
AST 410, Fall 2018
Scientific Communication
Syllabus

This undergraduate capstone course teaches effective communication of scientific topics and introduces best practices for written and oral presentation.

COURSE GOALS


Effective communication is essential for working in a scientific or technical field. In this course you will learn how to write for a technical audience; how to effectively visualize data; and how to give a clear, understandable talk. You will also learn best practices for writing a curriculum vitae and academic statement.

You will explore the scientific literature on a topic of your choice and critically analyze the scientific merit of key papers in that area.

INSTRUCTOR

PROFESSOR EDWARD BROWN

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 884-5620

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 <http://www.pa.msu.edu/~ebrown>

 <https://github.com/nworbde>

OFFICE HOURS: M 2:00–3:00; TTh 11:30–12:30; also by appointment.

CLASS TIME AND LOCATION

Wednesday 9:10–10:00 in 1300 BPS.

COURSE MATERIALS

RECOMMENDED

1. Pinker, S. 2014, *The Sense of Style* (Viking Penguin).

2. Tufte, E. R. 2006, *Beautiful Evidence* (Graphics Press).
3. Software that can produce high-quality graphics, e.g., `matplotlib` (shipped with *Anaconda Python*).
4. Presentation software, e.g., *Keynote*, *Powerpoint*, *Google Slides*, *Prezi*

SUPPLEMENTAL REFERENCES

1. Strunk, W. and White, E. B. 1999, *The Elements of Style* (Longman, 4th Ed.).
2. *The Astrophysical Journal* Guidelines on Manuscript Preparation
3. *Physical Review* Style and Notation Guide
4. *Merriam-Webster* online dictionary; see also *Merriam-Webster's Collegiate Dictionary*, 11th ed.
5. *The Chicago Manual of Style*, 17th ed.

COMPONENTS

The main product of the course is a final thesis of 15–20 pages in length. This thesis is due in the final class of your last semester in this course. In addition, you shall give a presentation (10–12 minutes in length) on your thesis topic in the second semester of the course. At the end of your first semester of the course, you shall submit an extended abstract of your proposed thesis and also give a brief (2–3 minute) presentation. We shall schedule presentations for both the abstract presentation and the thesis presentation in the latter half of the appropriate semester.

The remainder of the course will consist of short assignments, including the following.

Seminar review You shall visit two seminars or colloquia this semester and write a review (about 300–500 words) of each presentation.

Career development You will prepare either a curriculum vitae and an academic statement, such as would be used for graduate school, or a résumé and application cover letter.

Research summary You will give a short (one-slide) presentation on a paper of your choice.

There is no final exam.

GRADES

To receive a 3.0, all material must be written in a professional style, and must conform in language, mathematics, and graphics to the standards of *The Astrophysical Journal* or *The Physical Review*. In addition your thesis must, at a minimum, apply astrophysical concepts learned in the undergraduate courses to explain the motivation and execution of the selected paper(s).

To receive a 3.5, you must meet the above requirements; in addition your thesis must survey the selected papers and not only apply concepts to explain their motivation and execution, but also compare the papers and differentiate their motivation, scope, and findings.

To receive a 4.0, you must exceed the above requirements; your thesis must not only differentiate the motivation, scope, and execution of the selected papers, but also analyze them and critically appraise their context and scientific merit.

DISABILITY ACCOMMODATIONS

Students who require disability accommodations must bring their VISA forms to Prof. Brown during the first week of classes. If you require accommodations but have not yet registered as a student with a disability, please register with the MSU Resource Center for Persons with Disabilities at <https://www.rcpd.msu.edu/services/accommodations>.

WHEN THERE IS A CONFLICT

Disagreements and conflicts occur from time to time and are a fact of life; the first rule of managing conflict is to make sure that it is promptly addressed. I therefore propose a “24–48” rule if you are unhappy about any aspect of the course: please bring your complaint to my attention promptly, within 24 hours of the issue arising; in turn, I shall evaluate your complaint and respond within 48 hours.