Salt Lake Community College
PHYSICS 2710: Introductory Modern Physics – SPRING 2024
[redacted]

Instructor:
Phone:

Office Hours:
Class Website: The official link is on your SLCC MyPage

Prerequisites: PHYS 2220 and at least Concurrent Differential Equations/Linear Algebra (with passing grades)
Text: *Modern Physics,* Randy Harris, Second Edition, Used version is fine.
Quantum Supremacy: How the Quantum Computer Revolution Will Change Everything, Michio Kaku
-- Available new hardcover, and digital

Overview and Grading Policy: Physics 2710 is an introduction to Modern Physics. The course focuses on Relativity, Quantum Mechanics, and Atomic Physics. Course material may be weighted toward the interests of the professor. Students should feel comfortable with Calculus. The grade will come from quizzes, homework assignments, and exams. Secondly, assessment will be done in class through questions you will answer and demonstrations you will work together to explain. The student is responsible for his or her active learning in the course.

1. **Quizzes (15%):** Quizzes will be given at the beginning of many class periods. Quizzes will NOT be returned to the student. You must arrive on time and stay for the entire class period to get credit for the quiz. Quizzes may not be made up.

2. **Assignments (30%):** Assignments are available on Canvas and are required to be done and submitted by the due date given. Assignments submitted after the due date will receive diminishing amounts of credit possible each day that they are late. All late homework is due by the morning of the last regular test. These assignments require time and are not conducive to procrastination. Some assignments may require some computer work.

3. **Physics Aside (15%):** Each student is required to obtain Quantum Supremacy: How the Quantum Computer Revolution Will Change Everything by Michio Kaku (available at amazon.com in print or digital). Each Wednesday, as listed in the calendar, a written summary is due with two parts, 1) a brief summary of the assigned chapters, 2) thoughtful connections and opinions surrounding the material from the assigned chapters and other current class activities, learning, and text. Part of the class time may be spent openly discussing and debating the assigned material. This is a brand new book. We will figure out if it is any good together.

4. **Physics Exploration (10%):** Physics students at four-year universities have the opportunity to attend a weekly seminar series with professionals or researchers presenting their work. For credit, each student is invited to attend one seminar at a local university each month. Generally these events are held at the same time each week and many are now broadcast. Nearby universities that offer these include The University of Utah (HEAP--Thursdays 4pm, Friday early afternoon), Brigham Young University (Wednesdays 4pm?), Utah Valley University (Tuesdays 4pm), and Weber State University (Wednesdays 1:30pm). To receive credit, earnestly attend the event and fill out the assignment form in the course Canvas page. Potential events will be advertised in class. Only official Physics Department colloquia from a four-year university will count.

Grading Scale	
A	> 93%
A-	90 – 92%
B+	87 – 89%
B	83 – 86%
B-	80 – 82%
C+	77 – 79%
C	73 – 76%
C-	70 – 72%
D+	67 – 69%
D	63 – 66%
D-	60 – 62 %
E	< 59%

5. **Exams (30%):** There will be three exams (worth 50 points each) and a final (worth 100 points). You are allowed to use your notes, your textbook, and your calculator. However, you may not use a computer or Internet connection while taking the tests.

Extensions of time for assignments and exams are only available at the discretion of the professor and only if requested PRIOR to the due date. Students unable to attend the scheduled test must notify the professor PRIOR to the time of the test.

Ethics: The student is expected to follow the SLCC Student Code of Conduct found at http://www.slcc.edu/policies/docs/Student_Code_of_Conduct.pdf. Evidence of cheating will constitute grounds for dismissal from the class and an 'E' grade. Turn off cell phones prior to coming to class.

Emergencies: Emergency Evacuation Procedures in case of an emergency. http://www.slcc.edu/emergency-prepare/emergency-procedures.aspx.

SPRING 2023 Physics 2710 Calendar – This schedule is tentative and subject to change.
Students are responsible for all announcements made in class concerning calendar changes, etc.

Date	Material Covered	Homework Due Noon
08-Jan	Receive Syllabus	Q1 Obtain *Quantum*
	NO CLASS due to AAS	*Supremacy (QS),*
		Michio Kaku
10-Jan	**NO CLASS due to AAS**	Q2
15-Jan	**NO CLASS – Martin Luther King Jr. Day**	
17-Jan	Chapter 2: Special Relativity	Q3 Homework 1
		QS Chapters 1-2
22-Jan	Chapter 2: Special Relativity	Q4
24-Jan	Chapter 2: Special Relativity	Q5 Homework 2
		QS Chapters 3-4
29-Jan	Chapter 2: Special Relativity	Q6
31-Jan	Chapter 2: Special Relativity	Q7 Exam 1
		QS Chapter 5
05-Feb	Chapter 3: Waves and Particles I	Q8
07-Feb	Chapter 3: Waves and Particles I	Q9 Homework 3
		QS Chapter 6
12-Feb	Chapter 4: Waves and Particles II	Q10
14-Feb	Chapter 4: Waves and Particles II	Q11 Homework 5
		QS Chapters 7-8
19-Feb	**NO CLASS – Presidents' Day**	
21-Feb	Chapter 4: Waves and Particles II	**Q12 Exam 2**
		QS Chapter 9
26-Feb	Chapter 5: Bound States	Q13
28-Feb	Chapter 5: Bound States	Q14 Homework 6
		QS Chapters 10-11
04-Mar	**NO CLASS – Spring Break**	
06-Mar	**NO CLASS – Spring Break**	
11-Mar	Chapter 5: Bound States	Q15
13 Mar	Chapter 5: Bound States	Q16 Homework 7
		QS Chapter 12
18-Mar	Chapter 6: Unbound States	Q17
20-Mar	Chapter 6: Unbound States	Q18 **Exam 3**
		QS Chapter 13
25-Mar	Chapter 7: Quantum Mechanics in Three Dimensions	Q19
27-Mar	Chapter 7: Quantum Mechanics in Three Dimensions	Q20 Homework 8
		QS Chapter 14
01-Apr	Chapter 7: Quantum Mechanics in Three Dimensions	Q21
03-Apr	Chapter 7: Quantum Mechanics in Three Dimensions	Q22 Homework 9
		QS Chapter 15
8-Apr	Chapter 8: Spin and Atomic Physics	Q23
10-Apr	Chapter 8: Spin and Atomic Physics	Q24 Homework 10
		QS Chapter 16
15-Apr	Chapter 8: Spin and Atomic Physics	Q25
17-Apr	Chapter 9: Statistical Mechanics	Q26 Homework 11
		QS Chapter 17
22-Apr	Chapter 9: Statistical Mechanics	Q27
24-Apr	Chapter 11: Nuclear Physics	**Q28 Final Exam**
	Last Day of Class	QS Epilogue
29-Apr	**No Class**	
01-May	**Final Exam Due by 4 PM**	

This course has the following Student Learning Outcomes with each corresponding College-Wide Student Learning Outcome:

1. Acquire substantive knowledge in their intended major.

2. Communicate effectively.

3. Develop quantitative literacies necessary for their chosen field of study.

4. Think Critically and Creatively.

1. Students will learn to understand and recognize the following physics principles in their everyday lives:
- Relativity
- Quantum mechanics
- Atomic physics
- Bonding in molecules and solids
- Nuclear physics
- Band theory

1. Acquire substantive knowledge in their intended major.

3. Develop quantitative literacies necessary for their chosen field of study.

4. Think Critically and Creatively.

2. Students will learn to think critically and solve physics problems using calculus.

3. Students will gain a solid foundation that will enable them to succeed in their future science courses.

4. Students will learn to think critically and solve physics problems using computers.