**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 grant 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 a 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 mentor/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:*** Tuhina Srivastava ([tuhinas@pennmedicine.upenn.edu](mailto:tuhinas@pennmedicine.upenn.edu))

***Meeting:*** Mondays and Weds 1:45 pm to 3:15 pm, 235 Blockley Hall

***Credits:*** 1.0 course unit

***Prerequisites:*** This course is intended for students who have completed their first year of the Epidemiology PhD program. Students should have identified a doctoral dissertation topic and F-award sponsor (mentor) prior to participating in this course. Students outside of the Epidemiology PhD program and students still developing dissertation topics 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.

***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>
* Tufte, Edward R. *The Visual Display of Quantitative Information, 2nd edition.* <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>
* Tufte, Edward R. *Envisioning Information.* <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](https://www.amazon.com/How-Write-Scientific-Paper-Self-Help/dp/173078416X/))

***Format:*** The class will meet weekly on Mondays and Weds 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. Students will have a full draft of their application reviewed by faculty members other than the course director and discussed in the format of a mock study section. 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%)

| **#** | **Date** | **Instructor-led content** | **In-class participant activities** | **Assignment (due next class unless otherwise specified)** |
| --- | --- | --- | --- | --- |
|  | Wed August 30, 2023 | 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 F31 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 F31s at Penn. The *Specific Aims* page: Why? And What? | Introductions. | Pre-reading before the first class: [A Practical Guide to Writing a Ruth L. Kirschstein NRSA Grant](file:///C:\Users\hennessy\Box\Grant%20writing%20&%20Scientific%20Writing%20Course\A%20Practical%20Guide%20to%20Writing%20a%20Ruth%20L.%20Kirschstein%20NRSA%20Grant) and BGS page on Predoctoral Fellowships: <https://www.med.upenn.edu/bgs/predoctoral-fellowships.html>  Assignment 1: Motivation and preliminaries. By next class, please address the following in writing: a. What is your motivation for applying for a grant? b. What grant mechanism and date are you planning to apply for? c. Who will be the sponsor / co-sponsor of your application? d. Has the sponsor (and co-sponsor) agreed to serve this role? e. What is the general topic of your proposal? d. What are some factors that affect your effectiveness in writing? e. What time of day do you write best? f. What duration of time do you try to write for? g. When do you foresee yourself writing this semester? h. How do you limit distractions when you write? i. What do you do with your email when you write? Also, 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. Read: FOA for parent F30 (<https://grants.nih.gov/grants/guide/pa-files/PA-23-260.html>) parent F31 (<https://grants.nih.gov/grants/guide/pa-files/PA-23-272.html>) or parent F32 (<https://grants.nih.gov/grants/guide/pa-files/PA-21-048.html>), whichever is relevant for you. |
|  | Wed Sep 6, 2023 | Identifying referees (i.e., reference letter writers) and requesting letters. The process of grant writing. | In groups, share your responses to Assignment 1. | Assignment 2: Specific Aims, draft 1. Read the *Specific Aims* sections of each of the sample grant applications. Draft a *Specific Aims* page for your project. If possible, get feedback from your sponsor before submitting as homework. Email Marianne Altland [altland@pennmedicine.upenn.edu](mailto:altland@pennmedicine.upenn.edu) 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. (Haedi, since you’re submitting a F32, you should submit this to Shawn Fenty [shawnr@pennmedicine.upenn.edu](mailto:shawnr@pennmedicine.upenn.edu) in the DBEI business office.) |
|  | Mon Sep 11, 2023 | None. | In groups, workshop each participant’s draft *Specific Aims* page (Assignment 2). | Assignment 3: Specific Aims, draft 2. Revise and hand-in your *Specific Aims* page based on feedback received. If possible, get feedback from your sponsor before submitting. Read the *Significance* section of at least three of the sample grant applications. |
|  | Wed Sep 13, 2023 | The *Significance* section: Why? | In groups, workshop each participant’s revised *Specific Aims* page (Assignment 3). | Assignment 4: Read pages 59-61 of FELLOWSHIP INSTRUCTIONS FOR NIH AND OTHER PHS AGENCIES (<https://grants.nih.gov/grants/how-to-apply-application-guide/forms-h/fellowship-forms-h.pdf>). Write an outline for a 1-2 page *Significance* section. If possible, get feedback from your sponsor before submitting. Read the *Respective Contributions*, *Selection of Sponsor and Institution*, *Sponsor (and Co-Sponsor) Statement,* and *Training Plan* from at least three sample grants. |
|  | Mon Sep 18, 2023 | No class. Students are encouraged to attend the [Third Penn Conference on Big Data in Bid Data in Biomedical and Population Health Sciences](https://www.dbei.med.upenn.edu/big-data-3) | | |
|  | Wed Sep 20, 2023 | Working with sponsors, co-sponsors, collaborators, letter writers.  Tuhina Srivastava | 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 1). Workshop each participant’s outline of the *Significance* section (Assignment 4). | Assignment 5: *Significance*, draft 1. Flesh out the 1-2 page *Significance* section based on your outline and the feedback provided (due the class after next). Read the *Approach* section of at least three sample grant applications. |
|  | Mon Sep 25, 2023 | The *Approach* section: How? | 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? Share feedback on progress on recruiting a sponsor, co-sponsor (if needed), collaborators, and referees (letter writers) (Assignment 1) | Continue working on Assignment 5 (draft *Significance* section). |
|  | Wed Sep 27, 2023 | None.  **Sean out of town** | In groups, workshop each participant’s draft *Significance* section (Assignment 5). | Assignment 6: *Significance*, draft 2. Revise the draft of the 1-2 page *Significance* section based on the feedback provided. If possible, get feedback from your sponsor before submitting (due class after next). |
|  | Mon Oct 2, 2023 | The *Respective Contributions* section, the *Selection of Sponsor and Institution* section, *Sponsor and Co-Sponsor statements*, biosketches. | Use in-class time to work on Assignment 6 (*Significance,* draft 2) in the presence of your small group. This is to provide experience writing in the presence of others. Be there for your classmates. | Continue working on Assignment 6. |
|  | Wed Oct 4, 2023 | None. | In groups, workshop each participant’s revised *Significance* section (Assignment 6). | Assignment 7: Draft an outline of your 4-5 page *Approach* section (*Significance* + *Approach* = 6 pages). 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 as homework. |
|  | Mon Oct 9, 2023 | None.  **Sean out of town** | In groups, workshop each participant’s outline of the *Approach* section (Assignment 7). | Assignment 8: Flesh out the 4-5 page *Approach* section (*Significance* + *Approach* = 6 pages), due the class after next. If possible, get feedback from your sponsor before submitting as homework. |
|  | Wed Oct 11, 2023 | The *Fellowship Applicant* section (Tuhina Srivastava) | Use in-class time to work on *Approach*, draft 1 (Assignment 8) in the presence of your small group. This is to provide experience writing in the presence of others. Be there for your classmates. | Continue working on Assignment 8. Read pages 56-58 of FELLOWSHIP INSTRUCTIONS FOR NIH AND OTHER PHS AGENCIES (<https://grants.nih.gov/grants/how-to-apply-application-guide/forms-h/fellowship-forms-h.pdf>). Read the *Fellowship Applicant* section (includes *Applicant’s Background,* *Training Goals and Objectives* and *Activities Planned Under this Award*) from at least 3 of the sample grant applications. |
|  | Mon Oct 16, 2023 | None. | In groups, workshop each participant’s revised *Approach* section (Assignment 8). | Assignment 9. Draft the *Doctoral Dissertation and Research Experience* component (~3 pages) of the *Applicant’s Background and Goals for Fellowship Training* (6 pages total, includes *Doctoral Dissertation and Research Experience*, *Training Goals and Objectives*, and *Activities Planned Under This Award*). If possible, get feedback from your sponsor before submitting as homework. |
|  | Wed Oct 18, 2023 | None. | In groups, workshop each participant’s draft *Doctoral Dissertation and Research Experience* component (Assignment 9). | Assignment 10. Revise the *Doctoral Dissertation and Research Experience* component (~3 pages) of the *Applicant’s Background and Goals for Fellowship Training* (6 pages total, includes *Doctoral Dissertation and Research Experience*, *Training Goals and Objectives*, and *Activities Planned Under This Award*). If possible, get feedback from your sponsor before submitting as homework. |
|  | Mon Oct 23, 2023 | None. | In groups, workshop each participant’s revised *Applicant’s Background and Goals for Fellowship Training* section (Assignment 10). | Assignment 11. Draft the *Training Goals and Objectives* and *Activities Planned Under This Award* component (~3 pages) of the *Applicant’s Background and Goals for Fellowship Training* (6 pages total, includes *Doctoral Dissertation and Research Experience*, *Training Goals and Objectives*, and *Activities Planned Under This Award*). If possible, get feedback from your sponsor before submitting as homework. |
|  | Wed Oct 25, 2023 | None. | In groups, workshop each participant’s draft *Training Goals and Objectives* and *Activities Planned Under This Award* component (Assignment 11). | Assignment 12. Revise the *Training Goals and Objectives* and *Activities Planned Under This Award* component (~3 pages) of the *Applicant’s Background and Goals for Fellowship Training* (6 pages total, includes *Doctoral Dissertation and Research Experience*, *Training Goals and Objectives*, and *Activities Planned Under This Award*). If possible, get feedback from your sponsor before submitting as homework. |
|  | Mon Oct 30, 2023 | None. | In groups, workshop each participant’s revised *Training Goals and Objectives* and *Activities Planned Under This Award* component (Assignment 12). | Assignment 13. Read pages 61-67 of FELLOWSHIP INSTRUCTIONS FOR NIH AND OTHER PHS AGENCIES (<https://grants.nih.gov/grants/how-to-apply-application-guide/forms-h/fellowship-forms-h.pdf>). Draft your, *Respective Contributions (*1 page*)*, *Selection of Sponsor and Institution* (1 page), and *Training in the Responsible Conduct of Research* (1 page) sections. If possible, get feedback from your sponsor before submitting as homework. |
|  | Wed Nov 1, 2023 | None. | In groups, workshop each participant’s draft *Biosketch*, *Respective Contributions,* *Selection of Sponsor and Institution*, and *Training in the Responsible Conduct of Research* sections (Assignment 13). | Assignment 14. Draft the *Sponsor (and Co-Sponsor) Statements* (6 pages), *Letters of Support from Collaborators, Contributors, and Consultants* (6 pages), and *Description of Institutional Environment and Commitment to Training* (2 pages) sections. If possible, get feedback from your sponsor before submitting as homework. |
|  | Mon Nov 6, 2023 | None. | In groups, workshop each participant’s *Sponsor (and Co-Sponsor) Statements*, *Letters of Support from Collaborators, Contributors, and Consultants*, *Description of Institutional Environment and Commitment to Training* (Assignment 14). | Assignment 15. Draft the *Project Summary / Abstract* (30 lines), *Project Narrative* (3 sentences), and *Biosketch (*5 pages). If possible, get feedback from your sponsor before submitting as homework. |
|  | Wed Nov 8, 2023 | None. | In groups, workshop each participant’s *Project Summary / Abstract*, *Project Narrative*, and *Biosketch*. | Assignment 16. By midnight Wed Nov 8, submit 1 PDF with the following sections (in this order): *Project Summary / Abstract* (30 lines), *Project Narrative* (3 sentences)*, Bibliography & References Cited* (no limit)*, Facilities and Other Resources* (no limit)*, Equipment* (1 page)*, Candidate’s Biosketch* (5 pages)*, Sponsor/Co-Sponsor Biostketches, Other Key Personnel Biosketches* (5 pages each)*, Applicant’s Background and Goals for Fellowship Training* (6 pages)*,* Assignment 17. *Specific Aims* (1 page)*, Research Strategy* (6 pages)*, Respective Contributions* (1 page)*, Selection of Sponsor and Institution* (1 page)*, Training in the Responsible Conduct of Research* (1 page), *Sponsor and Co-Sponsor Statements* (6 pages)*, Letters of Support from Collaborators, Contributors, and Consultants* (6 pages), Description of Institutional Environment and Commitment to Training (2 pages). This is to be reviewed at the mock study section sessions. |
|  | Mon Nov 13, 2023 | None.  **Tuhina out of town** | Mock study section session 1 (20 min per application). Participants: Katrina Bazemore, Julia Ditosto (faculty: Beth Pineles, Adam Naj), Mattia Mah’moud, Chris Miller (Michael Harhay, Sunni Mumford) | None. |
|  | Wed Nov 15, 2023 | None.  **Tuhina out of town** | Mock study section session 2 (20 min per application). Participants: Naria Sealy, Haedi Thelen (faculty: David Margolis, Karen Glanz), Kelli Williams, Kira Nightingale (faculty: Anne Marie McCarthy, Enrique Schisterman) | None. |
|  | Mon Nov 20, 2023 | Karen Glanz: Lecture/discussion style – basics of deciding where to submit, how to target to a journal/audience, the submission & editorial process, etc. | TBA |  |
|  | Wed Nov 22, 2023 | No class: Day before Thanksgiving | | |
|  | Mon Nov 27, 2023 | Karen Glanz: Giving participants/students an article and asking them to (a) review and (b) suggest edits to the manuscript | TBA | 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. <https://www.atsjournals.org/doi/full/10.1513/AnnalsATS.201808-564PS> |
|  | Wed Nov 29, 2023 | Ellie Caniglia: Reporting the results of emulated trials and propensity score methods | TBA | Read: Lang TA, Altman DG. Basic statistical reporting for articles published in biomedical journals: the “Statistical Analyses and Methods in the Published Literature” or the SAMPL Guidelines. Int J Nurs Stud. 2015 Jan 1;52(1):5-9. <https://inspect-lb.org/wp-content/uploads/2020/06/Statistical-Reporting-Lang-2015.pdf>  Smart P, Maisonneuve H, Polderman A. The EASE Science Editors’ Handbook, 2nd ed.West Clandon, UK: European Association of Science Editors; 2013. <https://www.equator-network.org/2013/02/11/sampl-guidelines-for-statistical-reporting/>  Assel M, Sjoberg D, Elders A, Wang X, Huo D, Botchway A, Delfino K, Fan Y, Zhao Z, Koyama T, Hollenbeck B. Guidelines for reporting of statistics for clinical research in urology. BJU international. 2019 Mar;123(3):401-10. <https://bjui-journals.onlinelibrary.wiley.com/doi/pdfdirect/10.1111/bju.14640?casa_token=aBygaW6eQC4AAAAA:ippiLgW90KalCKSVxVlt5aiVylsr5mgFP7DUvCVQ2VeyUzLOtyf5-y3d7PxEAf-zc6zD8pWCBadtgrw>  Read: American College of Physicians. Information for authors – general statistical guidance. Ann Intern Med. <https://annals.org/aim/pages/author-information-statistics-only>  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. <https://www.atsjournals.org/doi/10.1164/rccm.202003-0477ED> |
|  | Fri, Dec 1, 2023 (no class) | Submit all required F30/31 materials to Marianne Altland altland@pennmedicine.upenn.edu in the BGS business office. | | |
|  | Mon Dec 4, 2023 | Michael Harhay: Guidelines for statistical reporting in papers | TBA |  |
|  | Wed Dec 6, 2023 | TBA | TBA |  |
|  | Mon Dec 11, 2023 | TBA | TBA |  |