Physics 321 – Physics for Future Presidents **Unique number 55010**

Spring 2020, Tuesdays and Thursdays from 2pm-3:30pm, in Painter 4.42

Instructor: Professor Vernita Gordon, gordon@chaos.utexas.edu, office **RLM 14.206**. Office Hours **Mondays 2pm-3pm, Tuesdays 3:30pm-4:30pm**, **Fridays 1pm-2pm,** or by appointment. Email me to request an appointment. If I need to cancel some office hours, I will announce this *via* email and/or Canvas.

Graduate Teaching Assistants: Saba Baig sbaig@utexas.edu, Stacie Moltner staciemoltner@utexas.edu, Joel Larakers j_larakers@utexas.edu

Undergraduate Learning Assistants: To Be Determined.

Required Textbook: Physics and Technology for Future Presidents: An Introduction to the Essential Physics Every World Leader Needs to Know by **Richard A. Muller. You are required to read the book before coming to class, according to the schedule at the end of this handout.** I believe either a hardcopy or an electronic copy (which is available as a rental e-textbook) should be fine. Please pay careful attention to the title when buying your book – this is NOT the same book as Physics for Future Presidents: The Science Behind the Headlines, even though it has the same author. There are also two copies of the textbook available through the UT Austin library. If you're curious about what this book is like, you can watch a video of the author giving a presentation about the class he developed along with the book: **https://physics.berkeley.edu/physics-for-future-presidents**

Required video watching: https://cosmolearning.org/courses/physics-10-physics-for-future-presidents/. **You are required to watch the assigned videos before coming to class, according to the schedule at the end of this handout**. You have the option to watch videos on your own or at a Watch Party hosted by a Graduate Teaching Assistant, with discussion afterward. I think that the Watch Parties will help you get more out of the videos than watching them on your own. To set the times for the Watch Parties, we will use a Doodle poll to find the times that work for the most students. **Please fill out the Doodle poll at this link (https://doodle.com/poll/rgz52vp7sa9tdfvi) to indicate when you would participate in on-campus Watch Parties. Please do this ASAP (the first week of class) so that we can start Watch Parties for the second week of class.**

Structure of the class: There will be **daily in-class quizzes** based on the assigned reading from the textbook and the assigned video, and on approximations/back-of-the-envelope calculations/Fermi problems as discussed in class. Quizzes will be open book, and you can work on them with your classmates, if you wish (although each student must turn in his/her own work). The instructor and TAs will circulate to offer help during the quizzes. The **midterms and final exam will be similar to the in-class quizzes**, although you will have to work the midterms and final on your own, without help from other people or the book. *Thus, the purpose of the daily in-class quizzes is to help you internalize the material so that you do well on the exams.*

Weekly, you will be required to submit a short (~2 paragraph) paper responding to a news article on a scientific topic from a credible source. Examples of credible sources include The New York Times, The Economist, The New Scientist, Scientific American. If you're not sure if a source is credible, check with the instructor. In your response paper, first *summarize* the content of the article and then *evaluate* it. Evaluate means addressing questions such as: is it biased? Do you have suspicions about its accuracy? Is relevant information omitted? What broader implications does this have? What questions does this open up? The Teaching Assistants will demonstrate how to critically evaluate a science news article in the first week of class. *The purpose of these assignments it to help you develop the habit of regular, thoughtful engagement with science.* **Once in the semester**, each student will present a science news article or a scientific article to the class. Presentations should be ~15 minutes long, including time to answer questions from the class. *The purpose of these presentations is to help you learn how to present a specialized topic to a broad audience in a succinct and clear way.* Sign up for a day to present here: https://doodle.com/poll/648ugyixcxfe3k5i

On weeks that you have a midterm, you are not required to submit a response paper. When the instructor is absent you will have a guest speaker and there will not be in-classes quizzes on those days unless specifically announced otherwise.

Grading: Plus/minus grading will not be used. Grades will be calculated as follows:

15% Midterm 1, 15% Midterm 2, 20% Final Exam, 15% science article response papers, 15% in-class presentation, 20% in-class short quizzes

Time Management: Poor time management is an obstacle to academic success for many students, but you can overcome this. **Using your time efficiently and proactively will make your college experience more productive AND more enjoyable.** Dates for all assignments and exams for this class are listed in the schedule at the end of the handout. If you don't use a calendar already, buy a paper calendar or use a calendar on the Internet (Professor Gordon uses Google Calendar for her time management). Mark ALL your classes and ALL your assignments and exams on your calendar. Mark all your other important commitments as well. **Check your calendar daily** to see what you have coming up so you can plan how best to use your time. **Explicitly block out time for studying, meals, recreation, socialization, and sleep.**

Communication: The instructor will sometimes communicate with the class through email, Quest, and/or Canvas. These are official communications and may include information that could affect your grade in the course. **You are responsible for checking email**, at least daily, at the address the University has on file for you. **You are responsible for checking Canvas and Quest** at least daily.

Hard things happen. Sometimes, through no fault of your own, a circumstance may arise that hurts your ability to do well in class. Examples include, but are not limited to, the death or

serious illness of a family member or close friend, your own serious illness (physical or mental), a serious accident or natural disaster. I hope nothing like this happens to you this semester. If it does, **I want to help** (and, likely, so do your professors in other courses). You should contact Student Emergency Services (http://deanofstudents.utexas.edu/emergency/) and discuss your situation with them. If they decide it is warranted, based on information, and possibly documentation, that you provide, they will contact me and your other professors, and tell us that your circumstances are such that I would be justified in being flexible with the course requirements in your case. **They will not give me any specifics about your situation**, so your privacy will be protected. Then, you and I can have a conversation about what adaption would be most appropriate in your case.

Appropriate Communications: Learning how to communicate appropriately and professionally with professors and others in positions of authority is likely to give you a better experience in college and in your post-college career. "Professor LastName" or "Dr. LastName" are appropriate ways to address faculty, in person or over email. My last name is "Gordon" and I like to be addressed as "Professor Gordon" or "Doctor Gordon". Think of writing emails to professors as if you were writing a letter, not a text message or IM. In writing emails, please use the subject line to tell your professor, as specifically as possible, what the email is about. Begin the email with a salutation, and use standard English spelling and grammar throughout. Please be as concise as you can while still saying what you need to say. End with a closure and your name.

Honor Code: The core values of the University of Texas at Austin are learning, discovery, freedom, leadership, individual opportunity, and responsibility. Each member of the University is expected to uphold these values through integrity, honesty, trust, fairness, and respect toward peers and community.

Academic dishonesty: Academic dishonesty includes, but is not limited to, copying answers on exams or homework, having another person do homework, exams, or iClicker attendance for you, or bringing non-allowed aids to exams. Collusion in another's academic dishonesty is itself academically dishonest. Generally speaking, academic dishonesty is any activity that misrepresents another person's work as one's own, or that is intended to circumvent the intended purpose of evaluation tools like exams, homework, and iClicker quizzes. Don't do this. Cases of suspected academic dishonesty will be reported to the Office of the Dean of Students.

Cell phones and other electronic devices: Cell phones should always be silenced in the classroom. If there is an urgent or emergency call that cannot wait until after class, please exit the classroom and close the door before answering your phone. Please re-enter the classroom after the call in the way described above to minimize disruption to your classmates. Laptop and tablet computers should be silent in the classroom and should be used courteously. Cell

phones, computers, graphing calculators, and other electronic devices with potential for facilitating cheating are not allowed during exams. Scientific calculators are allowed during exams.

Students with disabilities: Students with disabilities may request appropriate academic accommodations from the Division of Diversity and Community Engagement, Services for Students with Disabilities, 512-471-6259, http://www.utexas.edu/diversity/ddce/ssd. Students who need special accommodation must notify the instructor no later than the 12th day of class.

Religious holidays: If you will miss class because of a religious holy day, you must notify the instructor of your pending absence at least fourteen days prior to the date of observance of a religious holy day and no later than the 12th day of class. If you must miss a class, an examination, a work assignment, or a project in order to observe a religious holy day, you will be given an opportunity to complete the missed work within a reasonable time after the absence.

Adding and Dropping the Course: See the UT Austin Academic Calendar, https://registrar.utexas.edu/calendars/19-20. During the first four class days, students may add and drop courses using the Registrar's online service. During class days 5-12, students may drop courses online but must get departmental permission to add the course. For this course, you should contact the physics department. Some departments may not allow add/drops after the fourth class day. If you wish to add a course after the twelfth class day, you must go to the Student Division of the Dean's Office (1st floor of WC Hogg) to provide justification for the proposed change. You must have written permission and documentation of class attendance from the instructor and approval from the department.

Academic Q-drop: See the UT Austin Academic Calendar. If you want to drop this course after the 12th class day and before the Q-drop deadline, you must get the forms from the Dean's Office (WCH 1.106) or your departmental advising center and ask the instructor to sign the drop form.

Nonacademic Q-drop: Students who have substantiated nonacademic reasons, as determined by the Dean's Office, may be able to drop a course. Students with significant nonacademic problems, such as extended health difficulties or family emergencies, are encouraged to contact the Dean's Office. The course instructor cannot give permission for a nonacademic Q-drop.

One-time Drop: Once in his/her undergraduate career, a student who has completed at least two long semesters at UTAustin can drop a class or all classes in a semester at any point until the last class day. A student may drop a class only if he or she has an average grade of D+ or below in the class at the time of the request and if there are no pending investigations of

scholastic dishonesty for the course in question. More information is available here: http://www.utexas.edu/faculty/council/2010-2011/legislation/EPC_OTE.html

Safety in Emergency Situations: Occupants of buildings on The University of Texas at Austin campus are required to evacuate buildings when a fire alarm is activated. Alarm activation or announcement requires exiting and assembling outside. Familiarize yourself with all exit doors of each classroom and building you may occupy. Remember that the nearest exit door may not be the one you used when entering the building. Students requiring assistance in evacuation shall inform their instructor in writing during the first week of class. In the event of an evacuation, follow the instruction of faculty or class instructors. Do not re-enter a building unless given instructions by the following: Austin Fire Department, The University of Texas at Austin Police Department, or Fire Prevention Services office. If you have concerns about the behavior of a member of the campus community, you may call the Behavior Concerns Advice Line (BCAL): 512-232-5050. Link to information regarding emergency evacuation routes and emergency procedures can be found at: www.utexas.edu/emergency

Please see the next page for the course schedule.

PLEASE DO EACH DAY'S ASSIGNED READING AND WATCH THE ASSIGNED VIDEO BEFORE YOU COME TO CLASS. VIDEOS ARE AVAILABLE ONLINE AT https://cosmolearning.org/courses/physics-10-physics-for-future-presidents/. Video Watch Parties are a great way to get more out of the videos by discussing them with your classmates and a graduate Teaching Assistant. Help determine the best time for Watch Parties by completing this Doodle poll ASAP: https://doodle.com/poll/rgz52vp7sa9tdfvi

Date	Video	Reading	Assignment
1/21 Tues	Introduction to the Class	*Please read Chapter 1 after class*	
1/23 Thurs	Atoms and Heat I	Chapter 2	
1/28 Tues	Atoms and Heat II	Chapter 2	
1/30 Thurs	Gravity and Satellites I	Chapter 3	Science article response papers due
2/4 Tues	Gravity and Satellites II	Chapter 3	
2/6 Thurs	Radioactivity I	Chapter 4	Science article response papers due
2/11 Tues	Radioactivity II	Chapter 4	
2/13 Thurs	Nukes	Chapter 5	Science article response papers due
2/18 Tues	Review Session I	Study for the midterm	Midterm 1
2/20 Thurs	Electricity and Magnetism I	Chapter 6	
2/25 Tues	Electricity and Magnetism II	Chapter 6	
2/25 Thurs	Waves I	Chapter 7	Science article response papers due
3/3 Tues	*Guest Speaker – no video assignment*	*Reading selected by guest speaker*	
3/5 Thurs	Waves II	Chapter 7	Science article response papers due
3/10 Tues	Light I	Chapter 8	
3/12 Thurs	Light II	Chapter 8	Science article response papers due
SPRING BREAK			

3/24 Tues	*Guest Speaker – no video assignment*	*Reading selected by guest speaker*	
3/26 Thurs	*Guest Speaker – no video assignment*	*Reading selected by guest speaker*	Science article response papers due
3/31 Tues	Invisible Light I	Chapter 9	
4/2 Thurs	Invisible Light II	Chapter 9	Science article response papers due
4/7 Tues	Quantum I	Chapter 11	
4/9 Thurs	Quantum II	Chapter 11	Science article response papers due
4/14 Tues	Quantum III	Chapter 11	
4/16 Thurs	Quantum IV	Chapter 11	Science article response papers due
4/21 Tues	Review Session II	Study for Midterm	Second Midterm
4/23 Thurs	Relativity I	Chapter 12	
4/28 Tues	*Guest speaker – no video assignment*	*Reading chosen by guest speaker*	
4/30 Thurs	Relativity II	Chapter 12	Science article response papers due
5/5 Tues	Universe I	Chapter 13	
5/7 Thurs	Universe II	Chapter 13	Science article response papers due
TBA	**Review for Final Exam**	**All Assigned Chapters**	
Final Exam	**Our default final exam time is Tuesday, May 19, 9am-noon** **Check the Registrar's Website about four weeks before the semester ends to confirm the final exam time.**	**Check the Registrar's Website about four weeks before the semester ends to confirm the final exam location.**	