

Physics 342: Introduction to Research **Fall Semester 2008 (1 Credit)**

Course Bulletin Description: The course will prepare students for independent undergraduate research. The students will be introduced to the literature search process, common research techniques, safety aspects, faculty research interests, and applications of science in industry. **Prerequisite:** PHYS 200

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Class Homepage: *<http://iparrizar.mnstate.edu/~juan/classes/phys342/>*
or
<http://phys342.cabanela.com/>

Required Textbook: There is no required text you must purchase. There will be several reading assignments available online.

Class Meeting Times: Tuesday and Thursdays, 10:30 am - 11:20 am (through Thursday, October 23) in Hagen Hall 305

See the tentative schedule attached to this syllabus for the dates we will not meet.

Goals:

By the end of this course you should be able to write a short research report in the style of a professional scientific journal. You should be able to conduct a literature search and to distinguish between the types of publications in the physics literature. Finally, you should be able to prepare an outline of a/your senior project, including proposal and budget.

Structure of Class:

This course will consist of a mix of oral presentations, class discussions, and lectures. You will turn in brief written work every week. It is important for you to do the assigned reading before coming to class.

The major assignment of the semester will be to develop a senior project proposal. In doing so, you will learn to search the physics literature and to write in a professional style.

Grade Assessment:

- **Weekly Writing (35%):** Every week you will be asked to turn in some brief (well) written work. These writing assignments will be assessed on the following 5 point scale:
 - **0:** assignment is not turned in or plagiarized
 - **1:** Assignment turned in but poorly written, unclear, inappropriate or substantially incomplete.
 - **2:** Assignment incomplete or complete but of marginal quality
 - **3:** Assignment complete and of acceptable quality
 - **4:** Assignment is complete, writing is clear and concise with few grammatical errors
 - **5:** Assignment is complete, writing is outstanding.
- **Discussion/Participation (15%)** will be based on your activity during the entire course (not just a single class). You are not necessarily expected to say something each class period. Participation can be asking question, answering questions, or making relevant comments.
 - **0:** Frequently miss class and/or never participates
 - **1:** Attends all classes but does not participate.
 - **2-3:** Attends class and occasionally participates.
 - **4-5:** Attends class and regularly participates.
- **Senior Project Proposal (30%) and Proposal Presentation (20%):** The major work in this course will be your development of a senior project proposal. It could be your real senior project proposal or if you don't need to make a senior project proposal this year, treat it as a "test run" for the real thing.

You will be expected to make 15-minute oral presentation of your proposal in class on either Thursday, October 9 or Thursday, October 17.

You will be expected to turn in your "final" version of your senior project proposal by Thursday, October 23, at 4pm.

Your senior project proposal and proposal presentation will be graded with the same rubric being used for actual senior projects. Please see

<http://physics.mnstate.edu/winkler/phys455/phys455.html>

for specifics.

Final grades will be assigned on the scale below; **plusses and minuses will be used.**

A	B	C	D	F
≥90%	80%-90%	65%-80%	50%-65%	<50%

Academic Honesty

From the Student handbook

(http://www.mnstate.edu/sthandbook/academic_info/academicpolicies.htm#academichonesty):

The University expects all students to represent themselves in an honest fashion. In academic work, students are expected to present original ideas and give credit for the ideas of others. The value of a college degree depends on the integrity of the work completed by the student. When an instructor has convincing evidence of cheating or plagiarism, the following actions may be taken: assign a failing grade for the course in which the student cheated or instructors may choose to report the offense, the evidence, and their action to the Dean of their college or the Vice President for Academic Affairs. If the instructor (or any other person) feels the seriousness of the offense warrants additional action, the incident may be reported to the Student Conduct Committee through the Student Support Services Office. The Student Conduct Committee will follow procedures set out in the Student Conduct Code. After its review of the case and a fair, unbiased hearing, the Student Conduct Committee may take disciplinary action if the student is found responsible (see Student Conduct Code for details).

A student who has a course grade reduced by an instructor because of cheating or plagiarism, and who disputes the instructor's finding, may appeal the grade, but only by using the Grade Appeal Policy, which states that the student must prove the grade was arbitrary, prejudicial, or in error.

In this course, all instances of academic dishonesty will be reported to the Dean of the College of Social and Natural Sciences for informational purposes. Any academic dishonesty believed to be intentional will result in a failing grade for the entire course.

Special Accommodations

Students with disabilities who believe they may need an accommodation in this class are encouraged to contact Greg Toutges, Coordinator of Disability Services at 477-5859 (Voice) or 1-800-627-3529 (MRS/TTY), CMU 114 as soon as possible to ensure that accommodations are implemented in a timely fashion.

Tentative Schedule¹

Week #	Week of ...	Topic	Tues	Thurs
1	Aug. 24	What is research? Semester goals. Weekly reading / Expectations in Science Writing / Writing for the General Public		Read "The Fine Art of Baloney Detection" by Carl Sagan (password handed out in class) Also find and read one current popular-level science/physics article and bring a printout to class.
2	Aug. 31	Ethics in Scientific Research	Read p. 1 - 12 (to just before "Authorship Practices") of On Being a Scientist	Read p. 12 (starting with "Authorship Practices") - 20 (to just before "The Scientist in Society") of On Being a Scientist Read one column from the Ask the Ethicist website (See Homework #1, due today).
3	Sept. 7	Peer-Reviewed Journals / Literature Searches	Read Part I of the <i>Writing Scientific Manuscripts</i> article from the JYI Also find and read one current technical article (Select from a topic of interest to you) and bring a printout to class.	Training in Online Searches (Meet in Library)
4	Sept. 14	Faculty Presentations on Research/ Writing for Peer-Reviewed Journals	Read Part II of the <i>Writing Scientific Manuscripts</i> article from the JYI Faculty Presentations on Research Winkler (End of Class)	Faculty Presentations on Research Lindaas Lahti Shastri Craig Cabanela
5	Sept. 21	Writing a Proposal / Budgets / Funding of Research	Review the Senior Project Website and read the items on that website before class.	
6	Sept. 28	Doing Research: Organization, Record Keeping, and Planning / Professional Presentations, Conferences, Colloquia		
7	Oct. 5	Graduate School and Professional Information		No Lecture (Prepare for Presentations)
8	Oct. 12		No Lecture (Fall Breather)	Senior Project Proposal Presentations
9	Oct. 19	No class, work on final project	Senior Project Proposal Presentations	Final Senior Project

¹ Current Schedule will be maintained at <http://iparrizar.mnstate.edu/~juan/classes/phys342/schedule.php>