
	W Feb. 2	Ch-2: Motion along a straight line	2 – 1, 2 – 3	
	R Feb. 3	Ch-2: Motion along a straight line	2 – 4, 2 – 5	
	F Feb. 4	Chapter 2: Quiz #1 & Problem Solving		
Wk3	M Feb. 7	Ch-2: Motion in 1D & Ch-4: Motion in 2D and 3D	4 – 1 to 4 – 3	Acceleration
	W Feb. 9	Ch-4: Motion in 2D and 3D	4 – 4	
	R Feb. 10	Chapter 4: Quiz #2 & Problem Solving		
	F Feb. 11	Ch-4: Motion in 2D and 3D	4 – 5, 4 – 6	
Wk4	M Feb. 14	Ch-5: Force and Motion – I	5 – 1, 5 – 2	Free Fall
	W Feb. 16	Ch-5: Force and Motion – I	5 – 3	
	R Feb. 17	Chapter 5: Problem Solving		
	F Feb. 18	Exam I: Chapters 1 – 4		
Wk5	M Feb. 21	Ch-6: Force and Motion – II	6 – 1, 6 – 2	<i>Tutorial – II: Agreement</i>
	W Feb. 23	Ch-6: Force and Motion – II	6 – 2, 6 – 3	
	R Feb. 24	Chapter 6: Quiz #3 & Problem Solving		
	F Feb. 25	Ch-7: Kinetic Energy and Work	7 – 1 to 7 – 3	
Wk6	M Feb. 28	Ch-7: Kinetic Energy and Work	7 – 4 to 7 – 5	Projectile Motion
	W Mar. 2	Ch-7: Kinetic Energy and Work	7.6	
	R Mar. 3	Chapter 7: Quiz #4 & Problem Solving		
	F Mar. 4	Ch-8: Potential Energy and Conservation of Energy	8 – 1 to 8 – 2	
Wk7	M Mar. 7	Ch-8: Potential Energy and Conservation of Energy	8 – 3 to 8 – 4	<i>Tutorial – III: Error Propagation</i>
	W Mar. 9	Chapter 8: Problem Solving		
	R Mar. 10	Exam II: Chapters 5 – 7		
	F Mar. 11	Ch-8: Potential Energy and Conservation of Energy Chapter 8: Quiz #5	8 – 4 to 8 – 5	
	M Mar. 14	SPRING BREAK		NO LAB
	W Mar. 16			
	R Mar. 17			
	F Mar. 18			
Wk8	M Mar. 21	Ch-9: Linear Momentum & Collisions	9 – 1 to 9 – 4	Momentum
	W Mar. 23	Ch-9: Linear Momentum & Collisions	9 – 5 to 9 – 7	
	R Mar. 24	Chapter 9: Quiz #6 & Problem Solving		
	F Mar. 25	Ch-9: Linear Momentum & Collisions	9 – 8 to 9 – 9	
Wk9	M Mar. 28	Ch-10: Rotation	10 – 1 to 10 – 2	NO LAB
	W Mar. 30	Ch-10: Rotation	10 – 3 to 10 – 4	
	R Mar. 31	Chapter 10: Quiz #7 & Problem Solving		
	F Apr. 1	Ch-10: Rotation	10 – 6 to 10 – 8	



	Date	Lecture and Discussion	Reading	Laboratory
Wk10	M Apr. 4	Ch-11: Torque and Angular Momentum	11 – 1, 11 – 3	Uncertainty Exam
	W Apr. 6	Ch-11: Torque and Angular Momentum	11 – 4, 11 – 5	
	R Apr. 7	Exam III: Chapters 8 – 10		
	F Apr. 8	Chapter 11: Problem Solving		
Wk11	M Apr. 11	Ch-11: Torque and Angular Momentum	11 – 6 to 11 – 8	Torque
	W Apr. 13	Ch-13: Gravitation	13 – 1 to 13 – 3	
	R Apr. 14	Ch-13: Gravitation	13 – 4, 13 – 5	
	F Apr. 15	Chapter 13: Quiz #8 & More Problem Solving		
Wk12	M Apr. 18	Ch-13: Gravitation	13 – 6, 13 – 7	NO LAB
	W Apr. 20	Ch-15: Oscillations	15 – 1, 15 – 2	
	R Apr. 21	Ch-15: Oscillations	15 – 3, 15 – 4	
	F Apr. 22	Chapter 15: Quiz #9 & Problem Solving		
Wk13	M Apr. 25	Ch-15: Oscillations	15 – 5, 15 – 6	Pendulum
	W Apr. 27	Ch-16: Waves	16 – 1 to 16 – 4	
	R Apr. 28	Ch-16: Waves	16 – 5 to 16 – 7	
	F Apr. 29	Exam IV: Chapters 11, 13, & 15		
Wk14	M May 2	Chapter 16: Quiz #10 & Problem Solving		Standing Waves
	W May 4	Ch 16 & 17: Waves	17 – 1 to 17 – 4	
	R May 5	Ch 14: Fluids	14 – 1to 14 – 4	
	F May 6	Ch 14: Fluids	14 – 5 to 14 – 7	
FINAL EXAM: MONDAY, May 9, 2022 (10:30 am – 12:30 pm)				

### 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.

### 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](#)

## **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](https://www.wcupa.edu/_admin/diversityEquityInclusion/sexualMisconduct/default.aspx)

## **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](http://www.wcupa.edu/wcualert). To report an emergency, call the Department of Public Safety at 610-436-3311.