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AST 410, Fall 2016  
Scientific Writing and Presentations

## Syllabus

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*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 anyone working in a scientific or technical field. In this course you will learn how to write for a technical audience; how to effectively visualize quantitative data; and how to give a clear, understandable talk on a scientific topic. You will explore the scientific literature on a topic of your choice and critically analyze the scientific merit of key papers in that area. Finally, you will learn best practices for writing a curriculum vitae and academic statement.

### INSTRUCTOR

PROFESSOR EDWARD BROWN

📍 BPS 3266

☎ 884-5620

✉ [browned@msu.edu](mailto:browned@msu.edu)

🏠 <http://www.pa.msu.edu/~ebrown>

🔄 <https://github.com/nworbde>

🐦 <http://twitter.com/nworbde>

OFFICE HOURS: TTh 11:30-12:30, T 2:00-3:00; or by appointment.

### CLASS TIME AND LOCATION

Wednesday at 9:10-10:00 in 1300 BPS.

## COURSE MATERIALS

### REQUIRED

1. Strunk, W. and White, E. B. 1999, *The Elements of Style* (Longman, 4th Ed.).
2. Pinker, S. 2014, *The Sense of Style* (Viking Penguin).
3. Tufte, E. R. 2006, *Beautiful Evidence* (Graphics Press).
4. An free account with [Authorea](#). Authorea is a collaborative online tool for scientific writing and publishing. MSU has purchased a group license for this course, which gives course members private articles. We will use Authorea to write and review class papers.
5. [Anaconda Python](#); we will use the `matplotlib` tools to make plots.
6. Presentation software, e.g., [Keynote](#), [Powerpoint](#), [Google Slides](#), [Prezi](#)

### SUPPLEMENTAL

1. *The Astrophysical Journal* [Guidelines on Manuscript Preparation](#)
2. *Physical Review* [Style and Notation Guide](#)
3. [www.dictionary.com](http://www.dictionary.com)
4. *Merriam-Webster's Collegiate Dictionary*, 11th ed.
5. *The Chicago Manual of Style*, 16th 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. We will schedule these presentations in the weeks before the end 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.

**Credentials and application** You will prepare a curriculum vitae and an academic statement, such as would be used for graduate school.

**Short presentation** 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 should bring their VISA forms to me 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; what is important is that they are swiftly and satisfactorily resolved. If you are unhappy about any aspect of the course, I propose that we follow a “24–48” rule: 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.