**PHY 231 - PHYSICS & TECHNOLOGY FOR FUTURE PRESIDENTS  FALL 2023**

INSTRUCTOR: PROFESSOR ABHAY L. DESHPANDE

Co-Instructors\*\*: Dr. Charles-Joseph Naim

**Class When:**Tuesday & Thursday 1:00-2:20 PM

**Where:**Humanities 3017

**Remote/In-Person:**This class will be held **in-person.**

**Course Description:**The aim of this course is for you to learn how science addresses the most important societal issues facing our planet.

**Scientific Objective:**

* To understand the fundamental science of energy, energy usage in the world, and the human impact on the global climate
* To learn, through process of discovery, how science formulates questions, and addresses them with evidence based reasoning
* To address specific questions which must be asked and answered in order to understand the important societal questions of energy usage and environmental impact
* To learn about other issues with strong physics content such as satellites, space, quantum devices, nuclear energy in the context of weapons, global threats due to terrorism, etc.
* We will take on all issues that a potential conscientious leader of a world, country, government agency, public or private company, a citizen's representative may have to take on to make good decisions. We will learn how to address issues even when one is not the world expert in all issues.

At the completion of this course you should have improved ability to:

* Look at complex issues and identify (break them down in to) basic science questions and correlate them to the impact on and is impacted by the political, social, economic, and ethical dimensions
* Understand the limits of scientific knowledge
* Critically evaluate scientific arguments in the context of societal impact
* Ask good questions
* Find information using various resources, and evaluate their veracity
* Communicate scientific ideas clearly
* Relate to science in various personal situations

**TEXT (to be roughly followed): *Physics and Technology for Future Presidents by Richard Muller***

(I use their digital book, cost significantly lower than a physical hardcover or softcover book).

**Clickers: Turning Point Technologies (or equivalent suggested by the University)**

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**Attendance Policy:**Attendance is **required**. This will be an interactive class, with in-class group activities and responses. Your attendance is critical to your success and of this class. Participation in the class is part of your grade. Attendance will be based on a sign-up sheet in class or/and the responses to the Turning Point questions for the day.

**Reading:**There will be reading assignments to be completed before the class, and sometimes short assignment (short answer to a single question) related to the reading. There will be discussions related to the reading in the class, so be sure to read! You may be asked about it.

**Homework:**Two components to the homework. 1) Approximately, every alternate week you will find a link relevant and submit a link related to the media coverage of topic of discussion that you find interesting/compelling and related to our class: you should be ready to discuss this in the class. **H**[**ere is a link**](http://www.andrew.cmu.edu/course/33-115/resources.html) to a large number of interesting sources compiled by a professor at Carnegie Mellon University. 2) Other homework will be assigned as we go through the course, at approximate frequency of once-every-two weeks. Late homework will not be accepted.

**Project/Presentations:**There will be one group project presentation (by a group of ~5 students) in early October, and another one project/presentation by the same group in a topic that interests you most, due early December.

**Extra Help and Office Hours:**I will be available to discuss things at the end of each lecture for additional half an hour. If you need more, we will make appointments as needed.

\*\* Co-instructors are research physicists at Stony Brook, who will step in place of Prof. Deshpande, should he have to travel during the semester.

**Grading:**

Midterm exams (2) : 15% of the grade each

Attendance: 10%

Final Exam 40%

Group Presentations (2): 10% each

**Helpful tips for a high grade in this class:**

1. Read the assignments before class and refresh yourself after
2. Do the homework. There will be about 3-5 homework assignments during the course. You may collaborate on homework assignments, but final write-ups (if there are any) cannot be identical, you need to write your own. Please also mention who you worked/collaborated with on your assignments.
3. Attend class: Interactive nature of this class demands that you attend all of them and participate. Turning Point Clickers will be used intermittently and occasionally to assess your understanding and will measure your class participation.
4. Talk to your classmates and family, and friends about this class. This will prepare you for future (and successful in this class) to explain science to society. It will also prepare you to ask good questions on conversations. Presidents are leaders, and leaders need to convey their points of view effectively and successfully to others, who are not necessarily with you. Practice this skill to become an effective leader.
5. Ask questions in class: there are NO stupid questions... I may not know all answers but in such cases, you will help me find the right answers for the future students of this class. You will learn from me and I will, from you.

**Important Dates**:

First Class on: August 29, 2023

Midterm Exam 1: Early October, 2023

Midterm Exam 2: Early November 2023

Thanks Giving: No class November 23, 2023 (**no class**)

Last Class: December 2, 2022

Final Examination: **in-class-time:** December 5 or 8, 2021

Final Presentation: Dates: (detailed to be decided later)

If you cannot attend a class due to any reason (religious holiday or official university business) please let me know before the 1st midterm. Only medical emergencies can be accommodated without penalty, and I will need a note from the SBU Clinic or your physician. If you miss an exam because of a valid reason, a make-up exam will be offered.