ASTR 202: Exploration of the Solar System
Syllabus - Spring 2016 Semester

Instructor: **Prof. David Alexander (202/206 Herman Brown Hall, x3633)**
Email: dalex@rice.edu
Class Website: **OwlSpace**
Lectures: **Tuesday and Thursday, 9:25am – 10:40am,** Classroom TBD
Office Hours: **Following each class and by email appointment**
Teaching Assistants: **TBD**

Course Objectives and Learning Outcomes

The course is designed to satisfy Group III distribution requirements. Students majoring (or intending to major) in astronomy/astrophysics should consider ASTR 350 (Introduction to Astrophysics - Stars).

The primary objectives of the course are to introduce students to some basic astronomical concepts and to apply these concepts to our own backyard, namely, the Solar System. The Solar System will be placed in context to the rest of the universe with a particular emphasis on modern observing and exploration techniques, astronomical discoveries, and mathematical problem-solving employing basic concepts of physics and chemistry. While we will touch on stars, galaxies and the Universe, we will concentrate on the Sun, Earth, other planets, and the minor Solar System bodies such as comets and asteroids.

The student learning outcomes of this course encompass a variety of knowledge and skills that apply scientific reasoning to an understanding of the solar system, the bodies of which it is comprised and the means by which we gather and interpret the information that lead to this understanding. In particular, the students will be able to

1. Demonstrate and understanding of the basic principles of science and scientific investigation.
2. Show how observations can inform our understanding of astronomical phenomena.
3. Apply an understanding of everyday physical behavior to the planets in the solar system.
4. Explain how electromagnetic radiation is used by astronomers to gain information about the properties of astronomical bodies.
5. Discuss how gravity governs the motion of the planets in the sky.
6. Relate the basic properties of matter to an understanding of astronomical observations.
7. Discuss the basic processes at work in planetary atmospheres and planetary geology.
8. Discuss the nature of our solar system in the context of newly discovered exoplanet systems.
9. Apply scientific reasoning to everyday situations.

Prerequisites

No scientific or mathematical background beyond high school physics and algebra is assumed. The homework problem sets will not require calculus, but will involve equations and making calculations. Remember that they are designed to reinforce what you learn, not to catch you out. Examples relevant to the homework problem sets will be worked through during class.

Course Textbook

The text for the course is:

The Cosmic Perspective: The Solar System with MasteringAstronomy (7th edition);
by Bennett, Donahue, Schneider and Voit; published by Addison-Wesley;
ISBN-10 0321841069;
ISBN-13 978-0321841063.

If you are also planning to take ASTR 201 then you may instead purchase:

The Cosmic Perspective with MasteringAstronomy (7th edition);
by Bennett, Donahue, Schneider and Voit; published by Addison-Wesley;
ISBN-10 0321839552;
ISBN-13 978-0321839558.

The first book contains only the material that we will cover in ASTR 202. The second book contains all of the material for ASTR 201 and ASTR 202. Both books come with access to the website MasteringAstronomy, which provides a large amount of supplementary course material that it is strongly recommended you make use of. If you have a used copy of either textbook then you can purchase access to the website separately at http://www.masteringastronomy.com. **Note that the 6th edition of both textbooks is also available. The 6th edition is suitable for this course and significantly less expensive.**

Class Website

All course materials including problem sets, links to relevant websites, supplementary material, and class updates and announcements will be posted on the ASTR 202 S16 OwlSpace page. It is the responsibility of the student to read the emails from the class website and to check OwlSpace regularly for the most recent information.

Special Needs

Any student with a documented disability needing academic adjustments or accommodations is requested to speak with me during the first two weeks of class. All discussions will remain confidential. Students with disabilities will need to also contact Disability Support Services in the Ley Student Center (http://dss.rice.edu).

Assessment

The Honor Code applies to all assessment tasks. You can review Rice's Honor Council documentation online at: http://honor.rice.edu/index.cfm.

Homework problem sets: There will be weekly problem sets with questions from the course text and other questions at the same level that will be based on the material covered during the previous week. A problem set will be posted on Owl Space each Tuesday and will be due in class (or immediately before class if submitted online) the following Tuesday. The problem sets will be take-home and open-book. You may (indeed, should) discuss general concepts with your classmates before attempting the questions, but your answers must be the result of your own understanding of the material and you should write up the solutions to each problem set by yourself.

Class Project – Astronomy Playlist: The class project is to design an Astronomy iTunes playlist complete with explanatory fly notes. The playlist should consist of 10 songs from whatever genre you like (I will even accept country music). Each song must have some identified conceptual link to astronomy. The bulk of the project is to write a cover note (~100 – 150 words in length) for each of the 10 songs. The cover note should explain where the connection is between the song (lyric or music) and some aspect of solar system astronomy. Each song will be worth 10 points. 2 points will be automatically deducted if the theme of the astronomy paragraph appears in the song title; e.g. using *Gravity* by John Mayer as the song for a discussion of gravity. Grading will be based on: **relevance** to solar system astronomy (50 points) and **understanding** of the relevant concept being described (50 points). This assignment will be due at the beginning of class on **Thursday 7th April 2016**.

Plagiarism will not be tolerated in either the homework or the project and the professor has no discretion about whether to report it. The procedure for dealing with cases of suspected plagiarism is manifestly unpleasant and stressful (for student and professor), and emphatically not worth the risk to your academic career and to your future. Your work should be clearly distinguishable from its sources and be a direct result of your own understanding of the material. For a guide to plagiarism and how to avoid it please consult the Honor Council's document concerning academic fraud: http://honor.rice.edu/bluebook.cfm?doc_id=10355.

Attendance and Participation

Students who attend class regularly will be at a significant advantage because material not included in the textbook or class presentations made available on Owl Space is often featured during class. Furthermore, the examples that will be worked through during class are directly applicable to the homework problem sets. You are expected to participate actively in class activities and to ask questions.

Attendance will be taken electronically in each class. You **must** be present to be registered as being in attendance. Attendance constitutes 4% of your final grade. If you have an unavoidable conflict (an illness, conference, or other excuse for missing a class) email the TA at least 24 hours in advance and you will be excused. Excused absences do not affect your attendance grade. You will be allowed to miss up to TWO classes with no penalty. Each additional day missed will result in a 1% deduction. So, 6 or more classes missed will result in an attendance grade of zero. Legitimate absences of which I receive **advanced** notice will not affect your attendance record. You will require access to the class website so please add a link to your phone if you have not done so already.

Attendance Grade	
100 pts (4%)	Two unexcused absences
75 pts (3%)	Three unexcused absences
50 pts (2%)	Four unexcused absences
25 pts (1%)	Five unexcused absences
0 pts (0%)	Six or more unexcused absences

Grades

Task	Weighting
Attendance	4%
14 problem sets	66%
Class Project	30%

The overall percentage grade will be calculated from the percentage grade awarded for each task, with the appropriate weighting. The letter grade will be determined from the overall percentage grade as follows:

Letter Grade	Overall Percentage Score
A+	100%
A	93% – 99.99%
A-	90% - 92.99%
B+	87% - 89.99%
B	83% – 86.99%
B-	80% - 82.99%
C+	77% - 79.99%
C	73% – 76.99%
C-	70% - 72.99%
D+	67% - 69.99%
D	63% – 66.99%
D-	60% - 62.99%
F	<60%

You do not need to have a scientific background to get a high grade. However, you will need to work hard and regularly to achieve a top grade. This includes attending class, completing all of the problem sets and talking to the professor as soon as possible when difficulties arise. Misunderstandings can often be cleared up quickly and easily, but if left too late they can adversely affect your grade.

Cellphones and Laptop Computers, etc.

Laptop computers, netbooks, iPads, etc., may be used for the purpose of note taking only. Other activities are likely to be extremely distracting for others sitting nearby. If non-course-based electronic-device use becomes a problem during the semester then an in-class ban will be implemented.

Observing Sessions

The Rice University Campus Observatory(RUCO) provides an excellent opportunity for hands-on stargazing (http://www.ruf.rice.edu/~ruco/observatory.html). Nighttime observing sessions will be scheduled during the semester. However, as with most Earth-based astronomical endeavors, we are at the mercy of the weather and the local 'seeing' conditions. This means that observing sessions may be organized and cancelled at unavoidably short notice. The best nights for practical astronomy are clear and cold, so you are advised to dress warmly.