

## Biochemistry 460, Fall 2021, Syllabus

**Time: Tuesday and Thursday, 3:30-4:50 P.M. 100 Noyes Laboratory**

**Course Delivery: Class will be delivered in person in 100 Noyes Lab. This is a large lecture room with lots of space to achieve physical separation from others.**

We will also be recording the talks by Zoom as they are presented. Zoom quality from this environment will not be outstanding. **The expectation is that students will attend in person.** In some classes, for part of the class, students normally will break into small groups or teams to review each others work and discuss how to best present information and research. This small group work to edit and improve your written work was a significant part of the class. Last year we did this via Zoom with me moving remotely between the groups and it was imperfect. How we will implement this will depend on where the campus community is as the semester unfolds. (Before SARS-CoV-2 the course was delivered in 419 RAL. Unlike classrooms, this room has movable tables and chairs that facilitate small group work. Because the room was packed, it can no longer be used to deliver the course. For our safety, this course, and many others, will be delivered in a much larger classroom, enabling students to distance themselves from each other.)

**TEXTS:** There are no required tests

### **Highly Recommended**

Angelika H. Hofmann. Scientific Writing and Communication: Papers, Proposals and Presentations

Oxford Univ. press (4<sup>th</sup> Edition) ISBN-13: 978-0190063283

#### Advantages

Prof Hofmann teaches Yale's scientific writing course, knows the topic

Many examples; shows how to improve poor writing

List of strong and weak ways to make certain kinds of common statements in papers

#### Disadvantages

Dense

Writing is clear, but not especially interesting to read.

Sections on giving presentations and preparing posters are weaker than the sections on writing papers.

### **Recommended**

Stephen A. Heard. The Scientists Guide to Writing: How to Write More Easily and Effectively Throughout your Scientific Career.

Princeton University press (2016) ISBN: 978-0-691-17021-3

Inexpensive

#### Advantages

Very strong user reviews on Amazon.

Easier to read than Hofmann but less comprehensive

Has a fair number of examples

Goes through the entire process from start to reading reviewers comments

### Disadvantages

Easy chatty style means it sometimes takes longer to get to the actual material you need.

Joshua Schimel. Writing Science: How to Write Papers that Get Cited and Proposals that Get Funded.

(ISBN-13: 978-0199760244 ISBN-10: 0199760241)

### Advantages

Big Picture

Highly readable

High purchaser ratings on Amazon: 4.7/5

### Disadvantages

May not be specific enough for a beginning student

### **More Specialized**

Hilars Glasman-Deal. Science Writing for Non-native Speakers of English

ISBN-13: 978-1848163102, ISBN-10: 184816310

Very strong user reviews on Amazon: 4.7/5 22

PhraseBook for Writing Papers and Research in English

Stephen Howe and Kristina Henriksson

ISBN-13: 978-1492959793, ISBN-10: 1492959790

Solid reviews; There are specific issues that come up in many papers and reader-friendly phrases that address these issues and make papers much easier to follow.

**This class does NOT closely mirror the chapter-by-chapter content of these books.**

**Instructor:** Professor David Shapiro

Office Hours: I and the T.A.s will have office hours. These are expected to be in person during specific times. At this time, each of us will be wearing a good quality mask. For more intensive meetings with the T.A.s later in the semester, where it is not easy to maintain distance, our expectation is that everyone will have received a negative test the day before their 1-hour meeting with the T.A.

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Specific meeting times will be scheduled for going over the draft of the journal article.

**Prerequisites:** MCB354, MCB253 or Biochemistry 455 lab and completion of composition 1 requirement

**Course Overview and Objectives:** As research scientists, physicians and health professionals you will need to communicate your ideas, refine your thoughts and be able to discuss them, and constructively criticize and interact with others. As physicians and health professionals, you will need to process information provided by patients and clinical tests, use that information to formulate a diagnosis and treatment plan and communicate clearly and effectively with patients and health care team professionals. This course is designed to give you the opportunities to explore these areas and help you develop and refine your skills. The focus is primarily on scientific writing for scientists and for non-scientists.

The course is structured with a lecture/discussion of a topic in scientific writing. Often, the students will write material related to that topic, distribute it to their group, and then hopefully be able to critique each other's writing in small groups with overall guidance from the instructor. Notably, The School of Molecular and Cellular Biology is implementing a required scientific writing course for graduate students

**What we will do this semester:**

### **RESEARCH JOURNAL ARTICLE**

The major writing task is writing a journal article. We provide real current experimental data that the researchers expect to ultimately submit for publication. Lectures provide scientific background and context for the topic and guidance for writing each section of the manuscript. You will use this information to produce figures and write a scientific paper. As you write each section of the manuscript it will be refined in discussions with other students. Based on student input we require that students also submit the sections of the manuscript that are being critiqued. If the student has made a sincere effort to write the section due for small group discussion that week, it will be deemed satisfactory. The initial draft is handed in and reviewed and graded by the teaching assistants who will then meet with each of you remotely and provide one-on-one guidance and suggestions for ways to improve the final draft of the manuscript. (An alternative approach in which each student writes a grant proposal is not practical. Quite a few students in the class are not presently working in a research lab; this would put them at a major disadvantage in writing a grant based on their research.)

In Chronologic Order

### **PERSONAL LETTER**

A description of your background and what you hope to gain from the class. Because this contains personal information, it will be graded by the instructors and will NOT be reviewed in the small groups.

### **WATSON-CRICK ABSTRACT**

The classic Nature papers describing the structure of DNA do not contain an abstract. We will discuss how to write compelling, attention-getting abstracts and you will write a

single Abstract covering both of these papers. Your abstract will be refined in small group discussions and you will also read and critique the Abstracts of others. A few of your Abstracts will be read in class.

### **GRANT PROPOSAL ABSTRACTS**

We will provide a grant proposal without the Abstracts. You will use that proposal to prepare a Technical Abstract for research scientists and a Public or Lay Abstract for non-specialists.

### **RESEARCH JOURNAL ARTICLE**

Sections

Graded Draft

Final Manuscript with Press Release for your Journal Article

### **GRADING**

1. Personal Letter	2
2. Watson-Crick Paper Abstract	6
3A. Grant: Technical Abstract	6
3B Grant: Public Abstract	6
4A. Journal Article, Assignments S/U	- (If U, lower grade for participation)
4B Journal Article, Draft	11
4C Journal Article, Final	52
4D Press Release for Journal Article	8
5. Class Participation	9

Ungraded: Reviewing Hall Posters. We will try to work out a way to do this safely. In the past we did this in small groups. This year we will need to do more to stagger times so each of you can maintain physical separation from classmates and others in the corridors.

**It's a lot for all of us to deal with, but there are no written exams.**

### **GRADING WRITING**

The answer to a True-False or multiple choice question is normally either correct or incorrect. Grading writing is more nuanced and, in part, comes from how the various elements of a document come together. It is therefore nearly impossible to provide a detailed explanation for why something is graded as 8, rather than 8.5. We recognize that you are not experienced writers and will grade accordingly.

We will provide more details on how your writing is graded later this semester.

### **SUBMITTING WRITING ASSIGNMENTS**

### **PRELIMINARY CLASS SCHEDULE**

There will probably be one or two guest lectures in person or by Zoom. Dates TBD

Past guest lecturers

**Diana Yates.** Life Sciences Editor, UIUC News Bureau

**Prof. Robert Switzer.** Our most accomplished author: Technical: Published a highly successful biochemistry laboratory manual “Experimental Biochemistry”: Non-fiction: An autobiographical work about his early “Life on a Farm”: Fiction: “The Lady Professor” a historical novel about an early woman scientist.

### **Week 1. Aug. 24 and 26**

Jeff Goldberg

Schedule and Course Overview

Types of scientific communication

“The Science of Scientific Writing” Gopen and Swan, American Scientist, 1990

### **ASSIGNMENT 1: PERSONAL LETTER DUE BY 5 P.M., Tuesday Aug. 31**

### **Week 2. Aug. 31 and Sep. 2**

Class Discussion of Gopen and Swan

Common errors and problems in scientific writing

Writing Abstract’s for manuscripts

Nature’s overview of how to create a compelling short abstract

Short descriptive abstracts in high profile papers

### **ASSIGNMENT 2: DRAFT OF WATSON-CRICK ABSTRACT (<100 WORDS), ABSTRACT DUE FOR YOUR PANEL BY 5 P.M. WED SEP. 1**

**Discussion of your Abstracts in small groups on Thursday SEP. 2.** (During part of the class time)

### **Week 3. Sep. 7 and 9**

### **ASSIGNMENT 2: WATSON-CRICK ABSTRACTS (maximum of 100 words) DUE BY 11:59 P.M. Sat, Sep. 4.**

Overview of grant proposal contents

#### **Technical Abstracts:**

A mini-grant in one page.

Balancing details about goals with the big picture of why the reader should care

#### **Public Abstracts:**

Writing for the informed public and non-specialist

Researchers. Keeping specialist readers, patients, and non-specialists engaged.

Replacing jargon in the abstract.

**Week 4. Sep. 14 and 16**

How to engender reader enthusiasm for grant abstracts  
Grant review process  
Guest lecture

**ASSIGNMENT 3A: Draft of Technical Abstract due for small team by 5 P.M.,  
Wednesday, Sep. 15**

**ASSIGNMENT 3B: Draft of Public Abstract due for small team by 5 P.M., Monday  
Sep. 20.**

**Week 5. Sep. 21 and 23**

**ASSIGNMENT 3A AND 3B TECHNICAL AND PUBLIC ABSTRACTS DUE BY 11:59  
P.M. SATURDAY, SEP. 25**

Longer JBC/Biochemistry-style abstracts that contain more experimental results; usually  
150-250 words.

Evolution of an actual Abstract through several drafts

In small panels and in full class

Overview of research article expectations

Organizing information for a research article

Background and information for the research article

Data for the research article

**Week 6. Sep. 28 and 30**

Organizing data in figures

Outlining the main themes of the paper

Format and section content, Titles

Highlights and One-line descriptors

Common problems in scientific writing

Strategies for a strong Introduction

**ASSIGNMENT 4A RESEARCH ARTICLE: Drafts of Figures to your team  
Wednesday, Sep. 29, 5 P.M., for review ON Thursday Sep. 30**

**Week 7. Oct. 5 and 7**

**ASSIGNMENT 4A RESEARCH ARTICLE: BY 11:59 P.M., Monday Oct. 4  
Draft of Title, brief one-line descriptors and Introduction to small panel for review.**

Preparing figures, doing calculations, presenting data, Tables graphs etc.

Writing the Results, Organizing the results so they experiments flow logically and you  
say what you intended to say.

Discussion. Don't just repeat the results  
Identifying how the findings fit into the larger scheme.  
How do these data relate to prior knowledge?

**Week 8. Oct. 12 and 14**

**ASSIGNMENT 4A RESEARCH ARTICLE: Sunday, Oct. 10, 11:59 P.M. Draft of Experimental Procedures (Materials and Methods) and Results with Figures to small team for review.**

Finding things to discuss when you are not an expert in the field  
A Discussion that does more than go over the data  
References and literature searches

**Week 9. Oct. 19 and 21**

**ASSIGNMENT 4A RESEARCH ARTICLE: Sunday Oct. 17 11:59 P.M. Draft of Discussion to small team**

Guest lecture  
Assembling a finished manuscript  
Writing for the informed general public

**Week 10. Oct. 26 and 28**

**ASSIGNMENT 4A RESEARCH ARTICLE: Sunday Oct. 24 11:59 P.M. Draft of complete manuscript including Title, Descriptors, Abstract, Introduction, Methods, Figures and Figure legends, Results, Discussion to small team.**

**Week 11. Nov. 2 and 4**

Going from your research paper to a press release  
Evolution of two press releases  
Writing compelling abstracts for meetings  
Keys to effective presentations

**ASSIGNMENT 4B RESEARCH ARTICLE: DRAFT DUE: Draft submitted for our grading and comments by 11:59 P.M, Monday, Nov. 1**

**Week 12. Nov. 9 and 11**

**NO CLASS, INDIVIDUAL MEETINGS WITH TAs TO GO OVER YOUR DRAFTS (Be sure to sign up for an appointment)**

**Week 13. Nov. 16 and 18.**

How to organize a poster

Turning your research paper into a poster

Rating the 3<sup>rd</sup> and 4<sup>th</sup> floor posters

(This will have to be done in a staggered way so that students do not congregate at posters. It will likely extend beyond class hours. Currently, this is in person in RAL. This is NOT graded. If you are not on-campus, or are concerned about safety you are not required to participate. There will be no penalty. Alternatively, we are looking into supplying the posters to you electronically. But this does not resemble how you would see them in person at a scientific meeting.

**Week Nov. 23 and 25**

**Fall Thanksgiving break, no classes**

**Week 14. Nov. 30 and Dec. 2**

Common writing problems that emerged, your suggestions for improvement

**ASSIGNMENT 4A RESEARCH ARTICLE: Press release to small panel for review by 11:59 P.M. Wed. Dec. 1.**

**Week 15. Dec. 7**

Having trouble with your Discussion, some possible topics

Course overview, your suggestions for improvement

**ASSIGNMENTS 4C and 4D RESEARCH ARTICLE: FINAL MANUSCRIPT AND PRESS RELEASE**

**DUE Date is: 11:59 P.M. Wed., DEC. 15.**

**This is the last date we can properly receive the your papers and be able to grade them in time to give out final semester grades.**