

2013

395 Physics Research

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Recommended Citation

Fatuzzo, Marco, "395 Physics Research" (2013). *Physics Syllabi Fall 2013*. 16.
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Physics Research

PHYS395 – Fall 2013

Common Syllabus

Course Description and Goal

The Physics Research course is a capstone experience that allows students to seek an answer to a fundamental physics-related question of interest to them in a creative and independent manner. This exploration can be a new endeavor, or the continuation of an ongoing project in which the student has been involved. Students are expected to have the majority of their research completed by the end of the fall semester, thereby allowing them to focus on the presentation of their results during the spring semester course PHYS398 (Physics Thesis).

Common Meetings

All students enrolled in PHYS395 are required to attend four Common Meetings during the fall semester. The meetings will be held in Logan 105 from 3:00 – 4:15 pm on the following Wednesdays:

Sept. 4, Oct. 2, Oct. 30 and Dec. 4

Course Components

Project Summary – students will briefly summarize their research plan during the first Common Meeting. This summary, prepared with guidance from the faculty advisor, should inform the audience as to what fundamental question the student seeks to answer, how an outcome will be produced, and how that outcome will answer the posed research question. Feedback Forms filled in by audience members will be used in the assessment of this component.

Weekly Research – students are expected to dedicate a minimum of three hours every week to their research project, and to meet at least once per week with their faculty advisor to discuss their progress. Students are expected to keep a lab notebook detailing their experience.

Common Meetings – students will briefly present their research progress during the 2nd, 3rd and 4th Common Meetings. The presentation should inform the audience as to the specific tasks performed since the previous meeting, how those tasks fit into the overall research objective, whether the tasks produced the desired results, and if not, why. Feedback Forms filled in by audience members will be used in the assessment of this component.

Failure to satisfy any of the above components will result in a lowering of the course grade.

Grading

This course serves to assess the Department of Physics Student Learning Outcomes. As such, a student's grade is determined in part by how well they:

- 1) Display intellectual curiosity about and intuition into the processes of the physical universe;
- 2) Demonstrate a working knowledge of the basic concepts and theories of physics;
- 3) Display critical thinking skills, especially those skills required for the analysis and synthesis of knowledge pertaining to the physical universe;
- 4) Demonstrate technical proficiency in the principles and techniques of theoretical and experimental physics; i.e. be well prepared for graduate study in physics or other scientific or technical fields;
- 5) Display abilities useful for carrying out independent investigation and originality of thought; i.e. develop creative thinking skills necessary for effectively combining knowledge obtained from differing fields and disciplines;
- 6) Display effective oral and written communication skills especially with regards to communicating scientific theories and models, data, results, outcomes, and proposals.

Faculty advisors will assess Student Learning Outcomes (1) – (5) through their weekly meetings, completeness and quality of lab notebooks, and the quality of the results obtained by the student.

Faculty advisors will assess Student Learning Outcomes (6) through Feedback Forms filled in by all participants of the Common Meetings. These Feedback Forms will be posted prior to the weekly meetings.