

## **Course Syllabus for AST 309S: The Solar System**

### **Instructor**

Sally Dodson-Robinson

Office: RLM 17.218

Phone: 471-7774

Email: [sdr@astro.as.utexas.edu](mailto:sdr@astro.as.utexas.edu)

### **Course**

Meeting times: Monday, Wednesday, Friday 11:00 AM—12:00 PM

Location: WEL 3.502

Unique number: 49035

Website: <http://www.as.utexas.edu/astronomy/education/spring10/dodson-robinson/309s.html>

### **Teaching Assistants**

Rodolfo Santana, [santana@astro.as.utexas.edu](mailto:santana@astro.as.utexas.edu), 471-3466, RLM 16.318

Ajay Gopinath, [ajay.g@mail.utexas.edu](mailto:ajay.g@mail.utexas.edu), 232-7416, ACES 2NEo2B (map on website)

### **Office hours**

Dodson-Robinson:

Monday 1:00-2:00

Tuesday 10:00 AM-12:00 PM

Other times by appointment

Santana (tutoring help):

Tuesday 1:00-2:00

Wednesday 3:00-4:00

Friday 2:30-3:30

Gopinath (grades):

Monday 2:00-3:00

Tuesday 2:00-3:00

### **Homework help sessions**

Rodolfo Santana will conduct one homework help session per assignment in RLM 13.132, with the schedule to be determined.

### **Course description**

Astronomy 309S is designed to offer a broad overview of planetary science to non-science majors. We will study the orbits, formation, composition and evolution of the sun, planets, asteroids, Kuiper Belt objects, comets and moons. We will also learn about planets outside the solar system, over 400 of which have been discovered as of Fall 2009. The class material emphasizes the newest, most exciting discoveries in planetary science and highlights current research methods. Much of what we will cover has been discovered within the last five years.

The prerequisite is Astronomy 301, 302 or 303. Students are expected to be able to apply high-school algebra, including solving for unknown variables and exponents.

### **Materials required**

**Textbook:** “The Solar System: Sixth Edition” by Michael A. Seeds. ISBN-13 978-0-495-38787-9. The Co-op may have used copies available.

**Scientific calculator:** exponent and trigonometric functions. *Important:* please bring your calculator to class every day.

**Computer access:** For our exoplanet homework assignment, you will either need to work for 1-2 hours in the astronomy computer lab, or you will need to install a Java application on your own computer.

**Note-taking materials:** I do not use PowerPoint except to show pictures, nor do I post lecture notes online. My expectation is that students will take notes during lecture.

## **Grading**

**Homework assignments** count for **20%** of the course grade. To help us keep the homework papers organized and make sure you get full credit for your work, please make sure to put your name on every page and staple the pages of your assignment.

There will be **five quizzes** with the lowest quiz grade dropped. The **four remaining quizzes** together make up **50%** of the course grade.

**The cumulative final exam** on Friday, May 14 will be **20%** of the course grade.

**In-class assignments** will make up the final **10%** of your grade.

Grading scale used for final grades:

		A	100-94%	A-	93-90%
B+	89% - 87%	B	86-84%	B-	83-80%
C+	79% - 77%	C	76%-74%	C-	73-70%
D+	69-68%	D	67-66%	D-	65%
		F	Below 65%		

At the beginning of the semester, students with disabilities who need special accommodations should notify the instructor by presenting a letter prepared by the Service for Students with Disabilities (SSD) Office. The University of Texas provides upon request appropriate academic accommodations for qualified students with disabilities. To ensure that the most appropriate accommodations can be provided, students should contact the SSD Office at 471-6259 or 471-4641 TTY.

Please note that all work, including quizzes and tests, must be **neatly written and easily readable** in order to receive a grade.

## **Course schedule**

### **Unit 1: Introduction and solar system formation**

- Solar system inventory: names and definitions of planets, asteroids, moons, comets and Kuiper Belt Objects.
- Setting the scale: relative sizes of objects in the solar system, distances between them, distance to nearby stars
- Why we have planets: star formation and protostellar disks
- **Assignments due:** January 27, February 5
- **Quiz 1:** Monday, February 8

### **Unit 2: Terrestrial planets**

- Formation, composition and size
- Geological processes: plate tectonics, volcanism and the carbon cycle
- The cratering record and the Late Heavy Bombardment
- The moon-forming impact: ongoing research
- **Assignments due:** February 17 and 26
- **Quiz 2:** Monday, March 1

### **Unit 3: Giant Planets**

- Formation, composition and size: ongoing research
- Differences between gas giants (Jupiter and Saturn) and ice giants (Uranus and Neptune)
- Rotation, magnetic fields and storms
- Moons and rings
- **Assignments due:** March 10 and 26
- **Quiz 3:** Monday, March 29

### **Unit 4: Leftovers**

- The Kuiper Belt: Pluto, Eris, Quaoar and why there are now 8 planets
- Asteroids: sizes, orbits, encounters with Earth, mass extinctions
- The science of meteoritics: measuring the age of the solar system, possible evidence for life on Mars
- Comets: leftovers from giant planet formation
- **Assignments due:** April 5 and 14
- **Quiz 4:** Friday, April 16

### **Unit 5: Exoplanets**

- What we have discovered: hot Jupiters, planetary supergiants, Neptunes and super-Earths
- How to find planets
- The search for habitable worlds
- Life in the universe
- **Assignments due:** April 26, May 5
- **Quiz 5:** Friday, May 7

**Final Exam:** Friday, May 14, 9:00 AM—12:00 PM

### **Attendance and religious holidays**

The in-class assignments and activities count for 10% of your grade. For grading purposes, I will drop one in-class assignment. If you miss more than one in-class assignment, it will count as a zero unless the absence from class was excused. To obtain an excused absence, contact the instructor **before** the class.

It is the policy of The University of Texas at Austin that the student must notify each instructor at least fourteen days prior to the classes scheduled on dates he or she will be absent to observe a religious holy day. For religious holidays that fall within the first two weeks of the semester, the notice should be given on the first day of the semester. The student may not be penalized for these excused absences but the instructor may appropriately respond if the student fails to complete satisfactorily the missed assignment or examination within a reasonable time after the excused absence.

### **Make-up work**

Late homework assignments will be accepted for **75% credit until solution sets have been posted** to the course web site. After solution sets are posted, no credit will be given for late work.

In general, I will not give make-up quizzes. The only exceptions are religious holidays (see above) and **documented** illnesses. To receive a make-up quiz because of illness, you must (a) notify the instructor you cannot attend **before** the start of the quiz, and (b) provide a doctor's note with date, time and verification of illness.

### **Scholastic honesty**

Students who violate University rules on scholastic dishonesty are subject to disciplinary penalties, including the possibility of failure in the course and/or dismissal from the University. Standards for Academic Integrity are posted at [http://deanofstudents.utexas.edu/sjs/acint\\_student.php](http://deanofstudents.utexas.edu/sjs/acint_student.php) .

### **Laptops and cellphones**

I strongly discourage laptop use during class, as brightly lit screens are distracting to everyone sitting nearby. However, if you prefer to take notes on your laptop rather than by hand, you must sit in the back row. No cellphone use, including texting, is allowed during class.

### **E-mailing your instructor and TAs**

Please e-mail us from your **university email account** if you want us to receive your message. The astronomy department has aggressive spam filters that may block your yahoo, hotmail or aol email. Please treat email as professional correspondence and use proper punctuation and capitalization. We will try to respond to appropriately written emails within 48 business hours. For detailed instructions on how to email a professor, please see <http://mleddy.blogspot.com/2005/01/how-to-e-mail-professor.html> .