

PHY 307(C)- Modern Physics
University of Tampa
Fall Term 2019
Syllabus

Instructor: Prof. Simon Schuler
Office: GHS 539
Email: sschuler@ut.edu
Phone: 813.257.3362

Class Meetings: MWF 10:00 - 11:10 am
GHS 619

Text: Modern Physics for Scientists and Engineers (2nd edition)
–Taylor, Zafiratos, & Dubson (University Science Books)

Prerequisites: PHY 201 or PHY 206; MAT 260

Office Hours: T 10:00 am - 12:00 pm
R 10:00 am - 12:00 pm
* Feel free to stop by my office anytime; I may or may not be available
* Meetings can also be arranged by appointment

Course Description

Modern Physics is a course that generally deals with the physics of the 20th century and beyond. Some physicists, in fact, believed that by the end of the 19th century we had learned all there was to know about physics and future research efforts would only be necessary to increase the precision of what was already known. They were wrong! Physicists such as Albert Einstein, Max Planck, Niels Bohr, Marie Curie, Albert Michelson, Ernest Rutherford, Erwin Schrödinger, and others were getting experimental and theoretical results that were not explicable by what would become to be known as Classical Physics. The work done by this amazing group of physicists (those listed won a combined eight Nobel Prizes!) and others would lead to the incredible theories of Special and General Relativities, and Quantum Physics, both of which dramatically changed our understanding and perception of the Universe.

Some of the topics we will cover this semester include:

- Special Relativity
- Quantum Mechanics
- Atomic Theory
- Statistical Physics
- Nuclear Physics

The structure of the course will consist primarily of lectures, discussions, and problem solving in class. You will be expected to participate in class discussions. Not doing so could adversely affect your final grade in the class.

Learning Objectives

At the end of this course, you will have gained:

- 1) an advanced understanding of the main principles of special relativity and quantum mechanics, as well as atomic and nuclear physics, and statistical mechanics.
- 2) an improved proficiency in problem solving using calculus.
- 3) an ability to communicate an understanding of modern physics, its myriad implications, and its successes in terms of describing the physical Universe.

Grading

Your grade for the course will be based on your performance on Homework assignments, Midterm Exams, and a Final Exam.

Homework (HW)– homework will be assigned regularly throughout the semester. The best way to learn physics is by doing problems, and Modern Physics is no different. Homework assignments will include solving quantitative problems from the text and other sources.

Midterm Exams– there will be three in-class midterm exams. The exams will consist of quantitative problems similar to homework problems.

Final Exam– there will be a semi-comprehensive final exam at the end of the term. The structure of the final exam will be similar to that of the midterms. The final for this course is scheduled for **Wednesday, December 11 at 11:00 am - 1:00 pm**.

*The midterm and final exams will be weighted equally.

Your final grade will be computed from the averages of your individual HWs and Exams with the following weights:

HWs	30%
Exams	70%

Final grades will be assigned according to the scale:

90 – 100%	A	72 – 77.9%	C
88 – 89.9%	AB	70 – 71.9%	CD
80 – 87.9%	B	63 – 69.9%	D
78 – 79.9%	BC	< 63%	F

Academic Integrity

Academic dishonesty (cheating, plagiarism, fabrication, and academic misconduct) is not tolerated at any level by me or the University. It is the students responsibility to become familiar with the policies of the University regarding academic integrity and to avoid violating such policies. Policy information can be found at <http://ut.smartcatalogiq.com/en/current/catalog/Academic-Policies-and-Procedures/Academic-Integrity-Policy>.

All Homework assignments, reading quizzes, and Exams are to be done independently by each student. While I encourage you to study together, talk with each other about what we are learning in class, and work together on homework sets, any work turned in for grading must be completed solely by you. Any student found violating the Academic Integrity Policy (e.g., cheating on an exam, copying another student's homework or a solution found online on tutoring websites such as Chegg or other sources, etc.) will **fail the course (receive a letter grade of "F") without exception**. An Academic Integrity Violation Form will also be submitted to the Office of the Associate Provost which may take additional action, including possible expulsion.

Attendance

Although I expect you to attend every class meeting, I do not take attendance in class. That means you do not have to come to class if you do not want to come. However, missing class is not free from consequences. **You are responsible for any and all material covered**, and any and all announcements made during each class, whether you are here or not. Remember, any material covered in class is fair game for the exams, and not all material covered in class appears in the text. Furthermore, routinely missing class will adversely affect the class participation component of your grade.

General Classroom Policy

In order to ensure an environment that is conducive to learning, all electronic devices such as cell phones, smart watches, iPods, iPads, tablets, etc. should be turned off during class. **PLEASE DO NO TEXT DURING CLASS!** Texting during class is inconsiderate to me and to your fellow students, and it is disruptive. Using any of these electronic devices during class will adversely affect the class participation component of your grade. Using computers during class is also not permitted unless you have proper documentation for its use from the Academic Success Center (please see below).

Class Disruption Policy

Every student has the right to a comfortable learning environment where the open and honest exchange of ideas may freely occur. Each student is expected to do his or her part to ensure that the classroom (and anywhere else the class may meet) remains conducive to learning. This includes respectful and courteous treatment of all in the classroom. According to the terms of the University of Tampa Disruption Policy, the professor will take immediate action when inappropriate behavior occurs.

Campus Closure Statement due to Adverse Conditions

In case of any adverse condition or situation which could interrupt the schedule of classes, each student is asked to access www.ut.edu for information about the status of the campus and class meetings. In addition, please refer to ut.blackboard.edu for announcements and other important information. You are responsible for accessing this information.

Students with Disabilities

If there is any student who has special needs because of a disability, please go directly to the Academic Success Center in North Walker Hall to report your needs and provide documentation of your disability. You may also phone 813.257.5757 or email disability.services@ut.edu for assistance. Please feel free to discuss this issue with me, in private, if you need more information.

Reporting Sexual Violence / Title IX Matters

Sexual violence includes nonconsensual sexual contact and nonconsensual sexual intercourse (which is any type of sexual contact without your explicit consent, including rape), dating violence, sexual harassment, sexual exploitation, domestic violence, and stalking. You may reach out for confidential help (see contact info below) or report an incident for investigation.

If you choose to write or speak about an incident of sexual violence and disclose that this violence occurred while you were a UT student, the instructor is obligated to report the incident to the Title IX Deputy Coordinator for Students. The purpose of this report is to provide a safe and nondiscriminatory environment for all students. The Deputy Coordinator or his or her designee will contact you to let you know about the resources, accommodations, and support services at UT and possibilities for holding the perpetrator accountable. If you do not want the Title IX Coordinator notified, instead of disclosing this information to your instructor, you can speak confidentially with the individuals listed below. They can connect you with support services and discuss options for holding the perpetrator accountable.

There is an exception to this required reporting for preventative education programs and public awareness events or forums. While the instructor is not required to report disclosures during these instances, unless you make or initiate a complaint, during these programs or events, the instructor or another University official will ensure that the students are aware of the available resources at UT, such as counseling, health, and mental health services, and it will provide information about Title IX, how to file a Title IX complaint, how to make a confidential report, and the procedure for reporting sexual violence.

For more information, see The University of Tampa Title IX resources at <http://www.ut.edu/uploadedFiles/Academics/Provost/Title%20IX.pdf> and <https://www.ut.edu/studentconduct/titleix/>.

To make a confidential report of sexual violence, please contact:

- The Victims Advocacy Hotline:(813) 257-3900
- Dickey Health & Wellness Center (wellness@ut.edu)813.257.1877
- Health and Counseling Center (healthcenter@ut.edu)813.253.6250

Tentative Class Schedule

This is a general outline of the chapters in the text that we will be covering in class and on what dates. Tentative dates for the Midterm Exams and the Final Exam are also provided. This is a tentative schedule (except for the Final Exam). We may deviate from this schedule at any time.

NEED AN EXTRA DAY FOR THE SPACE AND TIME OF RELATIVITY (CH.1)

Week	Monday	Wednesday	Friday
1 Aug 26/28/30	Class Introduction; Classical Physics Review	The Space and Time of Relativity (Ch.1)	The Space and Time of Relativity (Ch.1)
2 Sep 2/4/6	No Class- Labor Day	The Space and Time of Relativity (Ch.1)	Relativistic Mechanics (Ch.2)
3 Sep 9/11/13	Relativistic Mechanics (Ch.2)	Relativistic Mechanics (Ch.2)	Midterm Exam 1 Chs. 1&2
4 Sep 16/18/20	Atoms (Ch.3)	Atoms (Ch.3)	Quantization of Light (Ch.4)
5 Sep 23/25/27	Quantization of Light (Ch.4)	Quantization of Light (Ch.4)	Quantization of Atomic Energy Levels (Ch.5)
6 Sep 30/ Oct 2/4	Quantization of Atomic Energy Levels (Ch.5)	Quantization of Atomic Energy Levels (Ch.5)	Matter Waves (Ch.6)
7 Oct 7/9/11	Matter Waves (Ch.6)	Schrödinger Equation in One Dimension (Ch.7)	Schrödinger Equation in One Dimension (Ch.7)
8 Oct 14/16/18	Schrödinger Equation in One Dimension (Ch.7)	Midterm Exam 2 (Chs. 3 – 7)	3D Schrödinger Equation (Ch.8)
9 Oct 21/23/25	3D Schrödinger Equation (Ch.8)	3D Schrödinger Equation (Ch.8)	Electron Spin (Ch.9)
10 Oct 27/30/Nov 1	Electron Spin (Ch.9)	Multielectron Atoms (Ch.10)	Multielectron Atoms (Ch.10)
11 Nov 4/6/8	Atomic Transitions; Radiation (Ch.11)	Atomic Transitions; Radiation (Ch.11)	Midterm Exam 3 (Chs. 8 – 11)
12 Nov 11/13/15	Statistical Mechanics (Ch.15)	Statistical Mechanics (Ch.15)	Statistical Mechanics (Ch.15)
13 Nov 18/20/22	Statistical Mechanics (Ch.15)	The Structure of Atomic Nuclei (Ch.16)	The Structure of Atomic Nuclei (Ch.16)
14 Nov 25/27/29	Radioactivity/Nuclear Reactions (Ch.17)	No Class- Thanksgiving Holiday	No Class- Thanksgiving Holiday
15 Dec 2/4/6	Radioactivity/Nuclear Reactions (Ch.17)	Elementary Particles (Ch.18)	Elementary Particles (Ch.18)
Finals Week Dec 9/11/13		Final Exam (Dec 11) 11:00 am - 1:00 pm	

Dates of Interest Sep 1– last day to drop/add course with 100% tuition credit
 Sep 13– last day to withdraw with 50% tuition credit
 Nov 4– last day to withdraw