# Physics 170, Fall 2020, Course Syllabus

#### **Instructor:**

Dr. Matthew M. Waite, Merion 133, ext: 2573, mwaite@wcupa.edu

The best way to contact me is via WCU e-mail. But, be aware that I will only read and respond to e-mails written in **proper English**, with **correct grammar**, **spelling**, and **etiquette**. Do not send me any e-mails addressed to "hey" written in text-speak like you're talking to your roommate about meeting up at Barnaby's tonight... I might meet up for happy hour, but I won't answer any questions about class or homework!

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.

Class Meeting: MWF 11-11:50 am (Lecture-MER-112), R 2-3 pm (Recitation-SSN190)

**Office Hours:** By appointment via Zoom. E-mail me for appointment.

https://wcupa.zoom.us/j/845113288?pwd=cmx2enJoSEFtVlZlUmxtM0hIYU5YQT09

#### Course Web Page: D2L

WileyPLUS: You can can register for this section following the instructions on the Wiley Flyer on D2L. The Course number is <u>A54743</u>

Course information can be found here throughout the semester. The syllabus, homework problem solutions, and other interesting stuff can be found here. Check it periodically!!

**Text:** Fundamentals of Physics, (11th Ed.) by Halliday, Resnick & Walker, (John Wiley & Sons, Hoboken, NJ, 2018) Vol. 1 (Ch 1-20). (With WileyPLUS, see note below!) (We will be using Vol. 2 for PHY180, so if you are purchasing the textbook, I suggest purchasing the Extended 11th Edition)

 $\underline{https://www.wiley.com/en-us/Fundamentals+of+Physics\%3A+Extended\%2C+11th+Edition-p-9781119306856}$ 

#### Grading:

3 Exams (4 & drop lowest)15% @	45%
Homework	15%
Lab	20%
Cumulative Final	20%

**Zoom Meeting:** This course will meet via Zoom at the times listed above for lecture. Office hours and other meetings can be conducted through Zoom as well. The Zoom link for the is course is as follows:

https://wcupa.zoom.us/j/98209300389?pwd=ZDhnM11BeVhTYkxOWjVSd0pFR2N3QT09

Meeting ID: 982 0930 0389

Password: 784688

It is a violation of state and federal law to record, photograph or screenshot these Zoom meetings and lectures. I, and the University, will prosecute violations.

## **Objectives:**

PHY 170 is both an approved science general education course, and the first course in the physics major.

### General Education Objectives.

PHY170 is an approved science distributive course in the WCU General Education program. Thus, it is designed to allow students to achieve General Education Goals 1, 2 and 3. This is done as follows:

1. <u>Gen Ed Goal #1:</u> Communicate effectively: <u>(Student Learning Outcome 1a:</u> <u>Express oneself effectively in common college level written form.)</u> A scientist's greatest asset is communication. Consider Stephen Hawking. Although greatly debilitated by ALS, he was still able to effectively communicate and share his ideas far more effective than most scientists! Thus, we, as scientists, need to strive to be able and effective communicators, and to share our ideas and discoveries. For any problems on exams or in laboratory exercises, you will be expected to clearly and fully explain each step. This will demonstrate your thought process and allow you to communicate to your instructor and classmates how you understood the problem at hand, and how you decide to proceed to find an answer of solution.</u>

2. <u>Gen Ed Goal #2:</u> Think critically and analytically: <u>(Student Learning Outcome</u> <u>2c: Reach sound conclusions based on a logical analysis of evidence.)</u> Contrary to popular belief, physics is not simply "word problems." The study of Physics is a study of how nature behaves. Thus, we need to carefully observe various physical situations, think about how nature in behaving and assess how the situation might proceed as we let nature take its course. By studying simplistic problems, we can extrapolate the concepts and ideas out to more complex situations. Thus, we will learn how to look at a problem, analyze what final solution is desired and to determine what steps will take you from the presentation of the problem to the final answer or solutions. On hourly exams and the final exam, step by step instructions will not be provided by your instructor, rather you will be expected to decided what steps are necessary to achieve the goal.

3. Gen Ed Goal #3: Employ quantitative concepts and mathematical methods: (Student Learning Outcome 3a: Employ quantitative methods to examine a problem in the natural or physical world.) In Physics, mathematics is often considered a tool with which the physicist does his/her work, just like saws and wrenches and screwdrivers are the tools a craftsman would use to do his/her trade, or paintbrushes pencils or clay might be the tools of an artist's trade. Thus, we will learn how to use mathematical tools such as algebra, trigonometry and calculus to solve the aforementioned problems. A final numerical answer will typically be required on lab assignments and exam problems, but these assignments will be assessed not only on the final numerical answer, but also on the proper choice of the correct tool for the task at hand and the steps taken in reaching a final numerical answer (how the tools are used).

In this course students will also begin to develop the basic laboratory skills needed to engage in the scientific method. (Student Learning Outcome 3b: Apply the basic methods and thought processes of the scientific method for natural/physical science in a particular <u>discipline.</u>) Particular attention will be paid to the understanding of concepts such as uncertainty in our numerical analysis during lab. This will be achieved through exam problems in which students are asked to solve a problem. Students will be assessed on their ability to apply the mathematical equation to the concepts in the problems. They will be expected to show all steps, following legitimate physical problem solving skills in their solution in order to demonstrate to the instructor that they understand the physical concepts of the problem. This will involve a study of the comparison of theoretically determined values to experimentally determined values and an assessment of whether the two values are in agreement. Students will be expected to record their work in a lab book which will be collected and graded after each lab. And weekly homework assignments will be graded.

#### **Physics Program Objectives:**

PHY 170 addresses two of the core student learning objectives of the physics program.

#### Outcome A: Knowledge and understanding of the concepts and principles of physics

PHY 170 is a survey course in mechanics which introduces the foundational concepts and principles of Physics. These include but are not limited to, describing motion mathematically, understanding force and newton's laws, understanding energy and the work-energy theorem, and understanding the physics of waves and fluids. *These outcomes will be assessed primarily through homework and exams associated with the lecture portion of the course.* 

#### Outcome B: Research skills and Information Literacy

PHY 170 is an important introduction to Physics as an experimental science. As such it is a foundational course in developing research skills. Student learning objectives include but are not limited to understanding the components of a good lab notebook, organizing data effectively, plotting data effectively, understanding the basic concepts of measurement uncertainty, being able to compare values with uncertainties. *These concepts will primarily be assessed through lab notebook entries*.

#### COVID-19 Statement:

Part of West Chester University's response to the COVID-19 pandemic was to switch the vast majority of instruction to remote. This decision was made out of an abundance of caution to protect the health of all members of the WCU community. Faculty have been asked to make every effort to adapt their courses to this novel situation while still meeting the critical learning outcomes of the course. Students are asked to discuss any problems with the new course format and schedule directly with their instructors. Patience and flexibility on everyone's behalf are critical to our community's navigation of this public health crisis.

For this particular course, the following alternative modalities are being utilized:

- 1) Class meetings will be synchronous on Zoom. (See Zoom link on page 1)
- 2) Exams will be administered remotely. (See details on page 4)

#### Attendance:

You are expected to attend every class period, period. <u>This semester it will all be remote, so we</u> will meet on Zoom at the regularly scheduled meeting time as indicated in MyWCU.

Excused absences are limited to University-Sanctioned Events (which follow the Excused Absence Policy for University-Sanctioned Events as described in the West Chester University Undergraduate Catalog), and absences due to serious illness or injury, or the death of family members, all with proper notification from Student Affairs.)

When we are meeting on Zoom, please ensure that you are in a quiet location, and you will not be disturbed by roommates, family members, or pets. These distractions may interfere with both your, and your classmates, learning experience. Taking classes online can be stressful and extra attention must be paid to the class in order to really follow along. Minimization of distraction is necessary.

There will be four exams over the course of the semester. The first will be given after completion of chapters 1-4. The second will be given after completion of chapters 5-8. The third will be given after completion of chapters 9-13. And the fourth will be given after completion of chapters 14-17. These exams will cover primarily the material from the stated chapters, but they will be somewhat cumulative in the sense that the entire course builds upon itself as we proceed. The final exam will be cumulative. **I do NOT give make-up exams.** I will, however, drop your lowest exam grade. Thus, everyone gets one dropped exam for whatever reason (University Sanctioned Events included, as well as court dates, car trouble, hangovers, bellyaches, weddings, etc.) Should you miss an exam, it will be considered your dropped exam, should you miss more than one exam, one will be dropped and the other will be recorded as a zero. **There are NO exceptions to this policy.** 

**Exams - Fall 2020:** PDF files will be provided on exam day. Since I would like to offer you up to two hours to complete the exam (again, I am OFFERING this... it is NOT a requirement. If you do not want the extra time to allow for printing, scanning, contacting me for questions, etc, you do not have to take it. You can complete the exam between 11:00 AM and 11:50 AM and submit.) I will email the exam to you depending on your availability before, after, or during another 2-hour time block on that day. You will let me know before exam day the time (10 am, 11 am or "other") that you want the exam e-mailed to you.

The exam will be open book, open notes. But no access to online D2L materials. I will not provide an equation sheet. Since it will be open notes, you should have all your notes from lecture and will not need my equation sheet.

You can do one of the three options:

1) Download the exam on a tablet or iPad and complete it.

2) Print the exam, complete it and scan it. See D2L for scanner options.

3) If you have no tablet and no printer, then read the problems online, compete the problems on a separate piece of paper and scan it. See D2L for scanner options.

# <u>Upload it to the D2L submissions folder as a PDF. (Make sure it is saved correctly and that the annotations and markings you added are viewable.)</u>

You will have 2 hours to complete exams to account for the extra time needed to ask me questions via email and Zoom, print and scan. It MUST be back in the D2L submission box within 2 hours of the time I sent it. A zero will be record as the exam grade if I do not receive it with 2 hours of the time I sent it.

#### Homework:

Homework assignments will be complete using the online WileyPLUS course supplement. A link to this site is on D2L and the webpage listed at the beginning of this syllabus. Homework assignments are due by 8:00 pm on the due date. At 8:00 pm, the site will no longer accept homework submissions. I cannot change this. So PLEASE don't ask for an extension. As much as I want to grant it (and I really do most times, really, honestly, not kidding you) I cannot change the WileyPLUS program to allow it! I will, however, drop the lowest homework grade. So, if you miss one assignment, or even two, it's not going to affect your grade drastically. But, note that homework amounts to 15% of your total grade, as much as any single exam. Even if you get 100% on all exams, labs and the final... you cannot get an A without doing your homework assignments! They are considered part of the course, and exams are written and administered with the understanding that you have worked on the homework assignments.

#### Laboratory:

Most weeks you will have a lab session. These sessions will be held on Tuesdays at 9:30, 1 or 3. You are to purchase a lab manual with all the lab assignments from Dynamic Bookstore, as well a BLUE soft cover lab notebook. 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**. We will occasionally have lab quizzes based on the book <u>An Introduction to Error Analysis</u> by John Taylor. Details will be given in lab.

#### WileyPLUS:

We will be using **Halliday Physics 11e with WileyPLUS Next Gen** this fall. You should get a code with your textbook when you buy the textbook. Or, if you don't want to purchase a hard copy, you can get the full e-book online when you use the online registration. There is a flyer on D2L which provides instructions about how to sign onto the Wiley NEXT GEN platform.

To register for your course simply go to <u>www.wileyplus.com/go/login</u>. Click "Sign up now" to create an account. You will be asked to enter your course section ID (<u>A54743</u>) for *Physics 170, Fall 2020* to find your course and complete the registration process.

If you already have a WileyPLUS account, just log in and click the yellow 'Add more courses' button. You will be asked to enter your course section ID ( $\underline{A54743}$ ) to find your course and complete the registration process.

#### **Miscellaneous:**

Please make any restroom visits before the class starts, or wait until it ends, the class is only 50 minutes. It is distracting to both the instructor as well as your fellow students when someone gets up and walks out of the classroom during lecture. Only in very rare circumstances will permanent physical damage be done by waiting a few more minutes for class to end... In fact, many doctors claim that waiting up to 2-3 hours is no problem (except for a bit of discomfort) at all. Tell you what, if I go off on a tangent and babble on and on for 2-3 hours, I'll let you get up and take a break... promise.

**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 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.

#### Common University Syllabus Content: (See Document on D2L)

#### **COVID-19 STATEMENT**

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### 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**.

#### 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 <u>https://www.wcupa.edu/</u>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.

#### EXCUSED ABSENCES POLICY

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.

#### 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: <u>https://www.wcupa.edu/\_admin/diversityEquityInclusion/</u>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. To report an emergency, call the Department of Public Safety at 610-436-3311.

#### ELECTRONIC MAIL POLICY

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.

**Schedule:** (See the schedule on D2L)

Month	Date	Week Reading		Торіс	Lab & Recitation	Hmwk		
Aug.	<del>2</del> 4	1-M	Ch1	Introduction & Measurements			1	<del>1.75%</del>
	25	Tu			Intro. / Tutorial 1: Uncertainty			
	26	W	Ch. 3	Vectors			2	3.5%
	27	Th			Intro, Units & Conversions		3	5.3%
	28	F	Ch. 3 & 2	Vectors & Motion in 1-D		(1)	4	7.0%
	31	2-M	Ch. 2	Motion in 1-D			5	8.8%
	1	Tu			Lab 2: Measuring acceleration			
	2	W	Ch. 2	Motion in 1-D			6	10.5%
	3	Th			Vectors & 1-D Motion		7	12.3%
	4	F	Ch. 4	Motion		(3, 2)	8	14.0%
Sept.	7	<b>2-M</b>	NA	Labor Day			9	15.8%
	8	Tu			Tutorial 2: Agreement			
	9	W	Ch. 4	Motion in 2-D & 3-D			10	17.5%
	10	Th			2-D and 3-D Motion		11	19.3%
	11	F	Ch. 5	Forces & Motion I			12	21.1%
	14	4-M	Ch. 6	Forces & Motion I & II		(4)	13	22.8%
	15	Tu			Lab 3: Free fall			
	16	W	EXAM I	Chapters 1-4			14	24.6%
	17	Th					15	26.3%
	18	F	Ch. 6	Forces & Motion II	Forces I & Forces II		16	28.1%
	21	5-M	Ch. 7	KE & Work		(5, 6)	17	29.8%
	22	Tu			Lab 4: Projectile motion			
	23	W	Ch. 7	KE & Work			18	31.6%
	24	Th			Work & KE		19	33.3%
	25	F	Ch. 7	KE & Work			20	35.1%
	28	6-M	Ch. 8	PE & Conservation		(7)	21	36.8%
	29	Tu			Tutorial 3: Error propagation			
	30	W	Ch. 8	PE & Conservation			22	38.6%
Oct.	1	Th			Potential Energy		23	40.4%
	2	F	Ch. 9	Center of Mass & Momentum			24	42.1%
	5	7-M	Ch. 9	Center of Mass & Momentum		(8)	25	43.9%
	6	Tu			Lab 7: Cons. of momentum			
	7	W	Ch. 9	Momentum & Collisions			26	45.6%
	8	Th					27	47.4%
	9	F	Ch. 10	Rotation	Momentum & Collisions		28	49.1%
	12	<b>8-M</b>	EXAM II	Chapters 5-8			29	50.9%
	13	Tu			NO LAB	(9)		
	14	W	Ch. 10	Rotation			30	52.6%
	15	Th			Rotation & Torque		31	54.4%
	16	F	Ch. 11	Torque & Ang. Mom.			32	56.1%
	19	9-M	Ch. 11	Torque & Ang. Mom.			33	57.9%
	20	Tu	01 14		Lab 8: Torque/Equilibrium	(10.118)	<b>A</b> (	50 604
	21	W	Ch. 12	Equilibrium		(10, 11)	34	59.6%
	22	Th	01 10		Equilibrium		35	61.4%
	23	F	Ch. 13	Gravitation			36	03.2%
-	26	10-M	Ch. 13	Gravitation			57	04.9%
	27	lu	C1 14	<b>F1</b> 1	Lab 9: Kepler's 3rd Law		20	(( 70/
	28	W	Cn. 14	Fluids	Ourseite.		38	00./%
	29		C1- 1.4	T-1: J-	Gravity	(12, 12)	39	08.4%
NL	30	F	Ch. 14	F IUIOS		(12, 13)	40	/0.2%
NOV.	2	II-M	Cn. 14	FIUIDS	Lincertainte France		41	/1.9%
	5	10	CL 14	Ehrida	Uncertainty Exam		42	72 70/
	4	W Th	Cn. 14	FIUIDS	Ehrida		42	75 10/
	5		EVANA III	Chapters 0.12	riulas		43	77.20/
	0	12 M	Ch 15	Oscillations			44	78 00/
	9 10	12-1VI Tu	CII. 15	Oscillations	I ah 12. The pendulum & SUM	(14)	-+5	10.770
	11	1 U W/	Ch 15	Oscillations	Lao 12. The pendulum & SHW	(1+)	16	80 7%
	11	٧٧	CII. 15	Oscillations			0	00.770

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	12	Th			Waves		47	82.5%
	13	F	Ch. 16	Waves I			48	84.2%
	16	13-M	Ch. 16	Waves I			49	86.0%
	17	Tu			Lab 13: Standing waves	(15)		
	18	W	Ch. 16-17	Waves I & Waves II			50	87.7%
	19	Th			Thermodynamics		51	89.5%
	20	F	Ch. 17	Waves II			52	91.2%
	23	14-M	<b>T'Giving</b>	No Classes				
	24	Tu	<b>T'Giving</b>	No Classes				
	25	W	<b>T'Giving</b>	No Classes				
	26	Th	<b>T'Giving</b>	No Classes				
	27	F	<b>T'Giving</b>	No Classes				
	30	15-M	Ch. 18	Temp., Heat & 1st Law			53	93.0%
Dec.	1	Tu			TBA	(16, 17)		
	2	W	Ch. 18-19	1st Law & Kinetic Theory			54	94.7%
	3	Th	EXAM IV	Chapters 14-17			55	96.5%
	4	F	Ch. 19	Kinetic Theory	Review/SNOW DAY Catch up		56	98.2%
	7	16-M	All of it!	Review	Have questions ready today!	(18, 19)	57	100.0%