

## **PTYS 495B: Scientific Writing for the Physical Sciences**

Kuiper Space Sciences Building Room 330, 11 am MWF

**Instructor:** Lynn Carter, [lmcarter@arizona.edu](mailto:lmcarter@arizona.edu)

**Office Hours:** Kuiper 533A, TBD

**Required Textbook:** Joshua Schimel, “Writing Science: How to write papers that get cited and proposals that get funded”, Oxford University Press, 2012.

**Course Description:** As scientists, we are all professional writers. Writing clear and compelling text is extremely important for describing our work to others, participating in the scientific exchange of ideas, and winning fellowships and proposals. This course will introduce undergraduate physical sciences majors to writing a scientific journal article, and they will work to write and revise different sections during the course. Students will be encouraged to write about their own research, especially if they and their research advisor have discussed publishing results. Students can also choose to write a review article of the style found in an “annual reviews” journal.

Mondays and Wednesdays will be lecture/discussion days, including some in-class reading, reviewing and commenting. Fridays will be workshop days, some of which will be free writing time where students can practice writing in timed, scheduled blocks. The course will draw examples from the textbook as well as journals such as Science, Nature, and journals in geosciences, planetary sciences, astronomy, and astrophysics. Students will review published examples, as well as provide feedback to other students through peer review. Most assignments are related to drafting the paper, and students will have multiple opportunities for revising their work before submitting it at the end of the semester.

**Course Learning Objectives:** During this course we will discuss how to write, edit, and publish a scientific paper, and we will also briefly discuss some other types of science writing such as proposals and short blog entries for the public. Topics will include:

- The logistics of publishing a paper, and the different types of scientific papers and their goals.
- The structure of scientific papers, and how structure contributes to producing clear and interesting writing.
- How to write different sections of a scientific paper, including what material goes into each section and how to decide on the detail level and order of topics.
- Production of figures and tables, making accessible figures, and the importance of descriptive captions.
- Editing, including revising for structure, clarity and flow, word use, and removing unnecessary jargon.
- How to peer review a paper, and how to respond to reviewer comments.
- The differences between writing a proposal and writing a scientific paper.
- Ethics in publishing, dealing with uncertainties in your data, and co-authorship.
- Telling the public about your new paper.
- Other types of science writing as an undergraduate: fellowship/scholarship writing and grad applications.

**Course Learning Outcomes:** Upon completion of this course, students will be able to:

- Describe the parts of a typical scientific paper, different types of journals, and how to publish their work.
- Write drafts of paper sections such as the introduction, methods, discussion and conclusions that contain the information needed to understand a science experiment, research project, or topic review.
- Describe and provide examples of how storytelling and structure contribute to clarity and reader interest.
- Critically review papers in the literature and those written by their peers.
- Edit their own work and that of others, specifically including editing of structure, clarity, and language.

### **Grading Scale and Policies**

The course components will have the following weights:

Course Assignments	25%
Friday Workshop Assignments	20%
In-class participation	15%
Final Paper	40%
Total:	100%

This class uses standard ABCDE grades. Final letter grades will be assigned as follows:

- A: 90% or higher
- B: 80 – 89%
- C: 70 – 79%
- D: 60 – 69%
- E: Below 60%

### **Absence and Class Participation Policy**

Please let me know if you will need to miss class. Participation is part of the final grade and will be assessed based on attending class most days and on active participation during class.

The UA's policy concerning Class Attendance, Participation, and Administrative Drops is available at: <http://catalog.arizona.edu/policy/class-attendance-participation-and-administrative-drop>

The UA policy regarding absences for any sincerely held religious belief, observance or practice will be accommodated where reasonable, <http://policy.arizona.edu/human-resources/religious-accommodation-policy>.

Absences pre-approved by the UA Dean of Students (or Dean Designee) will be honored. See: <https://deanofstudents.arizona.edu/absences>

### **Final Paper**

There will be no final exam. Instead, the final project will be a paper potentially suitable for publication in a scientific journal. This paper may be based on the student's own scientific research, or it can be a review paper summarizing a particular topic. The length should be at least ~2000 words, but is negotiable based on the student's target journal and topic. The paper will be

written and edited in stages throughout the course, and include revisions based on instructor and student peer review. The final paper is due on the last day of class.

**University Policies:**

All other university policies related to a syllabus are available at:  
<https://academicaffairs.arizona.edu/syllabus-policies>.

**Subject to Change Statement:**

Information contained in the course syllabus, other than the grade and absence policy, may be subject to change with advance notice, as deemed appropriate by the instructor.