Course Syllabus

Description

ASTR 121 is an introduction to our Solar System for non-science majors. If you're a science major, you'll be a tiny minority in this class!

Historically, astronomy was the first science, but it is also a very modern science. Our understanding of the contents, formation and evolution of the Solar System has exploded in recent decades, mainly due to numerous missions/probes by NASA and other space agencies to all of the eight planets and beyond. The study of the characteristics of the other planets has provided tremendous insight into the understanding of how our own planet (Earth) operates and changes under mankind's influence. The purpose of this course is to educate the student on the basic science behind our exploration of the Solar System so you may make informed choices as future/current voters on issues of our environment and the future of science in this country.

- The specific goals of this class are to understand
  1. the basic science that underlies astronomy (the forum is the solar system),
  2. the properties of the objects that make up our solar system,
  3. how the evolution of other planets has an impact on the choices we make to manage our own environment.

- The interplay between technology (telescopes, space observatories) and knowledge gained about the Universe is a key theme to the course.

- In addition, this course traces the history of solar system discoveries in order to explore how the scientific method works and how civilization has gained from the progress of science and technology. The interplay between technology (telescopes, robotic space probes) and knowledge gained about the Solar System is a key theme to the course.

The laws governing the Universe are formulated in the language of mathematics, but the course will not go beyond high-school level algebra. Astronomy is a very visual science, and we'll often rely on animations and computer simulations. The level of the class assumes no prior knowledge of science whatsoever, but it will require quantitative reasoning.

It will help you succeed in this course if you come to class with a desire to dig deeper into the causes of things you see around you. Words you'll be hearing a lot are: "why," "how" and "what if" - because curiosity is what makes scientists tick.

This is an overview of the concepts that will guide the course. We'll work our way from the inside out:
The course is structured into the following 10 modules:

1. Early Astronomy from Antiquity to Kepler
2. Newtonian Mechanics
3. Radiation and Spectra
4. Astronomical Instruments
5. Earth and Moon
6. Planetary Science, Earth and Mars
7. Cratered Worlds
8. Space probes to the Moon and inner planets
9. Exploring the outer Planets and their Moons
10. The Outer Reaches, and Origins of the Solar System

**Required materials**

You don't need a telescope.

The OpenStax textbook "Astronomy" is linked here:

https://openstax.org/details/books/astronomy

You'll need a calculator for some of the online assignments (it doesn't have to be a scientific calculator). If you don't have one, you can type most calculations directly into the search field of a modern browser such as Google Chrome. If you prefer a more traditional interface, here is a free online scientific calculator:
Administrative details

Instructor: Prof. Jens Noeckel (noeckel@uoregon.edu),

Office hour: I'll publish weekly posts on the Canvas Discussion board, and will be on the Canvas Chat page live between 12:30 and 1:30 pm every Wednesday. To contact me with issues that you don't want to post publicly, send me a message via email or from the Canvas Inbox. Don't use the discussion feature within Panopto's video player to contact me. The system doesn't notify me of new messages posted there.

Website: All course materials will be on Canvas

Lectures: Classes are delivered as video assignments with embedded quizzes on Canvas. The videos are hosted on Panopto, but you have to access them by following the link from the corresponding Canvas assignment. Otherwise your lecture quiz score won't be recorded in the Canvas grade book. Each lecture has to be watched by a deadline posted with the assignment.

If you can't finish watching the video in one session, Panopto lets you bookmark specific points in the video, and you can resume watching or revisit topics at any time. Each lecture video comes with a list of chapters that you can access by clicking at the bottom of the screen.

Grading

Grades for the course will be based on quizzes in the lectures and in separate assignments. There will be no midterms or final exam because I don't see an equitable and cheat-proof way of having such exams online. The relative weights will be as follows:

In-lecture quizzes: 10%

Reading quizzes: 50%

Homework quizzes: 40%

I will drop your lowest 3 reading quiz scores and your lowest quantitative quiz score in computing your final grade (missed quizzes count as zero scores).

You're allowed to work together or use external resources to answer any of the quiz questions.

The score for all quizzes is based on the number of correct answers. You don't get points for incorrect answers, but you don't get penalized for them either.

In-lecture quizzes will appear at certain times during the lecture video. The deadline for answering the lecture quizzes is posted under "Assignments". You have two attempts to answer each in-lecture question. This is because I will sometimes make you take a guess between two alternatives. So if you
get it wrong the first time, it will not hurt your score because you can then re-do the question and pick the other choice.

**Reading quizzes** go along with the reading assignments for each module. They are multiple choice. You have only one attempt to answer the reading quiz questions. This is intended to make you read carefully before answering the questions. The questions are designed to be conceptual and simple, provided that you have read the material.

**Quantitative quizzes (labelled as "Problem sets" to distinguish them from the other quizzes)** will be posted separately on Canvas with their own deadlines. You have two attempts to answer each question on a quantitative quiz.

The quantitative quizzes can be multiple choice or may require numerical calculations. This means you will need a calculator! The quantitative quizzes will also have a link to the Canvas Discussion board where you can ask questions about the assignment.

**Late policy for all quizzes:**

**Canvas will automatically deduct 20% per day for late submissions. I can override this on a case-by-case basis if you have a valid excuse.**

**Pass/fail grading option:** a passing grade requires the equivalent of a C grade on all course work (quizzes, homework, midterms, and final).

**Grading scale:** the nominal grading scale for this course is below. If the final class average is excessively low, I may apply a curve for a higher average final grade. However, you are guaranteed at least the grade listed below based on your final average; you are not competing with others in the class for your grade.

\[
\begin{align*}
\geq 97: & \text{ A+} \\
\geq 93: & \text{ A} \\
\geq 90: & \text{ A-} \\
\geq 87: & \text{ B+} \\
\geq 83: & \text{ B} \\
\geq 80: & \text{ B-} \\
\geq 77: & \text{ C+} \\
\geq 73: & \text{ C} \\
\geq 70: & \text{ C-} \\
\geq 67: & \text{ D+} \\
\geq 63: & \text{ D} \\
\geq 60: & \text{ D-} \\
< 60: & \text{ F}
\end{align*}
\]

Note that the total score listed in Canvas for the in-lecture quizzes is not always accurate: it doesn't show missing lecture quiz scores as zero points. That seems to be a bug in the system. If you have no missing lecture scores, then your Canvas total does give the correct score.

**Academic Honesty**

Students are expected to abide by university policies on academic honesty, avoiding plagiarism, fabrication, cheating, and academic misconduct. The Student Conduct Code ([https://dos.uoregon.edu/conduct](https://dos.uoregon.edu/conduct)) provides definitions of these terms and explanations of the university policy on the subject. Academic dishonesty will be dealt with severely, as it is disrespectful to your fellow students and your instructor, as well as being against both university regulations and state laws.