

Syllabus
Physics 100-03 & Physics 100- 06: Elements of Physical Science
Spring 2016

COURSE AND INSTRUCTOR INFORMATION

Meeting Time for Physics 100-03: Tuesday, Thursday, 12:30-1:45

Meeting Time for Physics 100-06: Tuesday, Thursday, 9:30-10:45

Meeting Location: Merion Science Center 112

Instructor: William H. Sawyer, Ph.D.

Office Location: Merion Science Center Room 132

Office Hours: Monday and Wednesday 11:00 to 12:00; Tuesday and Thursday 11:00 to 12:00; and 2:00 to 3:00 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 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 will be. 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 understand how to approach a real world problem and attempt to identify the most critical issues influencing it. You should understand how to use these issues to build a simple model of the problem, test your model and draw conclusions from your results. You should be able to draw conclusions based on data given to you in various forms such as graphs and charts. In addition you should have a basic understanding of the nature of energy, heat, electricity, light, and radiation, a historical perspective regarding the development of these concepts and some of the ethical issues surrounding their application.

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EXPECTATIONS

Since there is no textbook for this class (there is a required reading list however, see below), 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.

I. Class participation

- 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. Random quizzes can be expected just to make sure you are keeping up.

II. Homework

- 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 is due every Friday by 5:00 PM. Since homework is done on line there is no reason for it to be late. Late homework will not be graded.

III. Attendance, Class Participation and quizzes

- a. Attendance is required. You will be expected to be present in class and you will be responsible for the material presented there.
- b. From time to time, there will be short unannounced quizzes over the material presented in the preceding lecture as well as assigned reading material.

IV. Projects

- a. There will be two (3) group projects throughout the semester.
- b. The objective is for you gain a greater understanding of a particular principle through devising a way to illustrate (demonstrate) it to the rest of the class.
- c. 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.
- d. 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 demonstration days. There will be one demonstration day for each project. You will be graded by the other members of the class. You will use your clickers for grading the projects. I reserve the right to edit the grade your group receives if I feel it is inappropriate.
- e. 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.

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IV. Exams

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

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. The *ResponseWare* software **will not work** for this class. If you purchased the *ResponseWare* software for your cell phone please return it and purchase the Response Card.
2. Once you have your ResponseCard you **must register it with D2L** in order for your attendance and class participation to be recorded. Go to <http://www.wcupa.edu/infoservices/clientServices/digitalCorner/clickersStudents.aspx>
3. Click on ***“Registering your clicker or mobile device”*** and follow the instructions.

Books

Fear of Physics (A guide for the Perplexed) Author: Lawrence M. Kraus

Publisher: Basic Books, 2007;

ISBN-13 978-0-465-00218-4 (pbk. : alk. Paper)

ISBN-10: 0-465-00218-8 (pbk. : alk.paper)

This is available only in paperback or as in eBook for kindle software. The software is available as a free download from Amazon.com

Physics for Future Presidents: The Science Behind the Headlines; Author: Richard A. Muller
(Sep 21, 2009)

Publisher: W. W. Norton & Company, a Norton paperback, 2009

ISBN 978-0-393-33711-2 pbk

This is available only in paperback or as in eBook for kindle software. The software is available as a free download from Amazon.com

SPECIFIC COURSE OBJECTIVES

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- Develop the ability to identify the critical factors that influence an issue
- Develop a practical understanding of the scientific method and how to use it
- Develop a practical understanding of the basic principles of physics and how to use them to make informed real world decisions

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.

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 to 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/>

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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.

DISABILITY STATEMENT

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

ELECTRONIC DEVICES POLICY

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 Friday's of the week before they are due.
- From time to time other important information may also be posted there.
- Lecture slides will be posted following the lecture.

ACADEMIC INTEGRITY & CONDUCT

I have a zero tolerance policy for breaches of academic integrity. Cheating will result in an automatic failure for the course. Cheating includes but is not limited to the following examples:

- Copying or allowing someone to copy from another student's exam.
- Using someone else's clicker in addition to yours to register attendance or simulate their class participation. In this case all participants will receive a failing grade for the course.
- Bringing notes in any format or other form of assistance (other than that required and previously approved for reasons of a disability) to an exam
- Plagiarism, you may quote from a reference provided it is clear labeled as a quote and proper attribution is given. i.e. author, publication or other source and date.

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

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 someone has completed and turned in their exam **you will not be seated** and **you will not have the opportunity to take the exam at a later time.** There are **no exceptions** to this rule.
- You must take the final exam with you assigned section. This is a University rule. What is more the class is full so there are no extra seats to accommodate you.

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/.

INTELLECTUAL PROPERTY STATEMENT

Please note in this course from time to time I will utilize copyrighted materials under the "Freedom and Innovation Revitalizing United States Entrepreneurship Act of 2007" (Fair Use Act). Apart from such copyrighted materials, all other intellectual property associated with this course is owned and copyright protected 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 quizzes and exams, and Power Point presentations. No recording, copying, storage in a retrieval system, or dissemination in any form, whether electronic or other format, by any means of the intellectual property of the instructor, either in whole or in part, is permitted without the prior written permission of the instructor. When such permission is granted, it must specify the utilization of the intellectual property and all such permissions and waivers shall terminate on the last day of finals in the semester in which this course is held.

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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 for the availability of, or the content located on or through, external sites. Apart from materials used in accordance with the Fair Use Act, the instructor takes no responsibility for material that is otherwise offered at web sites and makes no warranty that such material does not infringe any third party rights. However, should any of this type of material be present and this fact is brought to the attention of the instructor, they will remove references to it from course materials.

PUBLIC SAFETY

WCU Department of Public Safety contact information:

Phone: (610) 436-3311. Website: <http://www.wcupa.edu/dps/>

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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	Homework, Projects and Exams
1/19/2016	Tuesday	Consider a Cow	
1/21/2016	Thursday	Tools for an Informed Decision-maker	
1/26/2016	Tuesday	Building on the shoulder of Giants I	Homework 1
1/28/2016	Thursday	A great Leap Forward	
2/2/2016	Tuesday	The language of Physics	Homework 2
2/4/2016	Thursday	Angular Motion	
2/9/2016	Tuesday	Angular Motion II	Homework 3
2/11/2016	Thursday	Theory and Fact & Review	
2/16/2016	Tuesday	Exam 1	Exam 1 - Homework 4
2/18/2016	Thursday	Project Day	Project 1 due
2/23/2016	Tuesday	Nine-Eleven & Risk Assessment	Homework 5
2/25/2016	Thursday	Terrorists & Nukes	
3/1/2016	Tuesday	The Art of Making Work (Heat as Energy)	Homework 6
3/3/2016	Thursday	A Little Magic I (Attraction and Repulsion)	
3/5/2016	Tuesday	A Little Magic II (Left out in the field)	Homework 7
3/8-10/2016	Spring Break		
3/15/2016	Tuesday	A Love Affair with Energy	Homework 8
3/17/2016	Thursday	Exam 2 Review	
3/22/2016	Tuesday	Exam 2	Exam 2 - Homework 9
3/25/2016	Thursday	Project Day	
3/29/2016	Tuesday	Sound and Light	Project II & Homework 10
3/31/2016	Thursday	Radiation	
4/5/2016	Tuesday	The Discovery of Radio Activity	Homework 11
4/7/2016	Thursday	Nuclear Power and Nuclear Fusion	
4/12/2016	Tuesday	Global Warming I	Homework 12
4/14/2016	Thursday	Global Warming II	
4/19/2016	Tuesday	Exam 3	Exam 3 - Homework 13
4/21/2016	Thursday	Thanksgiving Break	
4/26/2016	Tuesday	Space and SETI	Homework 14
4/28/2016	Thursday	Review	
5/3/2016	Tuesday	PHY 100-03 Final: 10:30 - 12:30, Mer. 112	
5/5/2016	Thursday	PHY 100-06 Final: 8:00 - 10:00, Mer. 112	