Introduction to Research and Scientific Communication

PHYS 501 Tuesdays @ 2-4pm, Workman 352 Fall 2013

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Overview

As implied in the title, Introduction to Research and Scientific Communication, there are two parts to this course:

1. **Introduction to Research** (formally known as Grad Lab)
   
   This part of the course is designed to provide research experience during the first year of graduate school. This may include an extensive literature review, building an instrument, data analysis, computer programming, or something else altogether. The nature of the project will be determined between you and a faculty member whose research interests you, and you will work with this faculty member throughout the year to complete the research project.

   The first step is to identify a faculty member to complete this part of the course with. You should do this within the first week, and no later than the second week of courses.

2. **Introduction to Scientific Communication**
   
   This part of the course is designed to provide students with an introduction to the communication skills that are required in graduate school and beyond. This not only includes knowledge and strategies for different types of communication, but strategies for collaboration and working with peers as well. The topics for assignments will be related to the research project above, and we will do a lot of hands-on work during class.

   To some extent, this course will be tied to PHYS 579 (Graduate-Faculty Seminar), and effort within the department to develop critical reading skills. I’d also like to plan for some informal meetings for peer-writing groups, or practice presentations for upcoming conferences (for faculty or students, not restricted to those enrolled in this course).

Learning Outcomes:

Upon completion of PHYS 501 and 502, students will

- Acquire experience with different types of written scientific communication needed for graduate school and beyond
- Develop and practice good strategies for oral presentations
- Develop strategies for working collaboratively and providing/using peer review
- Demonstrate effective use of graphics for communicating technical information
- Develop effective organization strategies for oral and written communication
- Execute proper referencing and avoid plagiarism
Required Texts


Recommended Texts


  This book available electronically through NMT’s Skeen Library.

Course Projects

Conference Abstract

Conference abstracts are submissions to conferences which propose a topic for presentation (either oral or for a poster). Different conferences have different criterion regarding length, but in all cases it is important to succinctly state the nature and relevance of your work. Often these are difficult to write because you may wish to present work that is not yet complete, which makes this a perfect assignment for proposing your research for this course.

Literature Review

It is important to understand your research in the context of previous and ongoing work by other groups. Identifying important resources and organizing them into a useful summary will greatly help your ability to communicate in practically any way (abstract, journal article, oral presentation, etc.). This project will also take advantage of the Critical Reading initiatives being executed independent of this class.

Progress Report

While this may not be a formal requirement for your advisors or committee, often students are requested to write a document that explains the context of their work and describes what they have done and what they intend to do to complete their thesis or dissertation. These are useful documents which may later be incorporated as part of their thesis, dissertation, or a journal article.

Collaborative Proposal

Students will work in groups of 2 or 3 to write a short proposal which responds to some actual request for proposal (RFP). This may be for time on a telescope or supercomputer, or for funding for travel, for example. The actual RFP will hopefully compliment your research, and can be decided later.
Oral Presentation

The oral presentation should be conference style, which will be a 12 minute talk and 3 minutes for questions. We will emphasize good oral presentation practices (including visuals, graphics, speaking, and practicing), and the presentation will occur during one of the seminar slots at the end of the semester.

Smaller Projects

We will also have some smaller reading and writing assignments throughout the semester. Additionally, we will do some informal and formal peer reviewing (similar to what happens during the peer review process when you submit an article for publication).

Next Semester

In addition to the projects listed above, PHYS 502 will have several course projects, including:

- Conference Poster
- Journal article
- CV, resume
- Also, if there is anything that you’d like to see that isn’t covered, we can include that this or next semester.

Policies

Grading

The grade will be determined as follows:

- 50% from progress on your research project, to be assigned by your research faculty
- 50% Activities in this course

For the Communications part of the course, the breakdown will be as follows:

- 20% Class participation (attendance, class discussions, informal peer review, reading reports, etc.)
- 15% Conference Abstract
- 15% Literature Review
- 10% Progress Report
- 20% Collaborative Proposal
- 20% Oral Presentation
Attendance
This class meets only once a week, and therefore it is essential that you come to every class. If you are ill or have some other emergency, please come talk with me as soon as possible. Occasionally we may reschedule class to accommodate peer writing groups or practice presentations for conferences involving students or faculty who are not enrolled in this course.

Participation
This class is intended to be a hands-on course with active participation in discussion and peer review. One of my goals is to foster collaboration (which not only helps to improve communication, but is much more fun than working solo). Consequently, part of your grade will come from participation in class activities (peer reviews, etc).

Late Submissions
You are expected to complete all assigned work in a timely manner. Late submissions will not be accepted or evaluated.

Technology
You are welcome to bring your laptop, tablet, ipad, or other technology to class. However, during class please do not use these for any non-class-related computer use (e.g., e-mail, texts, Facebook, etc.)

Ethical Conduct
The administration, faculty, and your fellow students at New Mexico Tech expect you to act ethically. This includes not cheating, falsifying information, or plagiarizing. Any of these actions may result in you receiving a failing grade for the class, or sending you before the Disciplinary Board for more severe treatment. Other non-ethical acts may be cause for disciplinary action. See the New Mexico Tech Student Handbook for more information and a more complete description (http://www.nmt.edu/nmt-student-handbook).