

## EPID 7050: Grant Writing and Scientific Communications

### 1. Background and Learning Objectives

This course is a two-part course providing students with 1) guidance and hands-on experience with writing a NIH F-award application and the peer-review process for NIH grants; and 2) writing for publication in scientific journals. The first part of the course will provide an in-depth overview of and experience with the grant writing process. By the beginning of December, students will have drafted and, in writing groups, workshopped the major components of an F30/31/32 application, and had that application reviewed by faculty members in a mock study section. With additional input and editing from the application's sponsor (i.e., the student's mentor and possibly co-mentor), the application should be suitable for submission to the NIH for the December 8 deadline. The second part of the course will expose students to the key elements of scientific communication in epidemiology, with an emphasis on constructing each component of a scientific paper (introduction, methods, results, discussion); adhering to widely-used reporting standards; elements of the peer review process; and selection of appropriate journals for reporting their work.

After completing this course, students will:

- Understand the basic principles of grant writing
- Be familiar with the structure, content, and timeline for preparing an F30/31/32 grant
- Have received guidance on administrative details of grant submission
- Have prepared template documents for mentors to complete
- Have read, written, and workshopped the sections of an F30/31/32 grant
- Had their draft grant application reviewed as part of a mock study section
- Understand the structure of scientific papers
- Be familiar with best practices for writing and preparing each component of a scientific paper, including the introduction, methods, results, and discussion sections, as well as figures and tables
- Have an understanding of and practice with the literature peer review process
- Be able to identify potential predatory publishers and 'gray literature' producers

### 2. General Course Information

**Director:** Sean Hennessy ([hennessy@pennmedicine.upenn.edu](mailto:hennessy@pennmedicine.upenn.edu))

**Teaching Assistant:** Kira Nightingale ([kira.nightingale@pennmedicine.upenn.edu](mailto:kira.nightingale@pennmedicine.upenn.edu))

**Meeting:** Tuesdays and Thursdays 1:45 pm to 3:15 pm in room 235 Blockley Hall

**Credits:** 1.0 course unit

**Prerequisites:**

Students should have identified a research topic and F-award sponsor (mentor) prior to participating in this course. Ideally, the student should have drafted Specific Aims for the grant. Although the student's primary sponsor should have independent R01-level NIH funding, co-sponsorship arrangements can sometimes work if the secondary but not primary mentor is R01-funded. Students outside of the Epidemiology PhD program who are planning to submit an F award application for the December 8 may take this course with permission of the course director, subject to availability. Although international students are encouraged to participate to learn and practice grant writing principles, NIH policy states that only US citizens and permanent residents are eligible for F awards. Non-NIH Funding opportunities for international students are described here: <https://www.fic.nih.gov/Funding/NonNIH?type=predoctoral>.

**Materials:** Required readings are listed in the session-by-session outline below. Additional recommended readings are listed below.

- Schimel, Joshua. *Writing Science: How to Write Papers That Get Cited and Proposals That Get Funded*, Illustrated Edition.  
[https://franklin.library.upenn.edu/catalog/FRANKLIN\\_9977718823403681](https://franklin.library.upenn.edu/catalog/FRANKLIN_9977718823403681)
- Tufte, Edward R. *The Visual Display of Quantitative Information*, 2<sup>nd</sup> edition.  
[https://franklin.library.upenn.edu/catalog/FRANKLIN\\_9932420603503681](https://franklin.library.upenn.edu/catalog/FRANKLIN_9932420603503681)
- Tufte, Edward R. *Visual explanations : images and quantities, evidence and narrative*.  
[https://franklin.library.upenn.edu/catalog/FRANKLIN\\_9920362793503681](https://franklin.library.upenn.edu/catalog/FRANKLIN_9920362793503681)
- Tufte, Edward R. *Envisioning Information*.  
[https://franklin.library.upenn.edu/catalog/FRANKLIN\\_9912908433503681](https://franklin.library.upenn.edu/catalog/FRANKLIN_9912908433503681)
- Saramäki, Jari. *How to Write a Scientific Paper: An Academic Self-Help Guide for PhD Students*. ([Amazon](#))

**Format:** The class will meet weekly on Tuesdays and Thursdays 1:45-3:15 pm ET in 235 Blockley Hall. Until the beginning of December, the course will be devoted to preparation, workshopping, and peer review of an F30/F31/F32 grant application. While there will be some instructor-led content, the majority of class time will be spent in writing groups of ~4 students each, with the course director and teaching assistant circulating among the groups. In the writing groups, students will workshop all of the major components of an F-award application. While the schedule below provides a structure for preparing applications, students should work ahead in the schedule. Further, students may use their individual discussion time to discuss any component of the grant that they would like feedback on, but will need to submit that week's assignment on the shared Box folder on time to have that assignment marked complete. The remaining weeks of class will be devoted to other aspects of scientific communications in epidemiology.

**Grading:** 1) Homework (70%)  
2) Attendance and in-class participation (30%)

### Academic Freedom Statement

The policies of the University of Pennsylvania protect academic freedom, as defined in the [American Association of University Professors' 1940 Statement of Principles](#). This statement has been endorsed by over 250 scholarly and educational organizations in the United States, and its principles are written into faculty handbooks nationwide, including [Penn's](#). The principles of academic freedom were established to protect the integrity of research and teaching from interference by donors, trustees, politicians, and others who might seek to make universities serve private and political interests. They are founded on the idea that a university's purpose is to generate new knowledge that can serve the common good in a democratic society, and that generating new knowledge requires free and open inquiry. To safeguard the university's public mission, academic freedom entails the following rights for all faculty members—whether tenure-track or non-tenure track, and including graduate research and teaching assistants—and for students:

- The right of faculty members to full freedom in research, teaching, extramural speech (public speech on issues of general concern) and intramural speech (speech about the university itself, including criticism of it).
- The right of students to freedom in learning, which includes freedom of association and expression and freedom of inquiry in the classroom.

Academic freedom is only as strong as the institutions, procedures, and professional norms that faculty members established over the last century to protect it: institutions of faculty governance such as Faculty Senates and unions; the institution of tenure; and due process procedures that protect both tenure-track and non-tenure-track faculty against unjust discipline or dismissal. For further information about academic freedom, see the [AAUP-Penn website](#).

#	Date	Instructor-led content	In-class participant activities	Assignment (due before next class unless otherwise specified)
1.	Tues 8/27/24	Orientation to the course. Why apply for grants? Funding agencies. NIH funding mechanisms. NIH grant deadlines. Institute-Center (IC)-specific information, requirements, and staff contacts. Communicating with Agency Contacts. Required components of an F application. Using NIH RePORTER to see if your target institute funds F31s in your area. Who makes a good sponsor / co-sponsor? Role of the applicant and sponsor/co-sponsor in the application process. Logistics of submitting F applications at Penn. The <i>Specific Aims</i> page: Why? And What?	Introductions. In groups, share your responses to Assignment 1.	<p>Pre-reading before the first class: <a href="#">A Practical Guide to Writing a Ruth L. Kirschstein NRSA Grant</a> and BGS page on Predoctoral Fellowships: <a href="https://www.med.upenn.edu/bgs/predoctoral-fellowships.html">https://www.med.upenn.edu/bgs/predoctoral-fellowships.html</a></p> <p>Assignment 1 due for first class (8/27/24): Motivation and preliminaries.</p> <p>Please address the following in writing:</p> <ol style="list-style-type: none"> <li>What is your motivation for applying for an F award?</li> <li>What grant mechanism (F30/F31/F32) and date are you planning to apply for?</li> <li>Who would you like to be the sponsor / co-sponsor of your application?</li> <li>Has the sponsor (and co-sponsor) agreed to serve this role?</li> <li>What is the general topic of your proposal?</li> <li>What are some factors that affect your effectiveness in writing?</li> <li>What time of day do you write best?</li> <li>What duration of time do you try to write for?</li> <li>When do you foresee yourself writing this semester?</li> <li>How do you limit distractions when you write?</li> <li>What do you do with your email app when you write?</li> </ol> <p>Assignment 2 due next class (8/29/24)</p> <ol style="list-style-type: none"> <li>Specific Aims, draft 1. Read the <i>Specific Aims</i> sections of each of the sample grant applications. Draft a <i>Specific Aims</i> page for your project. If possible, get feedback from your sponsor before submitting as homework.</li> <li>Contact the person who you'd like to serve as your sponsor, co-sponsor (if needed), collaborators, and referees to ask if they'd be willing to serve in these roles.</li> <li>Read: FOA for <a href="#">parent F30</a>, <a href="#">parent F31</a>, parent <a href="#">F31-Diversity</a>, <a href="#">parent F32</a>, whichever is relevant for you.</li> <li>Optional: Try Penn's <a href="#">writing accountability group</a></li> </ol>

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2.	Thurs 8/29/24	The process of grant writing. NIH Reviews. The post-review process. Resubmissions.	Group designation based on topic similarity. In groups, workshop each participant's draft <i>Specific Aims</i> page (Assignment 2).  Group 1: Sean; Group 2: Kira	Assignment 3: Specific Aims, draft 2. Revise your <i>Specific Aims</i> page based on feedback received. If possible, get feedback from your sponsor before submitting.  If you are a GGEB student, email Marianne Altland <a href="mailto:altland@penn-medicine.upenn.edu">altland@penn-medicine.upenn.edu</a> in the BGS business office and let her know that you are planning to apply for an F-award for the Dec 8 deadline. Include the working title of the grant, the institute that you're planning to submit to, the name of your sponsor (mentor), and the duration of support that you plan to request.
3.	Tues 9/3/24	The <i>Approach</i> section: How?	In groups, workshop the revised <i>Specific Aims</i> page (Assignment 3).  Group 1: Kira; Group 2: Sean	Assignment 4: Read the <i>Approach</i> section of at least three of the sample grant applications.  <u>Approach, outline.</u> Write an <u>outline</u> for a 4-5 page <i>Approach</i> section. Make the outline as specific to your project as possible (for example, say what the design will actually be). If possible, get feedback from your sponsor before submitting.
4.	Thurs 9/5/24	Office of Research Support Services (ORSS) research administration academy training. (Chanika Pratt)	In groups, workshop the <i>Approach</i> outline (Assignment 4).  Group 1: Sean; Group 2: Kira	Assignment 5: Read pages 58-63 (sections 1 – 4) of <a href="#">Fellowship Instructions for NIH and other PHS Agencies</a> .  (Due 9/12/24) <u>Approach, draft 1.</u> Flesh out the 4-5 page <i>Approach</i> section based on your outline and the feedback provided.
5.	Tues 9/10/24	Working with sponsors, co-sponsors, collaborators, letter writers. (Kira Nightingale)	In groups, discuss working with sponsors, co-sponsors, collaborators, and letter-writers, including timelines for providing drafts and asking for info. Check in about contact with sponsor, co-sponsor, collaborators, letter writers (Assignment 2).  Group 1: Kira; Group 2: Sean	Read the <i>Significance</i> section of at least three of the sample grant applications.  Continue working on Assignment 5.
6.	Thurs 9/12/24	None.	In groups, workshop the <i>Approach</i> draft (Assignment 5).  Group 1: Sean; Group 2: Kira	Assignment 6: Approach, draft 2. Revise the draft of the <i>Approach</i> section based on the feedback provided. If possible, get feedback from your sponsor before submission.  Discussion about submission deadline for assignments. Complete anonymous survey regarding submission deadline.

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7.	Tues 9/17/24	The <i>Significance</i> section: Why?	In groups, workshop the revised <i>Approach</i> page (Assignment 6).  Group 1: Kira; Group 2: Sean	<u>Assignment 7:</u> (Due 9/24/24) <i>Significance, outline</i> . Write an <u>outline</u> for a 1-2 page <i>Significance</i> section. If possible, get feedback from your sponsor before submission.
8.	Thurs 9/19/24	NIH Fellowship Changes Webinar	None.	Read the <i>Respective Contributions, Selection of Sponsor and Institution, and Letters of Support</i> from at least three sample grants.  Continue working on Assignment 7.
9.	Tues 9/24/24	None.	Share what is working and not working about your writing process. What affects your ability to write? Where, when, and how long do you write? How are you handling email and other distractions while you write?  In groups, workshop Assignment 7.  Group 1: Sean; Group 2: Kira	Assignment 8: (Due 10/01/24) <i>Significance</i> , draft 1. Flesh out the 1-2 page <i>Significance</i> section based on your outline and the feedback provided. If possible, get feedback from your sponsor before submission.
10	Thurs 9/26/24	None.	Use in-class time to work on Assignment 9 in the presence of your small group. This is to provide experience writing in the presence of others. Be there for your classmates.  Group 1: Kira; Group 2: Sean	Continue working on Assignment 8.  Read the <i>Sponsor (and Co-Sponsor) Statement, and Training Plan</i> from at least three sample grants.  <u>Read</u> pages 66-69 (sections 9 - 12) of <a href="#">Fellowship Instructions for NIH and other PHS Agencies</a> .
11	Tues 10/1/24	The <i>Respective Contributions</i> section, the <i>Selection of Sponsor and Institution</i> section, <i>Sponsor and Co-Sponsor statements</i> , bio-sketches.	In groups, workshop Assignment 8.  Group 1: Sean; Group 2: Kira	Assignment 9: <i>Significance</i> , draft 2. Revise the draft of the 1-2 page <i>Significance</i> section based on the feedback provided. If possible, get feedback from your sponsor before submission.
12	Thurs 10/3/24	The Training Plan (Kira Nightingale)	In groups, workshop Assignment 9.  Group 1: Kira; Group 2: Sean	Assignment 10: <i>Training Plan</i> , draft 1. Write a 2-3 page <i>Training Plan</i> from the perspective of your Sponsor(s). If possible, get feedback from your sponsor before submission.  Read the <i>Fellowship Applicant</i> section (includes <i>Applicant's Background, Training Goals and Objectives</i> and <i>Activities Planned Under this Award</i> ) from at least three sample grants.

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13	Tues 10/8/24	None.	In groups, workshop the <i>Training Plan</i> draft (Assignment 10).  Group 1: Sean; Group 2: Kira	Assignment 11: <i>Training Plan</i> , draft 2. Revise your 2-3 page <i>Training Plan</i> based on feedback. If possible, get feedback from your sponsor before submission.
14	Thurs 10/10/24	The <i>Fellowship Applicant</i> section (Kira Nightingale)	In groups, workshop Assignment 11.  Group 1: Kira; Group 2: Sean	Assignment 12: Draft the <i>Doctoral Dissertation and Research Experience</i> component (~3 pages) of the <i>Applicant's Background and Goals for Fellowship Training</i> (6 pages total, includes <i>Doctoral Dissertation and Research Experience</i> , <i>Training Goals and Objectives</i> , and <i>Activities Planned Under This Award</i> ). If possible, get feedback from your sponsor before submission.
15	Tues 10/15/24	Human Subjects Documents (Kira Nightingale)	In groups, workshop Assignment 12.  Group 1: Sean; Group 2: Kira	Assignment 13: <u>Revise</u> the <i>Doctoral Dissertation and Research Experience</i> component (~3 pages) of the Applicant's Background and Goals for Fellowship Training <u>Draft</u> the <i>Training Goals and Objectives</i> and <i>Activities Planned Under This Award</i> component (~3 pages) of the <i>Applicant's Background and Goals for Fellowship Training</i> (6 pages total, includes <i>Doctoral Dissertation and Research Experience</i> , <i>Training Goals and Objectives</i> , and <i>Activities Planned Under This Award</i> ). If possible, get feedback from your sponsor before submission.
16	Thurs 10/17/24	None.	In groups, workshop Assignment 13.  Group 1: Kira; Group 2: Sean	Assignment 14: <u>Revise</u> the <i>Training Goals and Objectives</i> and <i>Activities Planned Under This Award</i> component (~3 pages) of the <i>Applicant's Background and Goals for Fellowship Training</i> (6 pages total, includes <i>Doctoral Dissertation and Research Experience</i> , <i>Training Goals and Objectives</i> , and <i>Activities Planned Under This Award</i> ). <u>Draft</u> the <i>Sponsor (and Co-Sponsor) Statements</i> (6 pages), and <i>Letters of Support from Collaborators, Contributors, and Consultants</i> (6 pages). If possible, get feedback from your sponsor before submission.
17	Tues 10/22/24	None.	In groups, workshop Assignment 14.  Group 1: Sean; Group 2: Kira	Assignment 15: Revise the <i>Sponsor (and Co-Sponsor) Statements</i> (6 pages), and <i>Letters of Support from Collaborators, Contributors, and Consultants</i> (6 pages). If possible, get feedback from your sponsor before submission.

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18	Thurs 10/24/24	None.	In groups, workshop Assignment 15.  Group 1: Kira; Group 2: Sean	Assignment 16: Draft the <i>Respective Contributions</i> (1 page), <i>Selection of Sponsor and Institution</i> (1 page), <i>Training in the Responsible Conduct of Research</i> (1 page), and <i>Description of Institutional Environment and Commitment to Training</i> (2 pages) sections. If possible, get feedback from your sponsor before submission.
19	Tues 10/29/24	None.	In groups, workshop Assignment 16.  Group 1: Sean; Group 2: Kira	Assignment 17: Draft the <i>Project Summary / Abstract</i> (30 lines), <i>Project Narrative</i> (3 sentences), and <i>Biosketch</i> (5 pages). If possible, get feedback from your sponsor before submission.
20	Thurs 10/31/24	None.	In groups, workshop Assignment 17.  Group 1: Kira; Group 2: Sean	Assignment 18. By Tues Nov 5th at 11:59 pm, submit 1 PDF with the following sections (in this order): <i>Project Summary / Abstract</i> (30 lines), <i>Project Narrative</i> (3 sentences), <i>Bibliography &amp; References Cited</i> (no limit), <i>Facilities and Other Resources</i> (no limit), <i>Equipment</i> (1 page, if applicable), <i>Candidate's Biosketch</i> (5 pages), <i>Sponsor/Co-Sponsor Biosketches</i> , <i>Other Key Personnel Biosketches</i> (5 pages each), <i>Applicant's Background and Goals for Fellowship Training</i> (6 pages), <i>Specific Aims</i> (1 page), <i>Research Strategy</i> (6 pages), <i>Respective Contributions</i> (1 page), <i>Selection of Sponsor and Institution</i> (1 page), <i>Training in the Responsible Conduct of Research</i> (1 page), <i>Sponsor and Co-Sponsor Statements</i> (6 pages), <i>Letters of Support from Collaborators, Contributors, and Consultants</i> (6 pages), <i>Description of Institutional Environment and Commitment to Training</i> (2 pages). This is to be reviewed at the mock study section sessions.
21	Tues 11/5/24	None.	Use in-class time to work on your application. Kira and Sean available for individual consultations.	None. Assignment 18 due by 11:59 pm.
22	Thurs 11/7/24	Cover letter and Resource Sharing Plan (Kira Nightingale)	Use in-class time to work on your application. Kira and Sean available for individual consultations.	None.
23	Tues 11/12/24	None.	Mock study section session 1 (20 min per application). Participants:, (faculty:), ( )	None.
24	Thurs 11/14/24	None.	Mock study section session 2 (20 min per application). Participants: (faculty), (faculty:)	None.
25	Tues 11/19/24	None.	Use in-class time to work on your application. Kira and Sean available for individual consultations.	None.

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26	Thurs 11/21/24	None.	Use in-class time to work on your application. Kira and Sean available for individual consultations.	None.
27	Tues 11/26/24	None.	Use in-class time to work on your application. Kira and Sean available for individual consultations.	None.
28	Thurs 11/28/24	Thanksgiving Holiday – No Class		
	Mon 12/02/24	Submit all required F30/31 materials to Marianne Altland altland@pennmedicine.upenn.edu in the BGS business office.		
29	Tues 12/3/24	Michael Harhay: Guidelines for statistical reporting in papers		Read: Harhay MO, Donaldson GC. Guidance on statistical reporting to help improve your chances of a favorable statistical review. American Journal of Respiratory and Critical Care Medicine. 2020 May 1;201(9):1035-8. <a href="https://www.atsjournals.org/doi/10.1164/rccm.202003-0477ED">https://www.atsjournals.org/doi/10.1164/rccm.202003-0477ED</a>
30	Thurs 12/5/24	Ellie Caniglia: Reporting the results of emulated trials and propensity score methods	Lunch provided	Read: Lederer DJ, Bell SC, Branson RD, Chalmers JD, Marshall R, Maslove DM, Ost DE, Punjabi NM, Schatz M, Smyth AR, Stewart PW. Control of confounding and reporting of results in causal inference studies. Guidance for authors from editors of respiratory, sleep, and critical care journals. Annals of the American Thoracic Society. 2019 Jan;16(1):22-8. <a href="https://www.atsjournals.org/doi/full/10.1513/AnnalsATS.201808-564PS[SNR1]">https://www.atsjournals.org/doi/full/10.1513/AnnalsATS.201808-564PS[SNR1]</a>  von Elm E, Altman DG, Egger M, Pocock SJ, Gotsche PC, Vandenbroucke JP for the STROBE Initiative. The Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) Statement. BMJ 2007;335:806. <a href="https://www.bmj.com/content/335/7624/806">https://www.bmj.com/content/335/7624/806</a>