

Course Writing Project

An extended writing project will form 25% of your course grade. This paper will require extensive library research. Legitimate research sources include scientific books and journals, as well as popular science magazines (like Discover, or Scientific American) though popular science articles should not be the only sources. Sources should be at a level appropriate for a university level, upper division GE science class.

Web sites are not legitimate sources unless there is an edited or peer-reviewed hard copy!! **Your grade will suffer if you cite web sites that do not vet information for accuracy!!!!!!**

Your writing project is intended to show that you are capable of researching a topic of interest, doing some independent learning on that topic, assimilating the information, and analyzing it in order to arrive at an original idea or opinion. If all you do is regurgitate a set of facts, you will get a low grade on the paper.

Audience:

The paper should be written as though you were addressing other members of this class, or people with similar background knowledge. Your goal is to provide new information in a coherent, understandable way. A good approach is to consider yourself to be a scientific consultant to a member of Congress. Pretend you are writing a report for a committee debating funding for NASA. Arguments without sound scientific background are not likely to be well received!

Length:

A target to shoot for is a length of 12-15 pages of double spaced 10-12 point text. Figures, tables and a list of references are not to be counted in the 12-15 page count, but you should include them to highlight your points.

Despite how long 12-15 pages may sound, you will find that it really is not that much to write. It is important, therefore, to focus your thoughts before setting out to write the project. Be concise and focus only on a small portion of the topic. You will find your arguments to be much more persuasive if you do not ramble about everything you can think of.

References:

References are essential. The best ones are original research articles, such as those that appear in periodicals like Science, Nature, The Astronomical Journal, The Astrophysical Journal, The Journal of Geophysical Research (Parts A and D), Planetary & Space Science, Solar System Research, The Monthly Notices Of The Royal Astronomical Society, Astronomy And Astrophysics, Solar Physics, Astrophysics And Space Science, Space Science Reviews.

Not all of these journals are available here at CSUS, but those that are not can most likely be found in the Physical Science Library at UC Davis, or through web links. The reading in these journals will likely be a bit "heavy", since the articles are written for experts in the field. You will be surprised, however, how much you can pick up though. Give it a try! Feel free to come see me if you would like something explained.

Other references, of more of a summary nature, are also useful. These can include articles in publications/periodicals like Annual Reviews Of Astronomy And Astrophysics, Sky & Telescope, Astronomy, Science News, Mercury and Scientific American. Search out these journals/publications at CSUS, UC Davis, the Web, or even your local library (for many, but not all, of those listed above).

Style:

There are certain rules that are the same in all papers, and these must be followed at all costs or your grade will suffer.

- * Rule number 1: Spelling must be correct.
- * Rule number 2: Overall sentence construction must make sense. Do not use partial sentences or sentences that have no end in sight.
- * Rule number 3: Grammar must be correct.

Any reference/citation style you are familiar with is fine for this paper, as long as you use it correctly. Below I give examples of how sources are referenced and cited in professional research journals in astronomy. What ever style you use, I must be able to look up each of your sources to verify them, given the information in your bibliography.

1. Articles in periodicals:

- Single author:

Janes, K. A. 1994, Astronomical Journal, 109, 1783.

This style references a paper by the author "Kenneth A. Janes" in the journal "Astronomical Journal". The paper appear in 1994, in volume 109, on page 1783.

- Two authors:

Janes, K. A. & Phelps, R. L. 1994, Astronomical Journal, 110, 1806.

This style would be used to reference a paper by the authors "Kenneth A. Janes and Randy L. Phelps" in the Astronomical Journal which appeared in 1994 in volume 110 on page 1806.

- Three or more authors:

Janes et al. 1996, Astrophysical Journal, 345, 444.

This style would be used to reference a paper by Kenneth A. Janes, *and all of his coauthors*, in the 1996 Astrophysical Journal, in volume 345 on page 444.

2. Complete Books:

- Author(s):
Moons & Planets 1998 (4th edition), William K. Hartmann, Wadsworth Publishing (Belmont, CA)
- Editor(s):
The New Solar System, 1990 (3rd edition), J. Beatty & A. Chaikin editors, Sky Publishing (Cambridge, MA)

Note that the rules for one, two or multiple authors/editors or books are the same as those for articles.

3. Articles in Books:

Phelps, R. L. 1993, in "CCDs in Astronomy", A. G. D. Phillips, editor, L. Davis Press (Schenectady, NY), p. 183

Note the style is similar to that for referencing complete books, with the addition of the author of the article (Phelps, R. L. in this case), the added "in" before the title of the book, and the page reference.

There are going to be circumstances where you may not be able to follow these rules exactly. Feel free to ask me if you have specific questions.

To cite an article in the text of your paper, you can do two things:

- 1) "According to Taylor & Einstein (2008), Jupiter will explode in about 10 years"
Here you are supplying specific information that comes only from the work written by two authors, Taylor and Einstein, which was published in 2008. If you cite a work, it must appear in your bibliography.
- 2) "Saturn is also going to explode, in about 100 years (Taylor et al. 1905).
Here you've got a work with more than two authors, so you refer to it by the last name of the first author, and et al. (which is a Latin abbreviation for "and others"), and the year of publication.

Either citation method is good, and you'll probably end up using them both at different times in your paper.

Grading:

Grading will be based on the scientific content of your writing project, the logic you use to argue your points, the style/presentation of the project, and the degree to which it is correct in terms of spelling/grammar/structure.

The specific grading breakdown will be as follows:

10% - Did the paper cover the required topic?

30% - Did the paper have sufficient scientific content, and was it accurate?

20% - Organization/Presentation

20% - Grammar sentence structure, spelling

10% - Number/quality/use of references

10% - Sufficient length/depth

100%

Due Dates:

To help you along the way, and make sure there are no surprises at the end of the semester, you will be turning in parts of your writing project during the semester, according to the following schedule:

September 12: Turn in a piece of paper letting me know which of the topics you have chosen.

September 30: Turn in a list of specific books and articles, complete with author name, publisher (or journal name) and copyright date. Since scientific knowledge is always improving, using newer sources is better than older ones. You need to submit to me at least 5 different sources at this time, though in your final project you can use as many more as you see fit.

October 28: Turn in a detailed outline of your project, including section titles, and a bibliography.

December 2: Turn in the final version of your project. If you turn it in late, a penalty of 5% per day late will be applied to the project grade, to a maximum penalty of 10%

Topics:

Choose a topic for your writing project from among the list below. You may choose a topic other than these, but you must get it cleared by me first.

- 1) The Hubble Space Telescope and our solar system: When we think of the Hubble, we often think of the beautiful images of gas clouds and galaxies. But Hubble has done a lot of exploration *of our own solar system*. Describe the work Hubble has done in our own back yard, and ***discuss how Hubble's unique abilities have made these discoveries possible.***
- 2) Both NASA and private companies are planning missions with the goal of eventually exploiting the natural resources in asteroids. Describe what useful resources there might be, and discuss the feasibility and practicality of the various plans. Argue a case for whether or not the idea is worth pursuing.
- 3) Green Mars. Some people have argued that humans ought to transform the planet Mars to make it more Earth-like, a process called terraforming. Argue either for or against such a proposal. Base your reasoning on cost, scientific data, ethical considerations etc....
- 4) Should the asteroid Ceres be considered a true planet? Dig up information on what makes a planet a planet, and compare Ceres to other planets. You must base your argument on actual data on planets, no matter which side of the debate you take.
- 5) The prospects for life on Saturn's moon Titan. Describe the recent discoveries about Saturn's moon Titan. What are the possibilities for life on Titan? Why do scientists think that way? How does Titan compare to Jupiter's 4 larger moons?
- 6) What is the chance of an asteroid hitting the Earth and wiping out human civilization? Or even wiping out all life of any kind on Earth. Is there anything we could do to prevent it?
- 7) How big is the Solar System? Research and review the various definitions for what the boundary of our Solar System is, and develop a detailed case for whichever boundary is the most scientifically justified.