

Professional Skills for Physicists (PHYS 690)

Mon 0900 PHYS 221

Instructor: Dr. Michael Hayden **TA:** none
Office: PHYS 218 Phone: 5-3199 **Office Hours:** come by anytime, please!

Overview

The purpose of this course is to provide you with some of the practical skills necessary for operation as professional physicists in academia, government labs, and industry. Through handouts, web modules, guest speakers, discussions, homework, presentations, and a written grant proposal, we will explore and develop the skills you will need to be successful teachers and researchers in whichever arena you choose.

Learning outcome

Development of enhanced communications skills as required for professional presentations and publications. This learning outcome will be assessed in the grant writing, CV preparation, and oral presentation assignments, as well as your presentation skills during the ethics case studies.

Summary of course topics

Library research skills – full text journal searching, database searching, thesis searches, Inspec, Interlibrary Loan, Web of Science, Google Scholar

Ethics in science – responsible conduct of research, proper authorship, academic integrity

Thesis proposals – how, what, when

Oral and poster presentations – speaking skills, organizational skills, graphic skills

Writing a journal article – format, content, writing style, reviewer skills

Grant proposals – full submission, from idea to technical plan to budget and references

Job search – CV, cover letters, reference letters, where, how, and when to look, expectations

Homework

There will be homework for most weeks, ranging from finding articles in the library to giving an oral presentation to the class or writing a full grant proposal.

Presentations

Each student will be required to give a 15 minute oral, Powerpoint presentation in a style similar to those you have seen in the Dept seminar series. The topic **must** be related to your thesis research and must be **original** (i.e., your own ideas and results). You must also create a conference style poster based on your talk that is similar to those on the walls outside the research labs.

Grant Proposal (white paper)

Each student must write a research proposal in the form required by the National Science Foundation (NSF). The proposal should include all the parts required for submission to the NSF but the technical section will be limited to 3 pages, single spaced. This proposal should be based on your PhD/MS proposal.

Grading

Oral presentation – 25%

Poster presentation – 10%

Homework – 25%

Participation – 15% (If you miss more than one class, or if you are late consistently or if you are late for any of the presentations, you will need to repeat the course.)

Grant proposal – 25%

The course is Pass/Fail. You must score > 80% to pass.

PHYS 690 (Spring 2019)

All classes will be held in **PHYS 221 on Mondays at 0900**, unless noted otherwise below.

Date	Topic	Homework Due
Jan 28	Introduction and Overview of class	
Feb 54	Learning/Teaching in Physics	1. writing assignment: Critical review of an article 2. reading assignment: Science Teaching Reconsidered http://www.nap.edu/catalog.php?record_id=5287 (read chapters 3-4 carefully, skim chapters 1-2)
Feb 11	Library resources, databases, how to stay current with the literature	
Feb 18	PhD proposals: discussion and example	Article retrieval/review; Literature search
Feb 25	Funding agencies	NSF/AFOSR/ONR/ACS/NASA proposal guides
Mar 4	Research posters: discussion and examples, tour meet outside PHYS 221	PhD proposal outlines
Mar 11	Academic integrity – research conduct, authorship	Case studies
Mar 25	Academic integrity – research conduct, authorship	Case studies
Apr 1	Writing your first journal article – which journal?, format, style, voice	Info for authors; readings
Apr 8	Career choices – academia, govt, industry? Interview skills	CV
Apr 15	Class presentations	
Apr 22	Class presentations	White paper
Apr 29	Class presentations	Grant proposal budget
May 6	Class presentations	
May 13	Class presentations	Grant proposal