

Caleb Fassett

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Class: Kendade 303, 7 to 9 PM, Tuesdays

Office: Kendade 213, MHC

Office Hours: Mon. 3-4 PM; Tue. 11 AM-12 PM,
or by appointment*

I. Introduction:

How do the planets work, and what are they made of? What physical processes are important on planets with different surface gravity or no atmosphere? How do we make remote measurements that help us answer these questions? In this course, we will explore the other planetary bodies in our Solar System, and learn about their physical, chemical, and geological properties and evolution.

II. Mount Holyoke Mission Statement

Mount Holyoke College reaffirms its commitment to educating a diverse residential community of women at the highest level of academic excellence and to fostering the alliance of liberal arts education with purposeful engagement in the world.

III. Astronomy Department Learning Goals:

The learning goals for the Mount Holyoke Astronomy Department are:

1. Understand fundamental concepts in astronomy such as gravity, the nature of light, the origin of the universe, and physical characteristics of matter.
2. Demonstrate skills for quantitative analyses, including the ability to form a hypothesis, graphically represent and interpret data, estimate error and understand sampling bias.
3. Critically evaluate representations of science in all types of media.
4. Demonstrate proficiency in fundamental concepts in each of the major areas of astronomy: cosmology, planetary science, galaxies, stellar structure, and the universe.
5. Show a working knowledge of a broad array of physical phenomena that are based upon fundamental concepts.
6. Gain familiarity with instrumentation, computational methods and software resources utilized by professional astronomers.
7. Understand the variety of career paths and opportunities that are open to students who have majored in astronomy.
8. Exhibit a proficiency in the methods of scientific inquiry in laboratory and/or research projects.
9. Demonstrate use of critical thinking skills in well-organized, logical and scientifically sound oral and written scientific reports.

* I am usually in my office and happy to meet with you. If you email first, though, I will set aside time and be less likely to be distracted!

III. Course Learning Goals:

The major goals of this course are:

1. Understand important physical, chemical, and geological processes in our Solar System (e.g., heat transfer, planetary materials, impact cratering, volcanism, tectonism);
2. To understand how we explore alien worlds and the types of measurements we can make remotely.
3. To more fully understand space and time, and how our Earth fits within the broader context of the Solar System.

Along with these specific course goals, I hope to help you practice clear and critical thinking, and effective spoken and written communication. The study of planets is an interdisciplinary science, with elements that come from astronomy, geology, chemistry, and physics. You will also work on understanding quantitative concepts, mathematical methods, and analytical thinking. These are an important element of being a person educated in a liberal arts tradition, since it is important to think about how you relate to the natural world.

IV. Expectations:

- Be prepared to independently explore, think, and reason.
- Come to class, participate actively in the course, and keep up with the work.
- Know the schedule. Visit the webpage to keep up-to-date with the course.
- Seek me out if you have any questions or problems, or want to talk.
- **Get help promptly if you need it.**

V. Readings/ Textbook/Materials

There is no required textbook for this class. (A challenge in planetary science is that textbooks go out of date very fast – which is good, since it means we are learning a lot!). Some useful background readings are from an *Introduction to Planetary Science*, by Faure and Mensing (2007).

All reading assignments for the course will be handed out as *pdf* files on the course website: <http://www.mtholyoke.edu/courses/cfasset/astr223/>. The password for the reading was provided on the first day. If this method of distribution will pose a hardship for you for some reason, please let me know at the beginning of the semester. You will be expected to have an understanding of the key concepts from the reading.

VI. Grading Structure and Assignments:

Short Response Questions	20%
Exercises / Reading Assignments	40%
Two Papers (Mid-Semester, Final)	15/25%

There will be frequent short response questions to be completed individually at the beginning of class. Perfection on these assessments is not expected (though it is always welcome)! I will throw out your lowest grade on these, but there will be no makeups of these responses.

VII. Policies:

Late Policy: Unexcused late exercises are marked down 10% per day; no credit will be given after exercises have been returned (usually at the next class).

Academic Honor: Whatever you turn in must be your own work in accordance with the Honor Code – in other words, every answer you turn in to me should reflect your own understanding. However, working together *on exercises* is encouraged. Proactively talk to me about any questions about this policy you might have, and familiarize yourself with the Honor Code.

Accommodations for Disabilities and Learning Differences: Students with disabilities or learning differences are welcomed in class. If you have a disability and would like to request accommodations, please visit AccessAbility Services, located in Wilder Hall B4. They will give you an accommodation letter, which you should discuss with me on an individual basis early in the semester.