

BIOL 4300W: Scientific Research Writing

TTH 9:30 - 10:15am

Dr. Holly Gallagher
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402 Biological Sciences Building
Office hours: by appointment*

**I encourage you to make appointments with me to discuss your work.*



<https://www.nature.com/scitable/ebooks/english-communication-for-scientists-14053993/writing-scientific-papers-14239285/>

“If your research does not generate papers, it might just as well not have been done.”
– G. M. Whitesides

PREREQUISITES: none

3 credits, graded A-F

This course counts as an upper-level general elective (towards the 39-hour rule)

COURSE DESCRIPTION:

In this course, students will examine recent peer-reviewed scientific writing, consider the strategies of successful scientific writers, learn writing conventions of scientific journals, and workshop student writing. Students will develop skills for achieving concise wording and clarity of thought

while communicating science. If you are engaged in undergraduate research, you can work on your research paper during the course.

COURSE GOALS:

BIOL 4300W is designed to teach you the conventions of scientific research papers. In class you will receive substantial feedback from me and from your peers.

This class is designed to teach undergraduate students in the sciences to:

- gather published and unpublished sources of information and bring them to bear on scientific questions,
- analyze scientific writing and use the writing as a model,
- access electronic sources of information, including but not limited to internet searches, library databases, and public information and data,
- discover and represent the research conversation that the written article aims to join,
- learn the structure and functions of different components of scientific papers to effectively communicate scientific findings,
- learn techniques for effective communication of scientific information,
- achieve brevity, clarity, and conciseness in writing.

TEXTS (ALL TEXTS WILL BE AVAILABLE AS PDF'S ON ELC):

- Margaret Cargill and Patrick O'Connor, *Writing Scientific Research Articles: Strategy and Steps*, Wiley-Blackwell, 2013
- Stephen B. Heard, *The Scientist's Guide to Writing: How to Write More Easily and Effectively throughout Your Scientific Career*, Princeton University Press, 2016
- Alberto Cairo, *The Functional Art*, 2012
- Janice R. Matthews and Robert W. Matthews, *Successful Scientific Writing: A Step-by-Step Guide for the Biological and Medical Sciences*, Cambridge University Press, 2014
- Other PDFs

GRADING POLICY:

Assignments (Daily work, Peer Review)	15%
Participation (Attendance, Discussion)	5%
Annotated Bibliography	10%
Literature Review	5%
Academic Writing Journal	5%
Poster/Presentation	10%
IMRAD sections	30%

Final Paper/Portfolio of research writing 20%

ASSIGNMENTS GRADE:

Your Assignments grade is determined by the daily work you turn in. This work will not be graded on an A-F scale, but it will be checked for completeness, thoroughness, and promptness. Your Assignments grade will also include a holistic assessment of the thoroughness of and attention given to your peer reviews.

PARTICIPATION GRADE:

Your participation grade will be determined by your absences and your participation in class, including your engagement in discussions and the thoroughness of your peer reviews. If you miss class, it is your responsibility to find out what you missed and to make up your work. Workshop participation requires that you bring work in progress to most sessions.

LITERATURE REVIEW:

The purpose of writing this standalone literature review is to represent the research conversation that you're joining with your scientific research article. The review is also a preliminary effort to help you synthesize different research projects and to craft the introduction to your article. Much of what you write in this literature review will not be included in the literature review in your research paper introduction, but it is a behind-the-scenes tool to reflect on the context of your research paper.

ACADEMIC WRITING JOURNAL:

As a researcher, it's important to stay current on research in your scientific discipline. Over the semester, you will make an effort to read recent published research. For your annotated bibliography assignment, you get *depth* of understanding by closely analyzing research articles. For this assignment, you are asked to get an idea of the *scope* of research published in journals of interest.

PLUS/MINUS GRADING:

Plus and minus grades are assigned to a student's final average for the course. For the course grade, the grade-point average and the numerical range for each plus/minus grade is as follows:

A 4.0 (92-100)

A- 3.7 (90-91)

B+ 3.3 (88-89)

B 3.0 (82-87)

B- 2.7 (80-81)

C+ 2.3 (78-79)

C 2.0 (70-77)

C- 1.7 (68-69)

D 1.0 (60-67)

F 0.0 (<60)

ABSENCE POLICY:

BIOL 4300W is a series of lectures, discussions, workshops, and peer reviews that require the active involvement of everyone; therefore, attendance is required.

Workshop participation requires that you bring work in progress and actively engage in all parts of the workshop. Failure to do so will adversely affect your Participation grade.

ZOOM ETIQUETTE:

As this class will be conducted online, we will regularly be using Zoom during the scheduled class period. Please mute yourself if you are not talking, so that the background noise is not distracting. If you have a question or a comment, please either unmute and comment, or type it in the chat. When I ask the class questions, please just unmute and respond. We are bound to talk over each other from time to time, but that's okay! It happens in person, too.

COMMUNICATION POLICY:

You are always welcome to email me with any questions or concerns. *Most of the time*, you can expect a response within 24 hours. On the weekend, my response may take longer. Make sure you are using email etiquette and any questions or requests are stated explicitly.

ACADEMIC HONESTY:

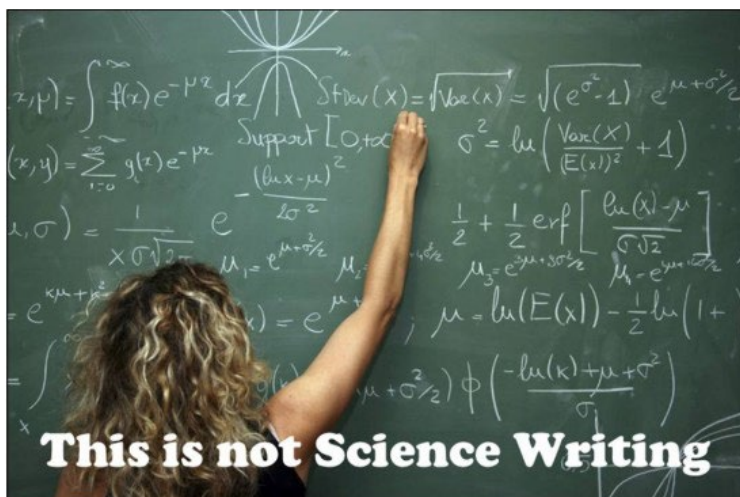
Plagiarism means presenting someone else's work as your own. Types of cheating range from not citing sources properly to submitting an entire paper written by someone else. Penalties may include an F in the course and suspension from the university. According to the University Honor Code & Academic Policy, "*As a University of Georgia student, you have agreed to abide by the University's academic honesty policy, 'A Culture of Honesty,' and the Student Honor Code. All academic work must meet the standards described in 'A Culture of Honesty' found at www.uga.edu/honesty. Lack of knowledge of the academic honesty policy is not a reasonable explanation for a violation. Questions related to course assignments and the academic honesty policy should be directed to the instructor.*"

MENTAL HEALTH AND WELLNESS RESOURCES:

- If you or someone you know needs assistance, you are encouraged to contact Student Care and Outreach in the Division of Student Affairs at 706-542-7774 or visit <https://sco.uga.edu>. They will help you navigate any difficult circumstances you may be facing by connecting you with the appropriate resources or services.
- UGA has several resources for a student seeking mental health services (<https://www.ubs.uga.edu/bewelluga/bewelluga>) or crisis support (<https://www.ubs.uga.edu/info/emergencies>).
- If you need help managing stress anxiety, relationships, etc., please visit BeWellUGA (<https://www.ubs.uga.edu/bewelluga/bewelluga>) for a list of FREE workshops, classes, mentoring, and health coaching led by licensed clinicians and health educators in the University Health Center.
- Additional resources can be accessed through the UGA App.

THE CLASSIC:

Each semester, students are invited to submit their papers to be considered for publication in the *The Classic Journal* (<http://theclassicjournal.uga.edu/>).



<https://www.nextscientist.com/science-writing-human/>

Course Calendar

This course syllabus is a general plan for the course; deviations announced to the class in advance by the instructor may be necessary.

Abbreviations

Writing Scientific Research Articles – WSR A

Stephen Heard, *The Scientist's Guide to Writing – SGW*

Week 1: Introduction to Course

Thu., Aug. 19, 2021- Introduction to course

Week 2: Communicating Science: Research Publications to News

Tue., Aug. 24, 2021 – Genres of Science Writing

Reading due:

Assignment due:

- Browse EurekAlert. Choose one press release article related to your research. Compare the attached scientific research article.

Thur., Aug. 26, 2021 – Analyzing research articles: *Science* and *Nature*; IMRAD structure

Reading due:

- Philip Ball, “It’s Not Just You, Science Papers are Getting Harder to Read,” *Nature News & Comment*, 30 March 2017
- Jennifer Raff, “How to Read and Understand a Scientific Paper”

Assignment due:

- Skim an issue or two of the *Science* to get familiar with the journal
- Skim an issue or two of the *Nature* to get familiar with the journal
- Analyze the article following Raff’s essay “How to Read and Understand a Scientific Paper: A Step-by-Step Guide.” Record notes from your article analysis throughout the process.

Week 3: Library Resources and Choosing Models

Tue., Aug. 31, 2021 – Library Information Session with Ian Thomas

Reading due:

- Read *SGW* 3,4 – Reading, Writing Behavior

Assignment due:

- Two-paragraph reflection on reading and writing practices

Thu., Sep. 2, 2021 – Choosing a Target Journal, Preferred Journals (1,2,3), Selected Articles (1,2,3,4)

- Journal Impact Factor, Predatory Journals.

Reading due:

WSRA, Ch.1: “How the book is organized, and why”

Assignment due:

- First read *WSRA*, Ch.1: “How the book is organized, and why” for guidance on this assignment.

Week 4: Paper Structures, and Papers as Stories

Tue., Sep. 7, 2021 – Types of paper structures / IMRAD

Reading due:

- *SGW*, Ch.8: “The Canonical Structure of the Scientific Paper”
- *WSRA*, Ch.2: “Research article structures”
- *WSRA*, Ch.3: “Reviewers’ criteria for evaluating manuscripts”

Assignment due:

- Import the bibliographic information for your Selected and Guide Articles into EndNote.
- Annotated Bibliography

Thu., Sep. 9, 2021 – Scientific papers as stories

Reading due:

- Read quickly: *SGW*, Ch. 7: “Finding and Telling Your Story”

Assignment due:

- Annotated bibliography sources

Week 5: Writing Style – Writing Style and DNA Papers

Tue., Sep. 14, 2021 – Writing for clarity and conciseness

Reading due:

Assignment due:

- Plan your story by following *SGW*, Ch. 7: “Finding and Telling Your Story.” For your own research, spend a bit more time thinking about your story. Revisit the mini-summary, story summary, and subhead outline you started in class. Revise as you see fit. Post to eLC.
- Annotated bibliography sources

Thu., Sep. 16, 2021 – Comparison of DNA papers

Reading due:

- “April 25, 1953: Three Papers, Three Lessons,” Martin J. Tobin (*American Journal of Respiratory and Critical Care Medicine* vol. 167 2003)
- J. D. Watson and F. H. Crick, “Molecular Structure of Nucleic Acids: A Structure for Deoxyribose Nucleic Acid”
- Franklin, Gosling, “Molecular Configuration in Sodium Thymonucleate” and Wilkins, Stokes, Wilson, “Molecular Structure of Deoxypentose Nucleic Acids”

Assignment due:

- Annotated bibliography sources

Week 6: Methods

Tue., Sep. 21, 2021 – Methods lecture

- Methods workshop selected article and guide article 20 min (and example section?)

Reading due:

- *WSRA*, Ch.7: “The Methods Section”
- *SGW*, Ch.11: “The Methods Section”

Assignment due:

- Add two more sources to your annotated bibliography and update on eLC.

Thu., Sep. 23, 2021 – Methods workshop with selected article

- Assign literature review
- Discuss Methods peer review
- Writing lecture

*Reading due:**Assignment due:*

- Academic Writing Journal Assignment 1

Week 7: Results / Figures and Tables**Tue., Sep. 28, 2021** – Writing lecture; Methods peer review*Reading due:**Assignment due:*

- Methods section, Draft 1

Thu., Sep. 30, 2021 – Figures and Tables: How to present data effectively*Results resources:*

- *WSRA*, Ch. 4: “Results as a ‘story’: the key driver of an article”
- *WSRA*, Ch. 5: “Results: turning data into knowledge”

Assignment due:

- Methods section, Final

Week 8: Results

Tue., Oct. 5, 2021 – Results: How to write prose that complements tables and figures

Results resources:

- *SGW*, Ch.12: “The Results Section”
- *WSRA*, Ch. 6: “Writing about results”

Assignment due:

- Draft of Figures and Tables
- Add one more article to Annotated Bibliography

Thu., Oct. 7, 2021 – Writing lecture; Results Peer Review

Reading due:

Assignment due:

- Results section, Draft 1

Week 9: Introduction

Tue., Oct. 12, 2021 – Introduction lecture, workshop with class example

- jargon

Reading resources:

- *SGW*, Ch.10: “The Introduction Section”

Assignment due:

- Results section, Final

Thu., Oct. 14, 2021 – Introduction lecture, workshop selected articles

Reading due:

Assignment due:

- Literature review due

Week 10: Discussion

Tue., Oct. 19, 2021 – Introduction - Writing lecture (Flow, Summarize, Paraphrase)

Reading due:

- Duke – “What is Scientific Jargon?”

Assignment due:

- Academic Writing Journal Assignment 2
- Introduction section, Draft 1

Thu., Oct. 21, 2021 – Introduction Peer Review

Reading due:

Assignment due:

- Introduction section, Draft 2

Week 11: Discussion

Tue., Oct. 26, 2021 – Discussion lecture

Reading resources:

- *WSRA* Ch.9 “The Discussion section”
- *SGW*, Ch.13: “The Discussion Section”

Assignment due:

- Introduction section, Final

Thu., Oct. 28, 2021 – Writing lecture (Metadiscourse, Transitions, Hedges, Emphatics)

Reading due:

Assignment due:

- Discussion section, Draft 1

Week 12: Discussion, Abstract, Title

Tue., Nov. 2, 2021 – Discussion Peer Review

Reading due:

Assignment due:

- Discussion section, Draft 2

Thu., Nov. 4, 2021 – Abstracts and Titles lecture; Abstract Activity

Reading resources:

- *WSRA*, Ch.9 “The Title”
- *WSRA*, Ch.10 “The Abstract”
- *SGW*, Ch.9: “Front Matter and Abstract”

Assignment due:

- Discussion section, Final

Week 13: Posters and Presentations

Tue., Nov. 9, 2021 – Posters lecture; Abstracts peer review

Reading due:

Assignment due:

- Abstract with title, draft 1
- Academic Writing Journal Assignment 3

Thu., Nov. 11, 2021 – Happy Instructional Day!

Reading due:

Assignment due:

Week 14: Posters, Portfolio, Revision

Tue., Nov. 16, 2021 – Poster Peer Review

Reading due:

Assignment due:

- Draft of presentation (Power Point of poster)

Thu., Nov. 18, 2021 – Portfolio Prep

Reading resource:

- *WSRA*, Ch.15: “A process for preparing a manuscript” (This includes a checklist for reviewing your work before submitting your manuscript. Pay attention to the guidelines that are relevant to you.)

Assignment due:

- Abstract (no more than 250 words), Final

Week 15: Revising and Submitting Your Manuscript

Tue., Nov. 23, 2021 – Putting the sections together; Titles; Submission and authorship for scientific manuscripts; Presentations; Revision

Reading due:

- *WSRA*, Ch.13: “Submitting a manuscript”

Assignment due:

- Follow guidelines in *WSRA*, Ch.13: “Submitting a manuscript”

Thu., Nov. 25, 2021 – Portfolio Peer Review

Reading due:

Assignment due:

- Academic Writing Journal Assignment 4
- Literature Review rewrites due

Week 16: Poster Presentations

Tue., Nov. 30, 2021 – Poster Presentation

Reading due:

- Optional: *WSRA* Ch.12 “Writing review articles”
- Optional: *WSRA* Ch.14 “How to respond to editors and reviewers”
- Optional: *WSRA* Ch.18 “Writing funding proposals”

Assignment due:

Thu., Dec. 2, 2021 – Poster Presentation

Reading due:

Assignment due:

