

# **Astronomy 401**

## **Scientific Writing for Astronomers**

### **Fall Semester 2013**

Course web page URL <http://go.illinois.edu/ASTR401>

#### **Professor**

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Office Hours: Wed. 1:00 pm – 2:00pm, or by appointment

#### **Text (Recommended)**

W. Strunk, Jr., and E.B. White, *The Elements of Style*, 4th ed. (Allyn & Bacon)

#### **Course Goals and Structure**

This course exists to help you develop an accurate, clear, logical, and efficient writing style appropriate to the contemporary scientific literature. You will be required to write a scientific paper 20–40 pages in length, suitably documented, in the style of a major astronomical research journal. The essential objectives of that paper will be (1) to motivate the reader, by identifying and explaining the context and significance of the subject at hand, (2) to elaborate the methods and assumptions applied in the scientific study of the subject at hand, and (3) to identify the principal conclusions of your study and their significance.

Course requirements will be met by one major paper of about 30 pages. This paper will be an exploration of a recent high-impact research article on a subject covered by ASTR 406. A list of articles (with links) is posted on the course website. The articles chosen are all in the “letter” format, meaning that they are brief (typically 4 journal pages) and are meant to be accessible to anyone with a background in galaxies and cosmology. In practice, you will find that the article you choose is really the “tip of the iceberg,” drawing on a large body of work (theory and observation). The paper *you* will write will “unpack” your selected article by: explaining the background theory and observations that motivated the article, describe the methods used to obtain the results, and to place the results in the larger context of galaxies and cosmology. Where possible you will derive or check the results presented in your article.

The format of your paper will be similar to that of articles in a major astronomical journal, such as the *Astrophysical Journal*, *Astronomy & Astrophysics*, or *Monthly Notices of the Royal Astronomical Society*. These papers begin with an Introduction giving appropriate background and outlining the presentation. Then the main body of the paper includes several sections and subsections presenting the information to be discussed in detail—the data, their analysis and interpretation, development of theoretical models and comparison

of the various results. It can be divided in various ways, depending on the material to be covered. The instructor will discuss the different options with the student at the appropriate time indicated on the schedule below. Figures and tables also play important roles in scientific papers, and the student will be expected to include them as appropriate. The paper should finish with Conclusions and discussion of Future Directions of the particular research being described.

Development of your paper will proceed through several stages of review as elaborated in the tentative course schedule below. As these reviews progress, draft manuscripts will be critiqued on content, grammar, syntax, style, effectiveness of expression, coverage of chosen topic, and clarity of presentation. Expressing critical thinking will be emphasized.

## Grading

The course grade will be based on your progress on the paper, and on the initial, revised, and final versions of the paper. Point assignments are as follows.

Assignment	Points
Analysis of Example Article	5
Outline	5
Abstract and References	5
Introduction and Working Drafts    4 weeks $\times$ 5	20
First Complete Version	35
Revised Version	20
Final Version	10
Total	100

## Academic Integrity and Plagiarism

The following are selected quotes from the campus policy regarding student academic integrity:

"The University has the responsibility for maintaining academic integrity so as to protect the quality of education and research on our campus and to protect those who depend upon our integrity. It is the responsibility of the student to refrain from infractions of academic integrity, from conduct that may lead to suspicion of such infractions, and from conduct that aids others in such infractions."

"Students have been given notice of this rule by virtue of its publication. Regardless of whether a student has actually read this rule, a student is charged with knowledge of it. Ignorance of a rule is never a defense." [emphasis added]

Plagiarism itself is defined as

Representing the words or ideas of another as one's own in any academic endeavor. This includes copying another student's paper or working with another person when both submit similar papers to satisfy an individual, not a group, assignment, without authorization."

Note that plagiarism can occur not only when direct quotation is made without attribution, but also when paraphrase and even borrowed facts are used without proper citation. Moreover, If you have even the slightest doubt about what constitutes plagiarism, please consult the instructor before turning in the assignment.

### **Schedule**

Sept 2 Select an article. Arrange time for meeting with instructor to discuss the topic.

Sept 9 Meet with the professor to discuss the choice of topics and options for the paper.

Sept 16 Present a short (1–2 paragraph) written abstract which summarizes the main topics and results which will appear in your paper, and a list of key references. This topic must be approved by the professor. A critical review of these by the instructor will be used as a guide for the student in developing the full Introduction.

Sept 23 Completion of an outline of the paper indicating major data and arguments which will be used, and how they will fit into the development of the major theme of the paper. The outline will be reviewed by the instructor and revisions made as necessary. Further changes may be warranted as the paper develops.

Sept 30 Completion of the Introduction (approximately 5 pages), presenting background and justification for the paper. Both substantive and grammatical improvements will be undertaken in consultation with the instructor during the following two weeks while the student is beginning subsequent sections of the paper.

Oct 7, 14, 21, 28 Each week, turn in a paper draft to instructor. Draft can be rough, and are to be in a pdf file. To receive full credit, each week at least 4 new pages (12 point font, single-spaced, 1.5-inch margins) must be added from previous week; include a brief note summarizing in 1-2 sentences what the new additions are. One week you may be excused from turning in an updated draft.

Oct 28 Completion of a first complete draft of the full paper, including all sections, the full list of references, final figures, etc.

Nov 11 Instructor returns first draft with comments.

Nov 18 On basis of instructor comments, revise paper and turn in revised draft.

Dec 2 Instructor returns comments on revised draft.

Dec 9 Submission of the final paper based on comments on revised draft.