Fall 2023, Modern Physics, PHYS 3333.001, CRN 15897

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Professor, Department of Physics, Engineering and Astronomy
Office Hours: MW 9:10-10:40 & 1:30-2:30, or by appointment
(936) 468-2015, Musserja@sfasu.edu, 207P Ed & Gwen Cole STEM Building
Class meeting time and place: STEM 208 MWF 11-12

Course Description (Lecture): An introduction to relativity, quantum phenomena, atomic and nuclear physics. Prerequisites: PHYS1302 or PHYS2326 and MATH 2314 (minimum grade of C); Corequisite: PHYS 3133

Text and Materials: Modern Physics, 3rd Ed., Serway, Moses & Moyer, Cengage (any edition is fine, if you use a different edition, double check the homework problems, ISBN – 9780534493394;

Grading Policy:
Exam 1, Sept. 25th 20 % 90-100 % A
Exam 2, Oct. 16th 20 % 80-89 % B
Exam 3, Nov. 13th 20 % 70-79 % C
Final Exam, Dec. 13th 20 % 60-69 % D
Homework 20 % < 60 % F

Attendance Policy:
If you are going to miss class for a university excused absence you should notify the instructor in advance in writing. It is your responsibility to make arrangements to complete any missed work. If you are sick it is your responsibility to abide by university guidelines in dealing with your absence. The final grade of any student with four or more unexcused absences will be dropped one letter grade. It is the responsibility of the student to provide documentation of any excused absence to the professor within one week of the absence. Failure to provide the documentation within one week of the absence will result in the absence being considered unexcused.

Student Learning Outcomes: By the end of the course, successful students will be able to:
Demonstrate on examination and through homework assignments, proficiency in solving problems in Special Relativity, the Quantum Theory of Light, the Particle nature of matter, the wave nature of matter, tunneling phenomena, three dimensional quantum theory solutions of hydrogen and hydrogen-like atoms, atomic structure and statistical physics

Course Requirements:
♦ Students are required to study chapters 1-10 from the course text. Typical students require 1-2 hours to read each chapter. Students should study 1-2 hours per week.
♦ Homework assignments are generally due one week after the assignment is given. Actual due dates will be provided with the assignment. Homework typically takes 1-4 hours per week.
♦ There will be four major tests including the final.

General Education Core Curriculum: This course is not part of the core curriculum.
# Course Calendar

**PHYS 3333.001**

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- **Aug 28**: Ch 1
- **Aug 29**: Ch 1
- **Aug 30**: Ch 1
- **Aug 31**: Ch 1
- **Aug 1**: Ch 1

- **Aug 4**: Ch 1
- **Aug 5**: Ch 1
- **Aug 6**: Ch 1 & 2
- **Aug 7**: Ch 2
- **Aug 8**: Ch 2

- **Aug 11**: Ch 2
- **Aug 12**: Ch 2
- **Aug 13**: Ch 2
- **Aug 14**: Ch 3
- **Aug 15**: Ch 3

- **Aug 18**: Ch 3
- **Aug 19**: Ch 3
- **Aug 20**: Ch 3
- **Aug 21**: Ch 4
- **Aug 22**: Ch 4

- **Aug 25**: Ch 4
- **Aug 26**: Ch 4
- **Aug 27**: Ch 4
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- **Sep 1**: Ch 4

- **Sep 4**: Ch 4
- **Sep 5**: Ch 5
- **Sep 6**: Ch 5
- **Sep 7**: Ch 5
- **Sep 8**: Ch 5

- **Sep 9**: Ch 5
- **Sep 10**: Ch 5
- **Sep 11**: Ch 5
- **Sep 12**: Ch 6
- **Sep 13**: Ch 6

- **Sep 16**: Ch 6
- **Sep 17**: Ch 6
- **Sep 18**: Ch 6
- **Sep 19**: Ch 6
- **Sep 20**: Ch 6

- **Sep 23**: Ch 6
- **Sep 24**: Ch 6
- **Sep 25**: Ch 6
- **Sep 26**: Ch 6
- **Sep 27**: Ch 6

- **Sep 28**: Ch 6
- **Sep 29**: Ch 6
- **Sep 30**: Ch 6
- **Oct 1**: Ch 6

- **Oct 2**: Ch 6
- **Oct 3**: Ch 7
- **Oct 4**: Ch 7
- **Oct 5**: Ch 7
- **Oct 6**: Ch 7

- **Oct 9**: Ch 7
- **Oct 10**: Ch 7
- **Oct 11**: Ch 7
- **Oct 12**: Ch 7
- **Oct 13**: Ch 7

- **Oct 16**: Ch 7
- **Oct 17**: Ch 7
- **Oct 18**: Ch 7
- **Oct 19**: Ch 7
- **Oct 20**: Ch 7

- **Oct 23**: Ch 7
- **Oct 24**: Ch 7
- **Oct 25**: Ch 7
- **Oct 26**: Ch 7
- **Oct 27**: Ch 7

- **Oct 30**: Ch 7
- **Oct 31**: Ch 7
- **Nov 1**: Ch 7

- **Nov 6**: Ch 7
- **Nov 7**: Ch 8
- **Nov 8**: Ch 8
- **Nov 9**: Ch 8
- **Nov 10**: Ch 8

- **Nov 13**: Ch 8
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- **Nov 15**: Ch 8
- **Nov 16**: Ch 9
- **Nov 17**: Ch 9

- **Nov 20**: Ch 9
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- **Nov 22**: Ch 9
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- **Nov 27**: Ch 9
- **Nov 28**: Ch 9
- **Nov 29**: Ch 9
- **Nov 30**: Ch 9
- **Dec 1**: Ch 9

- **Dec 4**: Ch 10
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- **Dec 20**: Ch 10
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- **Dec 23**: Ch 10
- **Dec 24**: Ch 10

- **Dec 27**: Ch 10
- **Dec 28**: Ch 10
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- **Dec 31**: Ch 10

- **Thanksgiving**: Ch 10

- **Dec 11**: Ch 10
- **Dec 12**: Ch 10
- **Dec 13**: Ch 10
- **Dec 14**: Ch 10
- **Dec 15**: Ch 10

- **Dec 20**: Ch 10
- **Dec 21**: Ch 10
- **Dec 22**: Ch 10
- **Dec 23**: Ch 10
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- **Dec 27**: Ch 10
- **Dec 28**: Ch 10
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- **Dec 30**: Ch 10
- **Dec 31**: Ch 10

- **Finals**: Ch 10

- **Comprehensive Final Exam**
Program Learning Outcomes: No PLO’s are scheduled for assessment this semester.

1. Knowledge: The student will demonstrate knowledge and comprehension of the basic and applied fields of physics

2. Lab Skills: The student will develop good experimental technique, including proper setup and care of equipment, conducting experiments and analyzing results in order to observe physical phenomena, assess experimental uncertainty, and make meaningful comparisons between experiment and theory.

3. Written Communications: The student will develop effective written communication skills by clear and concise problem solving, well-structured laboratory reports, and accepted formatting of research papers.

4. Oral Communications: The student will develop effective oral communication skills in oral presentations of problem solution, seminars, and oral presentations at scientific meetings.

This course meets educator preparation standards for one or more certification programs; a complete listing of all the educator preparation standards this course meets can be found at: https://sfasu.edu/docs/jacksteach/jacksteach-standards-alignment-chart.xlsx

Academic Integrity

The new student code of conduct can be found here: https://www.sfasu.edu/docs/policies/10.4.pdf

Article IV and VI address academic integrity.

Article IV – Prohibited Academic Conduct Any Student who commits an act of academic dishonesty is subject to discipline. Academic dishonesty includes but is not limited to cheating, plagiarism, collusion, the submission for credit of any work or materials that are attributable in whole or in part to another person without giving sufficient credit, taking an examination for another person, or any act designed to give unfair advantage to a Student or the attempt to commit such acts. a. Cheating is the following or attempt to do the following: i. Copying from the test paper (or other assignment) of another Student, engaging in written, oral, or any other means of communication with another Student during a test, or giving aid to or seeking aid from another person during a test or on another assignment where doing so is prohibited by the Faculty member; ii. Possession and/or use during a test of materials which are not authorized by the person giving the test, such as class notes, calculators, electronic devices, books, or specifically designed “crib notes”; iii. Using, obtaining, or attempting to obtain by any means the whole or any part of a non-administered test, test key, homework solution, or computer program, or using a test that has been administered in prior classes or semesters, but which will be used again either in whole or in part, without permission of the Faculty member; or accessing a test bank without Faculty permission; iv. Substituting for another person, or permitting another person to substitute for one’s self, to take a test; v. Falsifying research data, laboratory reports, and/or other records or academic work offered for credit; vi. Using any sort of unauthorized resources or technology in completion of educational activities. Policy Number: 10.4 Last Revised: Date Code of Student Conduct and Academic Integrity Page 5 of 16 b. Plagiarism is the appropriation of material that is attributable in whole or in part to another source or the use of one’s own previous work in another context without citing that it was used previously, without any indication of the original source, including words, ideas, illustrations, structure, computer code, and other expression or media, and presenting that material as one’s own academic work being offered for credit or in conjunction with a program course or degree requirements. c. Collusion is the unauthorized collaboration with another person in preparing academic assignments offered for credit or collaboration with another person to commit a violation of any provision of the rules on academic
dishonesty, including disclosing and/or distributing the contents of an exam. d. Misrepresenting facts for academic advantage to the University or an agent of the University. This includes providing false grades or résumés; providing false or misleading information in an effort to receive a postponement or an extension on a test, quiz, or other assignment for the purpose of obtaining an academic or financial benefit for oneself or another individual; and providing false or misleading information in an effort to injure another Student academically or financially.

**Withheld Grades Semester Grades Policy (5.5)**
Ordinarily, at the discretion of the instructor of record and with the approval of the academic chair/director, a grade of WH will be assigned only if the student cannot complete the course work because of unavoidable circumstances. Students must complete the work within one calendar year from the end of the semester in which they receive a WH, or the grade automatically becomes an F. If students register for the same course in future terms the WH will automatically become an F and will be counted as a repeated course for the purpose of computing the grade point average.

**Students with Disabilities**
To obtain disability related accommodations, alternate formats and/or auxiliary aids, students with disabilities must contact the Office of Disability Services (ODS), Human Services Building, and Room 325, 468-3004 / 468-1004 (TDD) as early as possible in the semester. Once verified, ODS will notify the course instructor and outline the accommodation and/or auxiliary aids to be provided. Failure to request services in a timely manner may delay your accommodations. For additional information, go to [http://www.sfasu.edu/disabilityservices/](http://www.sfasu.edu/disabilityservices/).

**Mental Health and Wellness**
SFA values students’ mental health and the role it plays in academic and overall student success. SFA provides a variety of resources to support students' mental health and wellness. Many of these resources are free, and all of them are confidential.

On-campus Resources:
SFA Counseling Services www.sfasu.edu/counselingservices Rusk Building, 3rd Floor 936.468.2401
SFA Human Services Counseling Clinic www.sfasu.edu/humanservices/139.asp Human Services, Room 202 936.468.1041

Crisis Resources:
Burke 24-hour crisis line: 1.800.392.8343 Suicide Prevention Lifeline: 1.800.273.TALK (8255)
Crisis Text Line: Text HELLO to 741-741

This course meets educator preparation standards for one or more certification programs; a complete listing of all the educator preparation standards this course meets can be found at: [https://sfasu.edu/docs/jacksteach/jacksteach-standards-alignment-chart.xlsx](https://sfasu.edu/docs/jacksteach/jacksteach-standards-alignment-chart.xlsx)