Course Description
This course incorporates student participation in general and specific topics in physics, primarily focused on advanced physics’ topics and research in the physical sciences. Students will refine their documentation for pending job or graduate applications and learn how to market their professional skills and academic experiences. The course may be repeated for credit on a different research topic with departmental approval.
Prerequisite(s): Senior standing and PHYS 4175

Textbooks:
No textbook is required.

Course Objectives
The purpose of this course is to give the student experience in research and preparation of oral presentations on scientific research. Prerequisite: Junior or Senior major status or permission of department chair.

Course Contact Hours and Study Hours
Each student will present a seminar and develop a research poster. The seminar will present research conducted under the direction of an SFASU faculty member. The seminars should include the following: an introduction to the topic, PowerPoint slides (or a suitable electronic alternative), a description of the physics and or engineering involved, related mathematical equations, a hands-on demonstration or chalkboard derivation, and a summary or conclusion. Students will practice the seminar as well as provide and receive feedback. Students will attend other invited seminars as directed. Students will prepare a professional resume. Students will utilize Career Services to go through a mock interview. Students will take the physics subject Major Field Test (MFT) or an engineering exam EE.

Grading Policy
Student grades are determined by the total points earned for the following activities:

- Seminar (30 points)
- Poster (30 points)
- Major Field Test (20 points)
- Resume (10 points)
- Mock Interview (10 points)

The grading scale is as follows: A = 90 to 100, B = 80 to 89, C = 70 to 79, D = 60 to 69, and F < 60. The seminar grades are based on written comments provided by faculty. A student who is not prepared for their practice talk will receive a 10% reduction in their seminar score. Career Services staff will be consulted in order to determine the student’s mock interview grade.

Attendance
Students will receive one letter grade reduction if they have three unexcused absences. Student will receive an “F” for four or more unexcused absences.
Program Learning Outcomes (PLO)
1. Knowledge of Field: The student will demonstrate proficiency in the basic and applied fields of physics.
2. Problem Solving: The student will develop independent problem-solving skills.
3. Laboratory Skill: 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.
4. 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.
5. Oral Communications: The student will develop effective oral communication skills in oral presentations of problem solution, seminars, and oral presentations at scientific meetings.
6. Professional Development: The student will discover the protocols of the professional physicist by attending meetings or giving papers.
   • Physics 4170 addresses outcomes 3, 5, and 6.

Student Learning Outcomes (SLO)
By the end of the course, successful students will be able to:
   • Demonstrate a mastery of oral presentation of physics or astronomy research during two 20-30 minutes presentations.
   • Learn about the different physics and astronomy research areas available in the Department of Physics and Astronomy at SFA.
   • Distinguish ethical behavior in science.

General Education Core Curriculum Objectives/Outcomes (EEO)
This course is not included in the general education core curriculum. Therefore, please see the learning outcomes above rather than any Exemplary Educational Objectives (EEOs).

Academic Integrity
Academic integrity is a responsibility of all university faculty and students. Faculty members promote academic integrity in multiple ways including instruction on the components of academic honesty, as well as abiding by university policy on penalties for cheating and plagiarism.

Definition of Academic Dishonesty
Academic dishonesty includes both cheating and plagiarism. Cheating includes but is not limited to (1) using or attempting to use unauthorized materials to aid in achieving a better grade on a component of a class; (2) the falsification or invention of any information, including citations, on an assigned exercise; and/or (3) helping or attempting to help another in an act of cheating or plagiarism. Plagiarism is presenting the words or ideas of another person as if they were your own. Examples of plagiarism are (1) submitting an assignment as if it were one's own work when, in fact, it is at least partly the work of another; (2) submitting a work that has been purchased or otherwise obtained from an Internet source or another source; and (3) incorporating the words or ideas of an author into one's paper without giving the author due credit. Please read the complete policy at http://www.sfasu.edu/policies/student-academic-dishonesty-4.1.pdf.

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**

SFASU 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:
SFASU Counseling Services  
www.sfasu.edu/counselingservices  
3rd Floor Rusk Building  
936-468-2401

SFASU 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
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<thead>
<tr>
<th>Date</th>
<th>Assignment Due</th>
<th>Speaker</th>
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<tbody>
<tr>
<td>29-Aug-23</td>
<td>Meet with Instructor</td>
<td>PHYS 4170 Instructor</td>
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<tr>
<td>5-Sep-23</td>
<td>Selecting a Seminar Topic</td>
<td>PHYS 4170 Instructor</td>
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<tr>
<td>12-Sep-23</td>
<td>Resume and Job Interviews</td>
<td>Guest Speaker</td>
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<tr>
<td>19-Sep-23</td>
<td>Schedule a Mock Interview</td>
<td>Guest Speaker</td>
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<tr>
<td>26-Sep-23</td>
<td>Seminar Slide Preparation</td>
<td>Guest Speaker</td>
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<td>3-Oct-23</td>
<td>Part 1 of the Practice Major Field Test</td>
<td>Guest Speaker</td>
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<tr>
<td>10-Oct-23</td>
<td>Update Presentation Slides based on Feedback</td>
<td>Guest Speaker</td>
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<td>17-Oct-23</td>
<td>Complete Mock Interview</td>
<td>Guest Speaker</td>
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<tr>
<td>24-Oct-23</td>
<td>Part 2 of the Practice Major Field Test</td>
<td>Student or Guest Speaker</td>
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<td>31-Oct-23</td>
<td>Practice Presentations</td>
<td>Student or Guest Speaker</td>
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<tr>
<td>7-Nov-23</td>
<td>Draft Research Poster</td>
<td>Student or Guest Speaker</td>
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<td>14-Nov-23</td>
<td>Update Research Poster</td>
<td>Student or Guest Speaker</td>
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<td>21-Nov-23</td>
<td>Thanksgiving Holiday</td>
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<td>28-Nov-23</td>
<td>Part 3 of the Practice Major Field Test</td>
<td>Student or Guest Speaker</td>
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<tr>
<td>5-Dec-23</td>
<td>Finalize Research Poster</td>
<td>Turn in Poster for Printing</td>
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<tr>
<td>12-Dec-23</td>
<td>Retake Parts 1-3 of the Practice Major Field Test</td>
<td>Major Fields Test</td>
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