

MCB 540: Scientific Writing Fall 2023

Tuesdays and Thursdays, 12:30-1:50
3 credit hours

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Ask questions over email, and we will reply within 24 hours. Answers to frequent questions will be posted in the FAQ forum.

Office hours: Please use workshop time to discuss individual questions with Dr. Smith-Bolton or Dr. Slauch. If a concern/question needs a more in-depth discussion, email to make an appointment.

The **class website** is on Moodle

Course Overview: This course is for graduate students in the biological sciences, broadly defined, who are currently working on thesis projects in a research lab. Students will learn how to write grant proposals in the NIH style, which will also be applicable to funding agencies such as NSF.

Course Learning Outcomes. Students in this class are at different points in their careers with different writing backgrounds. This class is designed to be flexible to help everyone move forward regardless of where they are starting. Students also have different immediate writing needs, depending on where they are in their Ph.D. programs. Although this course will focus on grant writing for most written assignments, we will also cover manuscript writing and briefly touch on preparation of figures and oral presentations. As you will see, basic concepts for all presentation styles overlap significantly. We will also stress writing fundamentals, which will help for all types of scientific writing. These approaches will help students achieve the following learning

outcomes:

Learn how to construct a compelling narrative about your research

Master key aspects of English grammar

Write an NIH-style fellowship grant proposal

Required Texts:

Scientific Writing and Communication: Papers, Proposals, and Presentations. Angelika H. Hofmann. Oxford University Press, 5th edition. Available on Amazon and in the Illini Union Bookstore. You may use an older edition.

The Grant Application Writer's Workbook by Stephen W. Russell and David C. Morrison. NIH Version. The latest edition is Forms H. Many MCB labs have a lab copy of this book available for student use, although they may be earlier editions. Students may use these earlier editions. Portions of multiple editions will be posted on the website in pdf form when the advice has changed between editions.
<http://www.grantcentral.com/workbooks/national-institutes-of-health/>

Suggested Texts:

Houston, We Have a Narrative. Randy Olson. The University of Chicago Press, 2015. The section we will read for class is posted as a pdf on the website.

Elements of Style by Strunk and White (Classic and only a few dollars)

Class Format: Each class will include a combination of writing exercises, discussions, and group editing workshop. The lectures will cover grammar, writing mechanics, narrative, as well as specific types of scientific writing or grant components. In small groups we will read and edit working drafts. You may either post a Google Docs link or share a Microsoft Word document that you have saved to OneDrive with your group. We expect these drafts will be a work-in-progress. Do your best to critique each other's assignments constructively. This critique will be part of your grade.

Groups: We will try to group you by scientific interest so the focus in the group discussions can be on the writing and not on questions about the science. However, you will not be in a group with someone in the same lab.

Grading rubrics: The rubrics will tell you exactly what we will look for when we evaluate each assignment. Use them as a guide when commenting on each other's writing.

Graded Writing Assignments: Several assignments will be handed in to us after you have had a chance to make revisions based on your classmates' comments. We spend a lot of time with each writing sample and comment extensively – don't be discouraged by these critiques as everyone is in the same boat, even the course instructors who get written, often brutally honest, critiques from colleagues on each of their NIH grant applications. Our goal is to move each person forward in terms of their scientific writing abilities, regardless of their starting point.

6 graded writing assignments:

1. Abstract: We will use this assignment as a benchmark to see everyone's starting place.
2. Specific Aims page: We spend a great deal of time on this section because it is so important!
3. Significance
4. One Aim of the approach section of a proposal
5. A manuscript introduction
6. Final project: A 7-page grant proposal, NIH-style. The weekly writing assignments and graded assignments will build toward this final project.

Mock Study Section: In place of a final exam, we will conduct a mock NIH study section. Participation will count toward your final grade. This exercise has been a lot of fun and very informative in past years. Your proposals will have primary and secondary reviewers, and we will discuss the proposals as a group. You will not be on the study section that reviews your proposal.

Syllabus:

August 22	<u>Lecture topics:</u> Class organization, Approach to writing <u>Reading assignment:</u> Hofmann Chapter 1, Chapter 8.6 (Paraphrasing)
August 24	<u>Lecture topics:</u> Principles of narrative <u>Reading assignment:</u> Olson Chapter 7
August 29	<u>Lecture topics:</u> Concise writing; run-on and compound sentences <u>Reading assignment:</u> Hofmann Chapter 4
August 31	<u>Lecture topics:</u> Sentence structure, scientific jargon <u>Reading assignment:</u> Hofmann Chapters 2 and 3
September 5	<u>Lecture topics:</u> Paragraph organization I, punctuation, abstracts <u>Reading assignment:</u> Hofmann Chapters 6 and 14
September 7	<u>Lecture topics:</u> Redundancies in writing, overusing words; What happens in an NIH study section <u>Reading assignment:</u> NIH review criteria and instructions <u>Writing assignment due:</u> Abstract draft 1
September 12	<u>Lecture topics:</u> Paragraph organization II: transitions and signposts <u>Writing assignment due:</u> Abstract draft 2
September 14	<u>Lecture topics:</u> Specific Aims I: setting the framework and stating the problem to be solved; Verb tense <u>Reading assignment:</u> Chapters 7 and 8 in Grant Writer's Workbook <u>Writing assignment due:</u> Final Abstract
September 19	<u>Lecture topics:</u> Specific Aims II: Conveying your objective and hypothesis; Active vs passive voice in writing <u>Writing assignment due:</u> Draft of Specific Aims
September 21	<u>Lecture topics:</u> Specific Aims III: developing your aims; Parallel construction <u>Writing assignment due:</u> Draft 2 of Specific Aims
September 26	<u>Lecture topics:</u> Specific Aims IV: broader impacts; Singular vs. plural in writing <u>Writing assignment due:</u> Draft 3 of Specific Aims

- September 28 Lecture topics: Significance I: Significance/Innovation, Scientific Premise and Rigor of Prior Work; Citations
Reading assignment: Chapter 10 (2016/2019) and Chapter 9 (2011) in Grant Writer's Workbook
Writing assignment due: Draft of Specific Aims
- October 3 Lecture topics: Significance II; that/which/this
Writing assignment due: **Final Specific Aims**
- October 5 Lecture topic: Approach I – overall structure and introduction; Split infinitives
Reading assignment: Chapters 10 and 11 of Grant Writer's Workbook (2011)
Writing assignment due: Draft of Significance
- October 10 Lecture topic: Approach II - justification and feasibility
Writing Assignment due: Draft of Significance
- October 12 Lecture topics: Figures, legends, ethics of image manipulation, Hyphenated adjectives
Writing Assignments due: **Final Significance**; Draft of one aim of approach
- October 17 Lecture topic: Approach III: research design, rigor and reproducibility
Writing Assignment due: figure + legend
- October 19 Lecture topic: Approach IV: expected outcomes, potential problems, and alternative strategies
Writing Assignment due: Draft of one aim
- October 24 Lecture topics: Future Directions and Timeline
Writing Assignment due: Draft of one aim
- October 26 Lecture topic: Remaining grant components, including biosketch and training plan
Reading assignment: Skim chapters 12-20 of Grant Writer's Workbook
Writing Assignment due: Drafts of one aim, future directions
- October 31 Lecture Topic: Ethics
Writing Assignment Due: **Final Aim**
- November 2 Lecture Topic: Manuscript Introductions
Reading assignment: Hofmann Ch. 10

November 7	<u>Lecture Topics</u> : Manuscript Introductions II; Materials and Methods <u>Reading assignment</u> : Hofmann Ch. 11
November 9	<u>Lecture Topics</u> : Results; How to state conclusions <u>Reading assignment</u> : Hofmann Ch. 12 <u>Writing assignment due</u> : Draft of introduction
November 14	<u>Lecture Topic</u> : Discussions <u>Reading assignment</u> : Hofmann Ch. 13 <u>Writing assignments due</u> : Draft of Specific Aims; Final Introduction
November 16	<u>Lecture Topic</u> : Submitting manuscripts, interpreting the reviews <u>Writing assignment due</u> : Draft of Significance
November 28	<u>Lecture Topic</u> : slides and presentations <u>Writing assignment due</u> : Draft of <u>all aims</u> of approach
November 30	<u>Lecture Topic</u> : N/A <u>Assignment due</u> : Prepare one slide to help with elevator pitch
December 5	<u>Lecture Topic</u> : Study Sections <u>Writing assignment due</u> : Draft of final project for group, or whichever part with which you'd like last-minute help
Date TBD	Final Project Due , upload as one document
Date TBD	Mock study section. Usually held during the time assigned for final exams for this class period, so plan to be present. You will be sent your reviewer assignments by email.

Summary of graded pieces due; please submit as a Word document

September 14	Abstract
October 3	Specific Aims
October 12	Significance
October 31	One Aim of Approach
November 14	Manuscript Introduction
TBD	Final Project Grant Proposal

Policies

Grading

- 10% Each graded writing assignment that isn't the final project (5 total)
- 20% Class participation (includes attendance and group participation)
- 20% Final project
- 10% Study section participation

Assignments submitted late will still be graded but will have points deducted based on how late they are.

Sentences found to be plagiarized will be deleted from the submission, and the remaining original work will be graded.

We will discuss how numeric scores will translate to letter grades on the first day of class.

Attendance

For this class to work well for all students, group members must be present and participate in group editing sessions. For unavoidable absences, contact the course instructors and arrange with your group to review drafts electronically.

Academic Integrity Statement

The University of Illinois at Urbana-Champaign *Student Code* should also be considered as a part of this syllabus. Students should pay particular attention to Article 1, Part 4: Academic Integrity. Read the Code at the following URL: <http://studentcode.illinois.edu/> .

Academic dishonesty may result in a failing grade. Every student is expected to review and abide by the Academic Integrity Policy: <http://studentcode.illinois.edu/>. Ignorance is not an excuse for any academic dishonesty. It is your responsibility to read this policy to avoid any misunderstanding. Do not hesitate to ask the instructor(s) if you are ever in doubt about what constitutes plagiarism, cheating, or any other breach of academic integrity.

Given that MCB 540 is a writing course, plagiarism will be taken very seriously. We will discuss plagiarism and other aspects of scientific fraud that can impact science writing multiple times during the course.

Generative Artificial Intelligence Policy

You may not use generative artificial intelligence programs such as ChatGPT to write for you or augment your writing in this course. There are at least two reasons to be deeply cautious when using such tools:

- 1) These tools are designed to write prose that sounds good, but they do not care if what they write is true or accurate. An AI tool will create imaginary facts and

citations. Your grader may miss factual mistakes in your writing, but your committees and reviewers in the real world will not.

- 2) Anything entered into a generative AI tool becomes the property of that tool and can be used in the future. It may use your ideas and hypotheses and data when it writes content for others. Imagine a competitor asking ChatGPT for help with a proposal and being fed substantial content from your draft.

Accommodations Statement

To obtain disability-related academic adjustments and/or auxiliary aids, students with disabilities must contact the course instructor and the Disability Resources and Educational Services (DRES) as soon as possible. To contact DRES, you may visit 1207 S. Oak St., Champaign, call 333-4603 (V/TDD), or e-mail a message to disability@uiuc.edu. <http://www.disability.illinois.edu/>.

Emergency Response Statement

Emergency response recommendations can be found at the following website: <http://police.illinois.edu/emergency-preparedness/>. I encourage you to review this website and the campus building floor plans website within the first 10 days of class. <http://police.illinois.edu/emergency-preparedness/building-emergency-action-plans/>.

Family Educational Rights and Privacy Act Statement

Any student who has suppressed their directory information pursuant to *Family Educational Rights and Privacy Act* (FERPA) should self-identify to the instructor to ensure protection of the privacy of their attendance in this course.

See <https://registrar.illinois.edu/academic-records/ferpa/> for more information on FERPA.

Sexual Misconduct Policy and Reporting Statement

The University of Illinois is committed to combating sexual misconduct. Faculty and staff members are required to report any instances of sexual misconduct to the University's Title IX and Disability Office. In turn, an individual with the Title IX and Disability Office will provide information about rights and options, including accommodations, support services, the campus disciplinary process, and law enforcement options.

A list of the designated University employees who, as counselors, confidential advisors, and medical professionals, do not have this reporting responsibility and can maintain confidentiality, can be found here: wecare.illinois.edu/resources/students/#confidential.

Other information about resources and reporting is available here: wecare.illinois.edu.

Inclusive Classroom Statement

The effectiveness of this course is dependent upon the creation of an encouraging and safe classroom environment. Exclusionary, offensive or harmful speech, such as racism, sexism, homophobia, and transphobia, will not be tolerated and in some cases will be subject to University harassment procedures. We are all responsible for creating

a positive and safe environment that allows all students equal respect and comfort. We expect each of you to help establish and maintain an environment where you and your peers can contribute without fear of ridicule or intolerant or offensive language.