

Syllabus
Physics 100-80: Elements of Physical Science
Spring 2017

COURSE AND INSTRUCTOR INFORMATION

Meeting Time for Physics 100-80: Monday, Wednesday, 7:15-8:30, Merion Science Center 112

Instructor: William H. Sawyer, Ph.D.

Office Location: Merion Science Center Room 103

Office Hours: Monday and Wednesday 6:00 PM to 7:00 PM; Tuesday and Thursday 11:00 AM to 12:00 PM; and 4:00 PM to 5:00 PM or by appointment.

Email: wsawyer@wcupa.edu

COURSE DESCRIPTION

An entirely new approach to Physics 100, this course is designed to stimulate your imagination, challenge your preconceived notions about the world around you, and help you develop real world decision-making skills. It has been designed to provide you with knowledge of the principles of physics, its perspectives, and the related skills necessary for you to be a successful citizen of the state and the world. It uses a modified case study approach to examine some of the critical decisions to be faced by tomorrow's leaders. Although input from all the disciplines from anthropology to zoology could and probably will affect these decisions in one way or another we will focus on the decision-making process and the critical role the techniques and concepts of physics will play in them.

The emphasis is on what we know, what we need to know and how we get there. Mathematics is an important tool if you are doing Physics. This course assumes you are not planning to be a physicist, (if you are you are in the wrong course) but all of you will be decision-makers. Some of you will be leaders making decisions that affect not only your lives and those of your family but the lives of many others as well. The emphasis will be concepts, facts, and how to integrate them to make an informed decision. So prepare to challenge your preconceived ideas, and think.

GOALS

PHY 100 is an approved course in the West Chester University General Education program.

Gen Ed Goal # 2 Develop the ability to employ quantitative concepts and mathematical methods.

This goal will be met through lectures, in class examples with class participation, homework, team projects, quizzes, and exams.

Gen Ed Goal # 3 Develop the ability to think critically and analytically.

This goal will be accomplished through a combination of activities including lectures, class discussion, homework, team projects, quizzes, exams and peer evaluations

OUTCOMES

At the end of this course you should be able to accomplish the following:

- Effectively frame a research question, including differentiating among facts, opinions, and inferences by assessing and evaluating sources.
- Apply conceptual knowledge to identify assumptions, make logical inferences, identify defective logical inferences, and reach reasonable conclusions.

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- Apply procedural knowledge to unpack complex problems into constituent parts, identify reliable problem-solving methods, accurately apply problem-solving methods
- Identify the presence of multiple perspectives and explain the contextual factors that account for these perspectives.
- You should be able to examine data that is presented to you in a context such as a chart or graph, and draw reasonable conclusions based on data.
- You should be able to identify the critical information necessary to solve a quantitative real world problem, then use this information and the basic tools of mathematics to solve it.

EXPECTATIONS

I. Preparation

This class uses a text book and clickers. You will be expected to read about 30 pages per week and come to class prepared to discuss what you have read. Although the class is large, you will be asked questions during the class and discussion among you and your classmates will be encouraged.

II. Attendance

Class attendance is mandatory. If you have to be absent for some reason please let me know ahead of time, refer to the **ATTENDANCE POLICY** below.

III. Class participation – 15% of your total grade

- a. It will be assumed that you have read any material assigned prior to a particular lecture and are prepared to discuss it in class.
- b. Class attendance and participation in discussions is required and will be part of your grade.
- c. If you have questions about the material to be covered in class you should be prepared to ask them and assist in providing answers to your fellow students questions.
- d. Assume that from time to time you will be called upon to answer questions about the material being discussed.
- e. At the beginning of each class there will be a series of 3 or 4 clicker questions on key ideas presented in the previous lecture
- a. In addition to the review questions at the beginning of each lecture, there will be clicker questions throughout the lecture. These questions are designed to stimulate discussion and help you test your understanding of the ideas that were just presented.
 - i. You will receive 2 points for answering the question and 3 points for answering it correctly.
 - ii. Each day at the end of the class your score will be normalized on a 10 point scale and posted on D2L.
 - i. If you answered all the questions correctly you will get 10 points,
 - ii. If you answered all of the questions but all of your answers were wrong you would still receive 6.6 points.
 - iii. **Unexcused absence**: you will receive a 0 for that day. (See Attendance policy below.)

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IV. Homework – 15% of your total grade

- a. You *may work together* to develop your solutions to the homework assignments but the work you turn in must be your own.
- b. Homework will be posted on D2L every Monday at midnight (12:00 am) and will be due the following Monday night by midnight (12:00 am). Since homework is done on line and you have a week to complete it there is no reason for it to be late. Late homework will not be graded.
- c. **Do not do your homework using your smart phone!** D2L may not register what you have done.

V. Projects – 20 % of your total grade

- f. There will be two (2) group projects during the semester.
- g. The objective is for you gain a greater understanding of a particular concept through researching it, then devising a way to clearly present it to the rest of the class.
- h. I will divide the class into groups of 5. Everyone in a group will receive the same grade. If one member of a group does not participate, taking advantages of their colleagues desire to accomplish something and it is called to my attention I will decide based on a discussion with the individual and the circumstances how to handle the situation.
- i. Each project will result in a demonstration or a presentation of some type as defined in the assignment. The groups will present their projects or demonstrations to the class on project days. There will be one project day for each project. You will be graded by the other members of the class. You will use software sent to you on your cellphones for grading the projects. I reserve the right to edit the grade your group receives if I feel it is inappropriate.
- j. Although you will be given some time in class to organize and work on your projects most of your work will have to be done on your own time.

VI. Semester Exams - 30% of your total grade

- a. There will be three semester exams. Each one will cover the material from the previous exam up until the current exam.
- b. Each exam will be worth 10% of your final grade.

VI. Final Exam - 20% of your final grade

- a. The final exam will be comprehensive: it cover all of the material we have discussed during the semester. It will be worth 20% of your final grade.

ASSESSMENT

Valuation

1. Homework	15%
2. Attendance and Class participation	15%
3. 2 Projects	20% (10% each)
4. 3 Semester Exams	30% (10% each)
5. Final Exam	20%

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Grading

A letter grade will be assigned based on performance in the course according to the following scale:

Grade	Quality Points	Percentage Equivalents	Interpretation
A	4.00	93-100	Excellent
A-	3.67	90-92	
B+	3.33	87-89	Superior
B	3.00	83-86	
B-	2.67	80-82	
C+	2.33	77-79	Average
C	2.00	73-76	
C-	1.67	70-72	
D+	1.33	67-69	Below Average
D	1.00	63-66	
D-	0.67	60-62	
F	0	< 60%	Failure

Refer to the Undergraduate Catalog for description of NG (No Grade), W, Z, and other grades.

COURSE MATERIALS

Clickers are required.

1. You **must use** the **Turning Technologies Response Card** (available in the bookstore in Sykes) in order for your attendance and class participation to be recorded.
2. Once you have your ResponseCard you **must register it with D2L** in order for your attendance and class participation to be recorded.
3. **Go to the class website on D2L** and click on ***“Registering your clicker or mobile device”*** and follow the instructions.

Text book is required

Physics and Technology for Future Presidents: An Introduction to the Essentials of Physics Every World Leader Needs to know; Author: Richard A. Muller
Publisher: Princeton University Press, ISBN 978-0-691-13504-5 (Cloth: alk. Paper)

CONTACT POLICY

University 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.

Email: WSawyer@wcupa.edu (please include your name, the course number, and one or two words indicating the purpose of your email in the subject line.

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Office Phone: 610 436 2897

ATTENDANCE POLICY

Attendance will be taken. If you have to miss a class you must notify the instructor ahead of time or have a note from the health service or a physician.

Late arrival: More than 15 minutes late, you will not be seated

Illness: The Pennsylvania Department of Health has noted a significant increase in the incidence of influenza (flu) and the norovirus (responsible for severe vomiting and diarrhea) in our region this winter. Influenza is now becoming widespread through much of the country. Both of these viruses can be easily spread from person to person.

West Chester University Student Health Services will follow CDC recommendations directed towards reducing the burden of the disease and minimizing its spread. The CDC recommends that individuals with flu stay at home for at least 24 hours after fever is gone without the use of a fever-reducing medicine. The CDC also recommends that individuals with unexplained vomiting or diarrhea should be advised to stay home until they are completely well.

The University is strongly urging students with flu or norovirus to go home to rest and recover. Students who are unable to go home should not attend classes or any public gatherings.

I understand absenteeism can have an impact on your semester. If you miss class due to flu or the nor virus I will make every reasonable effort to enable you to complete your course work. If you miss an exam because you were sick, you will be required to present a note from the University Health Service or a physician in order to take a make-up exam.

You may find the following links helpful <http://www.cdc.gov/flu/> and <http://www.cdc.gov/norovirus/>

University Sanctioned events: If you participate in a sport or other activity that requires you to miss a class for a University sanctioned event your coach or advisor will provide you with an information sheet for you to give to your instructors. In order for you to have an excused absence you will need to show me this sheet prior to your missing the class.

EXAM POLICY:

- There will be three exams plus the final. All exam grades count. I **do not** drop one exam.
- **Late arrival for an exam:** If you arrive for an exam after the first person has turned in their exam
 - i. **You will not be seated**
 - ii. **You will not have the opportunity to take the exam at a later time.**
 - iii. **No exceptions.**
- **Exam Make-up Policy**
 - i. **Illness:** You may make up an exam if you were ill and **have a physician's note** on their letterhead.

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- ii. **Family emergency:** You may make up an exam if you had a family emergency provided you **have a letter of explanation** from another family member or other reasonable documentation.
- iii. **University sanctioned event:** You may take an exam on an alternate date provided you **have a signed form** from your coach or official sponsor.
- You must take the final exam with your assigned section. This is a University rule. What is more the class is full so there are no extra seats to accommodate you.

ELECTRONIC DEVICES POLICY

The following electronic devices are not allowed in class or exams

- **Laptop computers** – The lecture slides are posted on D2L following each class. If you must take notes do so with pen and paper.
- **Cell phones** - *Use of cell phones and texting in class is not allowed.* Please arrange for all electronic devices to be turned off and put away.
- *If you use your cell phone for any reason during class you will be asked to leave immediately and you will not be given the opportunity make up work you miss.*
- If you need to use a device to accommodate a disability, please tell me at the beginning of class and refer to the DISABILITY STATEMENT above.

D2L

- This course has a D2L web page. Homework assignments will be posted on Mondays at midnight (12:00 am) and are due the following Monday by midnight . (see Homework above)
- From time to time other important information may also be posted there.
- Lecture slides will be posted following the lecture.

SEXUAL HARASSMENT AND SEXUAL VIOLENCE (Title IX)

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/.

ACADEMIC & PERSONAL INTEGRITY

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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. 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 ossd@wcupa.edu, and their website is at www.wcupa.edu/ussss/ossd.

EXCUSED ABSENCES POLICY FOR UNIVERSITY-SANCTIONED EVENTS

Students are advised to carefully read and comply with the excused absences policy 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 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/>.

EMERGENCY PREPAREDNESS

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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.

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CLASS SCHEDULE

(I reserve the right to make changes to this schedule subject to the vicissitudes of reality)

DATE	Day	Topic	Reading Assignment	Homework Due
1/23/2017	Monday	Energy I	Chapter I	
1/25/2017	Tuesday	Energy II	“	
1/30/2017	Monday	Energy III	“	Homework 1
2/1/2017	Tuesday	Energy IV	“	
2/6/2017	Monday	Atoms & Heat I	Chapter 2	Homework 2
2/8/2017	Tuesday	Atoms & Heat II	“	
2/13/2017	Monday	Atoms & Heat III	“	Homework 3
2/15/2017	Tuesday	Review	Chapters 1 & 2	
2/20/2017	Monday	Exam 1 covering Chapters 1&2		Homework 4
2/22/2017	Tuesday	Project Day		Project 1
2/27/2017	Monday	Force	Chapter 3	Homework 5
3/1/2017	Tuesday	Gravity	“	
3/6/2017	Monday	Space	“	Homework 6
3/8/2017	Tuesday	Nuclei & Radioactivity	Chapter 4	
3/13/2017	Monday	Spring Break		
3/15/2017	Tuesday			
3/20/2017	Monday	Radiation & Cancer	Chapter 4	Homework 8
3/22/2017	Tuesday	Fission, Fusion and You	“	
3/27/2017	Monday	Chain Reactions	Chapter 5	Homework 9
3/29/2017	Tuesday	Review	Chapters 3 & 4	
4/3/2017	Monday	Exam 2 Covering Chapters 3 & 4		Homework 10
4/5/2017	Tuesday	Project Day		Project 2
4/10/2017	Monday	Nuclear Reactors	Chapter 5	Homework 11
4/12/2017	Tuesday	Nuclear Waste	“	
4/17/2017	Monday	Electricity & Magnetism	Chapter 6	Homework 12
4/19/2017	Tuesday	Motors, & Generators	“	
4/24/2017	Monday	A little about light and Wi-Fi I	Chapter 7	Homework 13
4/26/2017	Tuesday	A little about light and Wi-Fi II	Chapter 7	
5/1/2017	Monday	Review	Chapters 5,6&7	Homework 14
5/3/2017	Tuesday	Exam 3 Covering Chapters 5, and parts of 6&7		
5/8/2017	Monday	PHY 100-80 Final 7:00-9:00 pm		