WEST CHESTER UNIVERSITY OF PENNSYLVANIA

ELEMENTS OF PHYSICAL SCIENCE—PHY 100-02—Fall, 2017
MWF 1:00-1:50 pm, Rm. Merion 109

Instructor: Dr. JoEllen McBride

Office: Schmucker Science Center South 402 / e-mail: jmcbride@wcupa.edu

—My office is on the Rosedale Ave. side of Schmucker Science Center—
—There is an elevator you can take to the 4th floor—

Office Hours (starting 2nd week): **Monday: 2:30 pm–4:00 pm**
Wednesday: 10:30 am–12:00 noon

—Any student who needs to meet outside the above office hours, please make an appointment—
—I may add or adjust office hours as the semester progresses—
—Occasional cancellations of office hours are likely—

Texts and Other Supplies—You must have WebAssign access for this course. The information is provided below and at the bookstore. The cost is $65. This costs pays for your telescope access so you can take images. You can purchase access via WebAssign's website after creating an account here www.webassign.net afterwards you will be asked to purchase WebAssign access. The bookstore probably marks up the price so I'm providing it below.

ISBN-13 = 1-928550-78-9
Prefix = ReichartAstroLab-S
TYPE = UNCAstro101L1

After you purchase access you can enroll in my course using the following course key: unc 8829 8019

The texts I will be using in this course are supplemental and free. They can be downloaded or accessed here:
College Physics - https://cnx.org/contents/Ax2o07Ul@9.78:HR_VN3f7@3/Introduction-to-Science-and-th
Astronomy - https://cnx.org/contents/LnN76Opl@13.2:_45u6IpQ@4/Introduction

Additional Item(s) Needed:
A *stand-alone* "scientific" calculator with trigonometric functions. There are apps available for the iPhone and Android devices which you can use during class. You can also buy pretty cheap ones. A graphing calculator is not necessary.

You must have a student account on the WCU computer network so that you can access postings on the "D2L" course information system and so that you can access university e-mail on the campus intranet. E-mail from the course instructor will come to you via the university e-mail system. Registering for a course at the University entitles you to such an account. Instructions for initializing your account can be found via the WCU

homepage: click the "Current Students" tab; choose "IT Help Desk"; among the list of items at the left, click on "New Student Account". Or go to the corresponding page by entering the following address:

http://www.wcupa.edu/infoservices/clientServices/itHelpDesk/studentAccount.aspx

Description of My Version of Physics 100: This course is a journey from the surface of the Earth to the edge of the Universe. The goal is for you to find your place throughout. There are four units: Earth, Solar System, Galaxy and Universe. In each unit we will define our place in it by first learning how past scientists figured out our location and then doing real time data collection and analysis to see it for ourselves. You will learn techniques that scientists use to come up with questions about and compute distances to objects that you will never touch. You will take images using telescopes that can be controlled over the internet. You will then analyze those images to learn about planets, stars, globular clusters, galaxies and so much more! By the end of the course you should have a feel for where we fit in the vastness of space.

The mathematics required for the course consists of basic algebra and geometry. It will be essential for the student to be able to use these skills. Correct use of a scientific calculator, especially in regard to order of operations, will also be essential. A small amount of trigonometry (the sine/cosine function) will be introduced and explained for limited use.

West Chester University General Education Goals and Student Learning Outcomes: PHY 100 is an approved course in the WCU General Education program. This course strives to have students meet the following general education goals: (Goal #2) ability to employ quantitative concepts and mathematical methods; (Goal #3) ability to think critically and analytically. These goals are accomplished through discussion of quantitative and qualitative examples and practice problems in class and outside class, through homework assignments, and through exams. The assignments and exams also provide evaluation of student accomplishment of these goals. Goal #3 is also addressed and evaluated through written answers to both open-ended and specific questions in a report on an assigned book on the social and technological impacts of physical sciences and engineering. Overall student learning outcomes are similar, but apply to specific course topics—for example, applying physical reasoning, quantitative reasoning, and mathematical skills to the refraction of light.

Course Calendar: A tentative course calendar is at the end of this syllabus.

Exams: At the beginning of each unit there will be a self-graded Pre-Test. This test is to see what you know about the topics that will be presented in the unit. At the end of each unit, there will be a graded Post-Test with similar questions to see how your knowledge has improved. This serves two purposes: 1) It lets me know if there is anything extra I need to go over on the topics presented or if there are topics that I can leave off and 2) it lets you see how your knowledge increased during the unit. A final purpose is to let me know how effectively I am teaching the material. Please see the tentative schedule for possible test dates.

The final exam date and time are set by the university and I am not allowed to vary that. If necessary, make-up finals can be arranged on an individual basis—for example, if a student has three finals scheduled on the same day.

Grading: I plan to grade on the following basis:
4 Post-Tests, 15% each
WebAssign assignments/Participation/Reflections, 20%
Final project, 20%.

I typically do stay with the preceding percentage weights when calculating overall course grades. I reserve the possibility of eventually varying these percentages if I think the outcome would better reflect the class's efforts;

but it is unlikely that they would change by more than 5%, if at all, and very unlikely that they would change by more than 10%. I may "curve" particular tests if I think that is appropriate, but again, I do not normally do this. My initial plan is for all tests included in the overall average to count equally, but I may vary this if it seems appropriate. I will let you know ahead of time if I consider any of the preceding class-wide changes.

Final numerical scores will be converted to letter grades according to the official scheme, but I may adjust the scheme based on how the class does and on how difficult I perceive the course to have been. I do consider whether to adjust the letter grades of students whose numerical scores are close to letter-grade boundaries, and considering factors such as unusual performance in some particular aspect of the course, major illness, etc.

Make-up Exams: I am willing to allow make-up of Post-Tests for sufficiently good reasons, such as illness or emergency. Missing the final exam will result in a zero for the exam unless extreme circumstances apply. **The following rules apply to making up Post-Tests:**

IMPORTANT: To limit possible abuse of the make-up test privilege, I will REQUIRE the following:

- **I must be notified in person or by e-mail by 5pm the day after the Post-Test, if you need to make up the test at another time for any reason.**
- **The make-up test must normally be taken not later than six days from the original test date. Exceptions will be made only for truly serious reasons, such as extended illness, and must be explicitly granted by me.**

If you miss a Post-Test without making it up in time and without an exemption from me, your grade for that Post-Test will be zero.

Regarding WebAssign Assignments: These will serve as your homework for the course. We will spend very little time on them in class. They will involve taking images with the PROMPT network of telescopes in Chile. Each lab has detailed videos and explanations on how to complete the tasks. It is your responsibility to use my office hours or contact me via email if you have trouble executing any part of the lab.

We will most likely be focusing on small parts of each lab at various points throughout the semester. There will be a due date for the entire lab though so you will have a limited time to complete it.

Practice Problems/Think-Pair-Share: I will not be assigning traditional homework problems. Qualitative and quantitative questions will be asked and answered in class. We will heavily utilize the Think-Pair-Share format where I ask a question of the class and you individually answer using D2L. Then you work together with your neighbors on the question and we come back as a class and see how your answers change on D2L. We will also utilize D2L so you can submit any explanation on why your answers changed. The purpose of this is to let you explain your thought process and see how knowledge changes as we take in new information or ideas. It also helps me see that you are using the concepts learned in class to answer questions. You will not be graded on correctness for these. They are more for participation and your benefit.

If this format doesn't work during class I may change it. Let's see how it goes first.

Daily Course Reflection: After some classes, you will be asked to reflect on what you learned during class that day. This is an opportunity to describe in your own words a concept we covered in class or explain to me what you found confusing. This will also count as participation. I will use your answers to see what concepts I need to cover in more depth if there was any confusion. There will usually be a prompt of some sort to get you started. All answers will be submitted on D2L.

Final Project: The last few class periods you will be presenting a final project. The project choices are listed below.
1) Take some detailed images, using the PROMPT telescopes, of an astronomical object of your or my choosing. You will use different filters to make a color image. From these images you will determine what physical processes are occurring in the object. You will present your findings to the class at the end of the semester and turn in a formal write-up during our final exam time. You can choose an object from this list of objects visible in the Southern Hemisphere (http://astropixels.com/caldwell/caldwellcat.html). You'll have to check if the objects are observable right now.
2) Find and research information about a scientist who contributed to the discoveries discussed in the course that wasn't mentioned. A good place to start looking is in the Multicultural Astronomy and Women in Astronomy PDFs I posted on D2L. Write a brief bio on the scientist and summarize their contributions. You will also present your findings to the class. Scientists that are not white, cis-gendered, able-bodied men are a bonus.

University's Statement of Excused Absences Policy for University-Sanctioned Events: Undergraduate students participating in University-sanctioned events such as, but not limited to, the Marching Band, musical ensembles, theatre group, athletic events, forensics competition, etc., will be granted an excused absence(s) by the respective faculty members for class periods missed. Students will be granted the privilege of taking, at an alternative time to be determined by the professor, scheduled examinations or quizzes that will be missed. The professor will designate such times prior to the event. Professors can provide a fair alternative to taking the examination or quiz that will be missed. Students must submit original documentation on University letterhead signed by the activity director, coach, or adviser detailing the specifics of the event in advance. Specific requirements include the following:

1. Responsibility for meeting academic requirements rests with the student.

2. Students are expected to notify their professors as soon as they know they will be missing class due to a University-sanctioned event.

3. Students are expected to complete the work requirement for each class and turn in assignments due on days of the event prior to their due dates unless other arrangements are made with the professor.

4. If a scheduled event is postponed or canceled, the student is expected to go to class.

5. Students are not excused from classes for practice on nonevent days.

The following are specifics for the student athlete:

1. The student athlete is expected, where possible, to schedule classes on days and at hours that do not conflict with athletic schedules.

2. Athletes are not excused from classes for practice or training-room treatment on nongame days.

Recently the University presidents of the Pennsylvania State Athletic Conference (PSAC) voted to allow athletic contests and championships to be played during the PASSHE final exam period. This new development may impact administration of finals, since multiple day championships will now occur during WCU's final exam week. Under WCU's Excused Absence Policy, any athlete who is participating in an athletic event or championship must be allowed to take, without penalty, any exam or quiz that they miss due to competition or be offered a fair alternative.

Disabilities and Special Needs: If you have a physical disability, learning disability, test anxiety, etc., please contact the Office of Services for Students with Disabilities (OSSD) at extension 3217 and bring the resulting documentation to me to discuss how the university and I can assist you. Note that sufficient notice is needed in order to make accommodations possible.

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 students who may have questions regarding these rights. Ms. Lynn M. Klingensmith, Director of Social Equity/Title IX Coordinator, has been designated in this role. Any students who may need assistance with their rights to accommodations should contact her at lklingensmith@wcupa.edu.

If you are approved for an accommodation of a disability, please provide me the documentation in a timely manner. Even if you think you may not need the accommodation for this course (such as extra time for exams), please provide the documentation—it may well turn out that you need the accommodation after all! If you need to contact OSSD for the documentation, do so AS SOON AS POSSIBLE. Delaying exams or other coursework while awaiting documentation will make the work more difficult later! See my similar note below regarding tutorial help (next subsection).

Tutoring: Tutoring for PHY 100 is offered by the Learning Assistance Center (LARC), 223 Lawrence Center, x2535. More information is available at: http://www.wcupa.edu/ussss/larc/. LARC tutoring is free of charge, but you must sign up at the beginning of the semester.

Peer tutoring may also be offered by physics majors during the semester. If offered, this will not be organized until a few weeks into the semester. I will provide information as I learn about arrangements. A few weeks into the semester you could also inquire at the Physics Library, Merion 125, where the physics major hang out.

If you realize you need tutorial help, arrange it as soon as possible, and keep up with it. Delaying or missing tutoring appointments will lead to greater difficulty later. If you need tutoring in connection with a learning disability, see my similar note above under the "Disabilities and Special Needs" subsection.

ADDITIONAL NOTES:

You, Me, and the Course: You are responsible for spending the "time on task" to do the work you need to do for this course. A teacher can encourage "active learning," but active learning must be done by the student. If thinking of the entire semester at once is burdensome, focus on the current material!

I do not expect to provide "extra credit" work late in the semester. If you are tempted to hope for or rely upon "extra credit work" to pull you through, think of the current course material as your extra credit work as we go through the semester. I do understand that there may be many demands on your time, and I will try to be understanding and flexible. For grades to be meaningful as indicators of student performance, however, they

must be based primarily on mastery of the course material and assignments, secondarily on effort made to achieve mastery, and, perhaps, thirdly on other factors.

I am very willing to provide help and explanations inside and outside the classroom (see "Office Hours" in the header information on page one). Whether you are a recent high-school graduate or working on starting a second (or third!) career, I'm interested in you. Students have found me to be very helpful in one-on-one and small group situations, so walk in or make an appointment to see me if you need help.

Electronics in the Classroom: This course relies heavily on electronics. You are free to use your cell phone as a scientific calculator and you are allowed to bring a laptop or tablet to class if you want to work on the WebAssign assignments or answer the D2L questions in class. This will require you to be responsible though. I trust that y'all are adults and can handle this. I will let you know when a particular part of class will require your calculator or laptop. The rest of the class, I expect you to have your computers closed (unless taking notes) and your cell phones face down and on vibrate. You are free to answer an important call but please leave the class when doing so. You can leave and re-enter the class at any point. Do your best to stay off social media unless it's to tweet, ig, snap or facebook how awesome my class is ;)

Recording in Class: You must obtain permission from me before recording class. Video recording requires permission of your classmates as well. Any on-line posting of such recordings, or circulation of such recordings to people not enrolled in the course, is *forbidden*, unless *additional special permission* is granted.

Academic 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 automatic failure and removal from this course.

For questions regarding 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.

Intellectual Property Statement: The instructor for this course utilizes 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.

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 the instructor 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 on 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: The Emergency Communications Committee recommends that the telephone number of WCU's Department of public safety be available on every course syllabus.

WCU Department of Public Safety: (610) 436-3311.

The University encourages students to sign up for the University's free WCU ALERT service, which delivers official WCU emergency text messages directly to your cell phone (as well as via email). For more information, visit https://www.wcupa.edu/wcualert/.

University Statement Regarding Title IX of the Education Amendments of 1972, Including Policy on Faculty Reporting Incidents of Sexual Assault: 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, found at internet address http://www.wcupa.edu/_admin/social.equity/.

LGBTQA Ally Statement: West Chester University's Mission Statement says, in part, "*We appreciate the diversity the members of our community bring to the campus and give fair and equitable treatment to all; acts of insensitivity or discrimination against individuals based on their race, gender, ethnicity, age, sexual orientation, abilities, or religious beliefs will not be tolerated*."

Based on West Chester University's commitment to diversity, I believe that everyone in my classroom should feel safe. In becoming an ally I made the commitment to offer a safe space for *all* of my students, not just those who identify as LGBTQ. You may speak to me confidentially about issues of sexual orientation or gender identity during my office hours, but I have no professional expertise in these matters. For further advice or information, I recommend contacting Ms. Sherry Mendez, Interim Director of LGBTQA Services (smendez@wcupa.edu, 610-436-0732), or University Counseling and Psychological Services (wcucc@wcupa.edu, 610-436-2301).

Green Dot Statement: WCU Faculty, Staff, and Students believe in creating a community free from interpersonal violence, including sexual assault, partner violence, and stalking, in which all members feel safe and respected. I believe each student deserves a safe environment to pursue an education and I understand the devastating impact forms of power-based personal violence (i.e. sexual assault, dating/domestic violence, and stalking) may have. I am dedicated to make our campus safe. If you'd like to know more about Green Dot, our campus's bystander intervention program, please ask!

Please know that all faculty on campus are mandatory reporters. This means that if you disclose any experience of sexual misconduct to me outside of a classroom discussion, a writing assignment, or as

part of a University-approved research project, I must report the experience to WCU's Title IX Coordinator, Lynn Klingensmith (lklingensmith@wcupa.edu).
If you or someone you know has experienced stalking, partner violence or sexual assault, please know, you are not alone. You can find confidential resources at the following link:
https://www.wcupa.edu/_services/greenDot/toolsResources.aspx

Tentative Course Calendar:

Week	Starts on Monday,	Coursework, Exams, and Other Events
1	Aug. 28	Introduction, syllabus. **Begin Earth Unit: Pre-test** How do we define location
2	Sep. 4	Earth – Distances on Earth, getting around Earth Parallax on Earth ***[No class Sep. 4: Labor Day]***
3	Sep. 11	Moon – Distance to Moon, getting to the Moon **End of Earth Unit: Post-test**
4	Sep. 18	**Begin Solar System Unit: Pre-test** Sun – Distance to Sun, getting to the Sun Parallax in Solar System
5	Sep. 25	Light – How we learn about stuff in space Learn how to use Skynet and Afterglow
6	Oct. 2	Planets – Distance to planets, getting to planets, how to measure information about planets
7	Oct. 9	Measure the mass of a planet **End of Solar System Unit: Post-test** ***[Semester Break: Week of Monday, October 9]***
8	Oct. 16	**Begin Galaxy Unit: Pre-test** Stars – Distance to stars, getting to stars Parallax to stars
9	Oct. 23	Exoplanets, other things we see – Distances, getting there Standard Candles
10	Oct. 30	Milky Way galaxy – where we fit in it
11	Nov. 6	**End Galaxy Unit: Post-test**
12	Nov. 13	**Begin Universe Unit: Pre-test** Galaxies – Distances to galaxies, getting to galaxies, how do we measure info about galaxies
13	Nov. 20	***[No Class Nov. 22-24: Thanksgiving Break]***
14	Nov. 27	Universe – Structure, what's in it, how did it get here and where is it going? Big Bang
15	Dec. 4	**End Universe Unit: Post-test** **Start Final Project Presentations**
16	Dec. 11	**Continue Final Project Presentations**

Our Final Exam time is 1:00–3:00 pm, Fri., Dec 15, in our classroom, Mer 109.

We will use this time to finish up any presentations we didn't get to and for you to hand in your formal write-up of your final project. We may also watch a movie to give you a break from studying.