

GEOS 294

The Solar System – 3 credits

Location: Room 233, Natural Sciences Building

Time: Tuesdays and Thursdays, 5:20 – 6:50 p.m.

Web site: <http://www.gi.alaska.edu/~rherrick/GEOS294>

Prerequisites: MATH 108 (Trigonometry) and ENGL 111X (Introduction to Academic Writing).

Instructor:

Dr. Robert Herrick

Geophysical Institute – Rm. 108I WRRB

University of Alaska Fairbanks

Fairbanks, AK 99775-7320

rherrick@gi.alaska.edu

Work: (907) 474-6445

Fax: (907) 474-7290

Home: (907) 455-4664

Office hours: Formally, 3:00 – 5:00 p.m. Monday and Wednesday. I am in my office most of the time from 10:00 – 5:00 during the week, but you might want to call and check that I am in before dropping by.

Course Description: This course is a geology-oriented survey of the Solar System. Students will gain an understanding of the fundamental processes that formed our Solar System and shaped the planetary bodies within it. Important themes include discussing how we have arrived at our current state of knowledge and the limitations imposed by the types of data we can collect for the other planets. As the semester progresses, the course evolves from a discussion of geologic processes to planet-specific studies.

Course Goals: There are two primary course goals. The first is to impart general knowledge about the solar system. The second, more important goal is to introduce the scientific way to approach problems and to communicate how scientific exploration is conducted. Our knowledge of the planets results almost entirely from manned and unmanned space exploration, so planetary science is a very young field where fundamental discoveries are still being made. Within a short period individuals with no geoscience background can be provided enough information to gain a solid understanding of current research topics.

Required text: The Planetary System, 3rd Edition, by David Morrison and Tobias Owen, Addison Wesley Publishing, 2003. There is a web site for the book at http://wps.aw.com/aw_morrison_planetsys_3/0,6095,446863-main,00.html. The web site has review questions, tutorials, etc., that are fairly useful.

Grading:

3 non-cumulative tests (including final)	23.3% each (70% total for tests)
Term paper	20%
Homework.....	10%

Term paper:

The term paper will be 8 - 12 pages of double - spaced 12 pt. text, 1” margins, not including title page, abstract, references, tables, or figures. Twenty points will be deducted for papers not

within this length range. The paper should discuss a topic in planetary science for which multiple points of view exist. The author should summarize existing knowledge of a topic and support a particular point of view.

Format:

- Title page - Must include your name and title of the paper
- Abstract
- Body of the paper. 8 - 12 pages
- References
- Figure Captions
- Tables
- Figures

Format should file *AGU (American Geophysical Union)* style guide for submitted manuscripts – Directions for how to prepare a paper can be found at http://www.agu.org/pubs/au_contrib_rev.html. Ignore the directions for index terms and supporting nonprint material. Please pay particular attention to the link for the Grammar and Style Guide and the Reference Style Guide. Term papers should be submitted in hardcopy, not electronic, form.

References should be peer-reviewed articles from relevant scientific journals with perhaps a few references to abstracts from presentations at scientific meetings. With few exceptions, **WEB PAGES ARE NOT REFERENCES**. At least five references must be peer-reviewed articles or books. The most common publications that have articles in planetary science are: *Nature*, *Science*, *Journal of Geophysical Research (Planets)*, *Icarus*, *Meteoritics and Planetary Science*, *Geology*, and *Geophysical Research Letters*. Two good places to look up articles are the NASA Astrophysics Data System (<http://adswww.harvard.edu/>) and the abstracts of a recent Lunar and Planetary Science Conference (<http://www.lpi.usra.edu/publications/abstracts.shtml>).

Twenty points off per day for late papers.

Sample topics (others may be selected):

- Resurfacing history of Venus
- Dating surfaces on Mars with small craters
- The dark area on Iapetus
- History of water on Mars
- Does Europa have an ocean?
- Formation of complex craters
- Association of asteroids and meteorites

GEOS 294 – Course Calendar

Week

1/24	Review of the Solar System	Chap. 1, 3
1/31	Formation of the Solar System Available Data	Chapter 17
2/7	Meteorites, Asteroids, and Comets	Chapters 4-6
2/14	Planetary Interiors Test 1 – Through planetary interiors (2/16)	Chapter 9.2
2/21	Impact Cratering	Chap 7.3 – 7.4
2/28	Impact Cratering (cont.) Volcanism and Tectonics	Chap 9.3 – 9.4
3/7	Volcanism and Tectonics (cont.) Erosion	
3/14	Spring break, no classes	
3/21	Earth	Chapter 9
3/28	Moon and Mercury	Chap. 7,8
4/4	Test 2 – through Moon and Mercury (4/4) Venus	Chapter 10
4/11	Venus (cont.) Mars	Chapter 11
4/18	Mars (cont.)	
4/25	Rings Outer Planet Satellites	Chapter 16 Chapter 15
5/2	Term Paper Due (5/2) Outer Planet Satellites (cont.)	

Test 3 during final exam period