Physics 6801 Syllabus

Grant Writing and Navigating the Scientific Landscape, Section 01-A, 3 Credits

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Instructor Information

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General Course Information

Description

This course is designed to serve 3 roles: 1) provide a structured environment for preparation **and actual submission** of a scientific grant proposal, typically in the form of graduate research fellowship application (NSF GRFP, NIH F31, NDSEG, DoE, QUAD fellowship, private company fellowship, International fellow program, etc.). Alternatively, if we cannot identify a fellowship that the student is eligible for, this can also serve as a draft of a thesis proposal. This grant writing will be tuned to the individual student's circumstances. The principles of grant writing transfer. 2) Provide a seminar-based introduction into the structure, funding, and profession of science both in the US and globally. 3) Provide training in scientific communication as a professional scientist communicating to different audiences. We will explore the practicalities and the expectations for how science works and what to expect as a professional scientist being trained in academia. This should prepare the student for the next ~4 years in an academic setting and for both academic and non-academic careers afterwards. While a lot of the assignments and material center around the academic science experience, the idea is to develop skills that are translatable outside academia as well. There will be explicit discussion about many different career paths throughout the class. We will also have extensive discussion about the use of incorporation of generative AI into the scientific process at all stages.

Course Learning Outcomes

This course tries to fill in the blanks in your training to be a scientist – giving guidance into how to do all the other aspects of science that any professional career demands – writing, reading, speaking, and communicating to different audiences. It should also be a forum for understanding the practical structures of how science is funded and administered in

academic and non-academic settings. By the end of the course students should have prepared and, when possible, submitted a scientific grant proposal. So the other major goal is to get you your own funding! This will require outlining your intended research, putting it into context of the rest of the field, organizing and citing relevant literature, and editing it down to length. Students will also prepare several other professional products, a short lightning talk on their proposed research, a CV (distinct from a resume), and an additional assignment that the class decides on based on interest. Students should develop an understanding of what the expectations are for different career stages and career paths with knowledge of resources and strategies to pursue them.

Required Course Materials

None required. Some required papers and readings will be provided. The course will be organized through the Georgia Tech online Canvas platform.

Grading Policy:

Course structure: Two, 1.25 hour lecture/discussion/workshops per week. The course will be a mix of 1) professor-led **seminars** on professional preparation topics (structure of US funding institution, journals and peer review, etc.), 2) class **discussions** of current professional science topics (open access, STEM diversity, how university policy is set) and 3) **workshops** (peer editing of grant drafts, a mock NSF-styel review panel, speaking, literature search). Workshops and some discussions will include visiting experts (non-academic professional scientists, other faculty, writing specialists, GT Sci. Comm. staff).

Grading: No tests – this is a seminar and project-based class that is focused on writing grants and building professional skills. Breakdown:

Attendance & Participation:	10%
Proposal Draft:	10%
Personal Statement Draft:	5%
Grant proposal:	25%
Personal Statement:	10%
Lightning Talk:	15%
Class Decision Assignment:	10%
Other Course assignments:	15%

Description of Graded Components

Grading Scale

Your final grade will be assigned as a letter grade according to the following scale:

A 90-100%

B	80-89%
C	70-79%
D	60-69%
F	0-59%

Description of Graded Components

Assignments will provide the steps to develop your grants and other major class projects. These will be self-contained homework involving reading and review prior proposal, scientific papers, and documents from major scientific organizations (e.g. NSF).

Major class projects will be organized around communicating your science first and most significantly in the form a grant or proposal. Students who are not eligible to submit to a specific grant or fellowship opportunity will be able to write a thesis proposal. The grants or proposal will be composed of both a research and personal statement, will be tuned to the specific grant call, and will be iterated with the professor and classroom peers multiple times through the semester. Later class projects will involve in presenting your work in other written and spoken forms (e.g. a lightning talk).

The class will collectively decide with the professor on one additional **class decision course assignment** that involves presentation of research ideas and/or professional development. In the past this has included a peer review of a paper or preparation of a press release.

Course Policies

Attendance and/or Participation

Attendance and Participation will be based on regular class attendance which is critical for discussion and active participation in discussion and workshops. Provided you are here and engage in the course (asking questions, participating in the peer workshopping of drafts, etc.) you will receive full credit. Absences that are excused and planned or due to illness or other emergencies are fine but it is your responsibility to contact me as soon as possible and we will work out any make up that is needed. Missing one or two classes with good reason will likely not require make up work unless you miss a critical workshop or activity. Several or more excused absences will require some make up assignment worked out with me. Unexcused absences (where you don't contact me before or soon after in the case of an emergency) will result in compounding drops to this grade. Tardiness and being unprepared when you need to have something with you for the workshop (e.g. a draft of your proposal) will also result in a reduced participation and attendance grade.

Academic Integrity

Georgia Tech aims to cultivate a community based on trust, academic integrity, and honor. Students are expected to act according to the highest ethical standards. Review Georgia Tech's Honor Code and the student Code of Conduct.

Any student suspected of cheating or plagiarism on a quiz, exam, or assignment will be reported to the Office of Student Integrity, who will investigate the incident and identify the appropriate penalty for violations.

Core IMPACTS

Core IMPACTS is the University System of Georgia's General Education curriculum. If you are teaching a course that counts towards Core IMPACTS, you should include a syllabus statement about the Core area and associated career competencies. This resource developed by the Center for Excellence in Teaching and Learning and Online Education at Georgia State University includes template syllabus statements for each of the Core IMPACTS areas that you may adapt for your course.

Accommodations for Students with Disabilities

If you are a student with learning needs that require special accommodation, contact the Office of Disability Services (404-894-2563) as soon as possible to make an appointment to discuss your special needs and to obtain an accommodations letter. Please also e-mail me as soon as possible in order to set up a time to discuss your learning needs.

Student-Faculty Expectations Agreement

At Georgia Tech, we believe that it is important to strive for an atmosphere of mutual respect, acknowledgement, and responsibility between faculty members and the student body. The Student-Faculty Expectations articulate some basic expectations that you can have of me and that I have of you. In the end, simple respect for knowledge, hard work, and cordial interactions will help build the environment we seek. Therefore, I encourage you to remain committed to the ideals of Georgia Tech while in this class.

Pre- &/or Co-Requisites

2nd year physics graduate standing, equivalent in related graduate program, or permission.

Collaboration, Group Work, and Use of Generative AI

You are expected to adhere to the student Code of Conduct. The most common problem in this type of class is plagiarism, both intentional and unintentional. Any time information or data are incorporated based on a published source, that source must be referenced. Any time words are used verbatim, the source must be referenced and quoted. Copying from

resources or other students, even copying and then changing wording is not allowed. Except for activities that are explicitly instructed to be group efforts, all work must be original work prepared by yourself. However, collaboration on editing and improving ideas is an expected part of the scientific writing process. Use of AI, especially generative AI, will be discussed explicitly in class as part of our professional development topics. Guidelines from grant sources will guide use in proposal writing, but minimally **all** use of AI must be explicitly acknowledged and discussed with the professor and students are expected to take intellectual responsibility for all written and spoken statements.

Extensions, Late Assignments, & Re-Scheduled/Missed Exams

All extensions and late assignments must be arranged with the professor. While reasonable accommodations will be made, external grant submission deadlines mean that it is essential that a plan for anticipated delays or absences be developed as soon as possible around the circumstances.

Student Use of Mobile Devices in the Classroom

Students are encouraged to use mobile devices and laptops in the classroom to facilitate review and discussion of course materials. Some workshops will require use of devices during class. Use of mobile devices for non-course related activities disrupts both your learning and that of those around you. Such activities are not appropriate during class.

Campus Resources for Students

Graduate Student Academic and Professional Success Resources:

A list of resources for graduate students is given on the Office of Graduate and Postdoctoral Education website. Specific information for current graduate students includes

- Academic Resources such as the Communications Center, Language Institute, Library, Catalog, Registrar, resources for conducting research, Advocacy and Conflict Resolution resources, and how to manage unexpected situations that may impact your academic performance;
- Student Resources such as Campus Services, Child Care/Family programs, Health & Wellness, Career Services, and the Student Resource Guide; and
- *Professional Development such as the programming from the Career Center and other professional development resources and events"*

Student Well-Being:

At Georgia Tech, we are concerned about your overall physical, social, and mental well-being. A comprehensive list of wellness related resources has been compiled and maintained by the Office of the Vice President for Student Engagement and Well-being (student-resource-guide (gatech.edu)