

## Earth 110 - Exploration of the Solar System - Winter Quarter 2016

*Explore our solar system, learn about its origin with the accretion and differentiation of bodies resulting in inner rocky planets and outer gas giants with their myriad of diverse satellites. Discover the cataclysmic early history of the moon; find out about space missions and discoveries, the recent discovery of exoplanets, and the ongoing search for extra-terrestrial intelligence. Consider promising sites for life in our solar system and beyond.*

Course website: <http://lunar.earth.northwestern.edu/courses/110>

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**Textbook:** *The Cosmic Perspective: The Solar System*, J. Bennett, M. Donahue, N. Schneider, & M. Voit, Pearson, (paper), 2014, 7th edition; Norris and Beck Bookstores, also on Reserve, Main Library

Class meets: T, Th 12:30 - 1:50 PM F285 Tech; Discussion sections: T 2, 4PM F389 Tech

Quizzes: 6 weekly, in class; lowest of 6 dropped: 5 total

Assignments: passed out in class on Tuesdays, due following Tuesday

Movie review: your selection from list on class website;

write a description of the film, relating depiction to course theme of "Exploration".

First and Second Exams, both in class

WCAS Policy on Academic Integrity: <http://www.weinberg.northwestern.edu/handbook/integrity/>

### *Topics Covered and Dates*

(C# denotes chapter reading assignment)

Week #1 (C1,3,4)	Jan 5, 7	Introduction; Universe; Solar System
Week #2 (C7,8)	Jan 12, 14	Solar System Formation; Planetary Geology
Week #3 (C9)	Jan 19, 21	Terrestrial Bodies: Earth & Moon
Week #4 (C9)	Jan 26, 28	TB: Mercury, Mars & Venus; Missions to Planets
Week #5 (C10)	Feb 2, 4	Exam #1; Planetary Atmospheres
<b>Tuesday</b>	<b>Feb 2</b>	<b>FIRST EXAM — 25%</b>
Week #6 (C11,12)	Feb 9, 11	Jovian systems; The Rest: Asteroids, Comets, Dwarfs
Week #7 (C13)	Feb 16, 18	Exoplanets, "Rare Earth"
Week #8 (C14)	Feb 23, 25	Our Star; Life in the Universe, Solar System
Week #9 (C24)	Mar 1, 3	"SETI"; Exam #2
<b>Thursday</b>	<b>Mar 3</b>	<b>SECOND EXAM — 25%</b>
Week #10	March 8-12	WCAS Reading Period

### **Grading:**

5 Quizzes - 10%; Assignments - 30%; Movie Review 10%

Exam #1 - 25%; Exam #2 - 25%

Check Canvas for Quiz, Assignment and Extra Credit postings

## Course Goals and Objectives:

### Course Goals:

By the end of this course, students will:

- Understand the basic motions and forces that govern planetary bodies
- Reflect on how space exploration has impacted different aspects of daily life (past, present, and future)
- Seek out continued learning about space, exploration, and space exploration by reading, watching shows/movies, or going to museums.
- Develop the skill set to pursue questions regarding the solar system and space exploration

### Course Objectives:

1. Evaluate the importance of space exploration to society
2. Describe differences between planetary bodies
3. Explain how planets generate and lose heat
4. Summarize how the internal heat of planets affects geologic (surface) and atmospheric processes
5. Compare extrasolar planets - aka "exoplanets" - with those in our own solar system
6. Construct an argument, supported by material from this course, for or against future space exploration and the possibility of other life in the universe