

## MCB 540: Scientific Writing Fall 2024

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

Dr. Rachel Smith-Bolton (lecturing and grading)  
rsbolton@illinois.edu

Dr. Jim Slauch (lecturing and grading)  
slauch@illinois.edu

Dr. Gary Olsen (grading)  
gjo@illinois.edu

Dr. Nien-Pei Tsai (grading)  
nptsai@illinois.edu

Dr. Yan Zhang (grading)  
yanzuiuc@illinois.edu

Dr. Keith Jarosinski (grading)  
kj4@illinois.edu

Ask questions over email, and we will reply within 24 hours. Answers to frequent questions will be sent to the whole class.

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 Canvas, which will serve as a portal to the course 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, 5<sup>th</sup> 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:** 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 27    | <u>Lecture topics:</u> Class organization, Approach to writing<br><u>Reading assignment:</u> Hofmann Chapter 1, Chapter 8.6<br>(Paraphrasing)  |
| August 29    | <u>Lecture topics:</u> Principles of narrative<br><u>Reading assignment:</u> Olson Chapter 7   |
| September 3  | <u>Lecture topics:</u> Concise writing; run-on and compound sentences<br><u>Reading assignment:</u> Hofmann Chapter 4  |
| September 5  | <u>Lecture topics:</u> Sentence structure, scientific jargon<br><u>Reading assignment:</u> Hofmann Chapters 2 and 3  |
| September 10 | <u>Lecture topics:</u> Paragraph organization I, punctuation, abstracts<br><u>Reading assignment:</u> Hofmann Chapters 6 and 14  |
| September 12 | <u>Lecture topics:</u> Redundancies in writing, overusing words; What happens in an NIH study section<br><u>Reading assignment:</u> NIH review criteria and instructions<br><u>Writing assignment due:</u> Abstract draft 1                      |
| September 17 | <u>Lecture topics:</u> Paragraph organization II: transitions and signposts<br><u>Writing assignment due:</u> Abstract draft 2   |
| September 19 | <u>Lecture topics:</u> Specific Aims I: setting the framework and stating the problem to be solved; Verb tense<br><u>Reading assignment:</u> Chapters 7 and 8 in Grant Writer's Workbook<br><u>Writing assignment due:</u> <b>Final Abstract</b> |
| September 24 | <u>Lecture topics:</u> Specific Aims II: Conveying your objective and hypothesis; Active vs passive voice in writing<br><u>Writing assignment due:</u> Draft of Specific Aims  |
| September 26 | <u>Lecture topics:</u> Specific Aims III: developing your aims; Parallel construction<br><u>Writing assignment due:</u> Draft 2 of Specific Aims   |
| October 1    | <u>Lecture topics:</u> Specific Aims IV: broader impacts; Singular vs. plural in writing<br><u>Writing assignment due:</u> Draft 3 of Specific Aims  |

- October 3            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 8            Lecture topics: Significance II; that/which/this  
Writing assignment due: **Final Specific Aims**
- October 10           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 15           Lecture topic: Approach II - justification and feasibility  
Writing Assignment due: Draft of Significance
- October 17           Lecture topics: Figures, legends, ethics of image manipulation, Hyphenated adjectives  
Writing Assignments due: **Final Significance**; Draft of one aim of approach
- October 22           Lecture topic: Approach III: research design, rigor and reproducibility  
Writing Assignment due: figure + legend
- October 24           Lecture topic: Approach IV: expected outcomes, potential problems, and alternative strategies  
Writing Assignment due: Draft of one aim
- October 29           Lecture topics: Future Directions and Timeline  
Writing Assignment due: Draft of one aim
- October 31           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
- November 5           Lecture Topic: Ethics  
Writing Assignment Due: **Final Aim**
- November 7           Lecture Topic: Manuscript Introductions  
Reading assignment: Hofmann Ch. 10

|             |  |
|-------------|--|
| November 12 | <u>Lecture Topics</u> : Manuscript Introductions II; Materials and Methods<br><u>Reading assignment</u> : Hofmann Ch. 11   |
| November 14 | <u>Lecture Topics</u> : Results; How to state conclusions<br><u>Reading assignment</u> : Hofmann Ch. 12<br><u>Writing assignment due</u> : Draft of introduction             |
| November 19 | <u>Lecture Topic</u> : Discussions<br><u>Reading assignment</u> : Hofmann Ch. 13<br><u>Writing assignments due</u> : Draft of Specific Aims; <b>Final Introduction</b>       |
| November 21 | <u>Lecture Topic</u> : Submitting manuscripts, interpreting the reviews<br><u>Writing assignment due</u> : Draft of Significance   |
| December 3  | <u>Lecture Topic</u> : slides and presentations<br><u>Writing assignment due</u> : Draft of <u>all aims</u> of approach  |
| December 5  | <u>Lecture Topic</u> : N/A<br><u>Assignment due</u> : Prepare one slide to help with elevator pitch  |
| December 10 | <u>Lecture Topic</u> : Study Sections<br><u>Writing assignment due</u> : Draft of final project for group, or whichever part with which you'd like last-minute help          |
| Date TBD    | <b>Final Project Due</b> , 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 19 | Abstract                     |
| October 8    | Specific Aims                |
| October 17   | Significance                 |
| November 5   | One Aim of Approach          |
| November 19  | Manuscript Introduction      |
| TBD          | Final Project Grant Proposal |

## **Policies**

### **Grading**

- 10% Each graded writing assignment, except 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](mailto: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](http://wecare.illinois.edu/resources/students/#confidential).

Other information about resources and reporting is available here: [wecare.illinois.edu](http://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.