Syllabus
Comparative Planetology
Tuesdays, 5:30-8:30

Instructor: Dr. Mary Urquhart
Office Hours: Tuesday, 4-5pm and by appointment
Office Phone: 972-883-2499
Email address: urquhart@utdallas.edu

Course Objectives:
The primary goals of this course are to:

- Introduce K-12 in-service teachers to the integrated science of comparative planetology, the idea of the Earth as a planet, and similarities and differences with other planetary bodies in the solar system.
- Demonstrate how cutting-edge science can be used to enhance the pre-college curriculum.
- Provide students with hands-on activities and demonstrations that can be used with their own pre-college students.
- Sharpen the critical thinking skills of participants.
- Increase students' awareness of the nature of scientific exploration, especially on topics that go beyond the stable core of scientific understanding.

The overarching goal is to provide teachers with the knowledge, tools, and skills necessary to bring interdisciplinary, cutting-edge science topics into their classrooms.

Planned Topics and Activities

1. Scale in the Solar System: Why it matters!
2. The Earth as a Planet, Part 1
    - Views from Earth-Observing Satellites
    - Earth Systems: Solid Earth, Atmosphere, Water, and Life
3. The Earth as a Planet, Part 2
    - Planetary processes (Intro. to LPI slide sets)
    - Educational activities abound: NASA, DLESE, GEMS
4. Impacts and the Moon
    - Worlds in Contrast: Earth and Moon
    - Moon as a record of late heavy bombardment
    - Making impact cratering
5. Planetary Origins: A Lunar Record to Star Birth
6. Stories in Small Bodies: Asteroids, Comets, and Meteroites
7. The Mysteries of Mercury
8. Venus: Earth's "Evil Twin"?
9. Mars: How Warm? How Wet? How Earth-like?
10. Giant Planets
11. Icy Worlds All Their Own
12. Little Objects Everywhere: Small Moons, Kuiper Belt, and the Oort Cloud
13. Presentations of Class Projects

Required Text: The New Solar System

Readings: Additional weekly readings will be handed out in class and/or posted on WebCT.

Grading Policy: Grades will be based on a combination of weekly short essay assignments, journal entries, the quality of class discussions, and at a final project or paper. Your final letter grade will be determined by your percentage (90% and above for an A, 80-89% for a B, etc.). Grades will not be curved; you are not in competition with your classmates for a good grade.

- **Class Participation** (10%): Much of the class will be done in the style of an educator workshop. You will be expected to participate in all discussions and activities to be an active learner. Your class participation grade will reflect your knowledge of the readings, attendance, and the quality of your interactions with the other students and the instructor.
- **Projects** (20%): Projects assigned throughout the semester to be done in or outside of class.
- **Reflective Journaling** (10%): You will be asked to write weekly journal entries based on your readings, class discussions, and activities.
- **Quiz Questions** (40%): Every class meeting, one or more thought questions will be asked of the class to probe each student's understanding of the topics discussed. Answers to the journal questions must be in your own words, and when mathematical, you must show your work. Questions may take home or given in class. All quizzes will be graded on a 4 point scale:

  4 point: Excellent. Clear thoughts and well substantiated arguments. Little or no corrections are necessary.

  3 points: Good. Minor problems with the answer.

  2 points: Fair. Requires at least one major correction or revision. Consider redoing the quiz.

  1 point: Poor. Serious flaws in the answer. Turning in a redo of the quiz is strongly recommended.

  0 points: Did not address the question asked**.** Please try again.
- **Final Project** (20%): Each student is required to select, and complete present a final project to the class. You may partner with a classmate with approval from the instructor. Examples of projects:

- A unit of 3-4 complete lesson plans related to the planets.
- A "proposal" for a new planetary space-based mission.
- A term paper *and* accompanying poster or PowerPoint presentation on a planetary science topic.
- A planetary science research project from archived or new data such as achived data from NASA missions or the new data from the Mars student imaging project.

Important: All assignments must be completed in a timely manner and with a quality of work that reflects the level of this course. Accepting late assignments is at the instructor's discretion. **You are encouraged to discuss class work with your classmates. However, all assignments submitted for credit must be the work of the students submitting the assignments. Plagiarized assignments will *not* be accepted for credit.** Weekly quizzes provide the best method of gauging an individual students understanding of the physics concepts covered in this course. A final exam may be required for students who have three or more weekly quiz grades of 50% or less. (The 50% cutoff does not include any additional points earned due to subsequent revisions.) The final exam grade will replace the quiz grades in the calculation of the final grade in the class.

Course and University of Texas at Dallas Academic Dishonesty Policy*: The distinction between your work and the creative work of another must be clear in any assignment you submit for credit. You will not receive credit for plagiarized lessons/thought questions/term papers or projects. (All students at UT Dallas, are expected to adhere to the University policies regarding academic dishonesty which are available online at* http://www.utdallas.edu/student/slife/dishonesty.html.)