

ASTR 405 — Planetary Systems
Syllabus for Spring 2018
134 Astronomy Building — MWF 11:00-11:50

Teaching Staff

	Instructor	Teaching Assistant
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Office Hours	Tue 2-3 or by appt	Wed 10-11 or by appt

Class Schedule (subject to change)

Course Information

Credit: 3 credit hours.

Prerequisites: Credit in PHYS 212 (University Physics: E&M). Credit or concurrent registration in ASTR 210 (Introduction to Astrophysics) and PHYS 213 (Thermal Physics) is *strongly* recommended. Some prior knowledge of astronomy is assumed.

Course Web Page: Located on <https://learn.illinois.edu/> (College of LAS Moodle)

Course Goals

Astronomy 405 is an in-depth survey of the Solar System and exoplanets from an astronomical perspective. We will also cover our current understanding of star and planet formation. Topics include: solar system dynamics; planetary atmospheres, surfaces, and interiors; rings, moons, and interplanetary debris; detection and characterization of extrasolar planets; star and planet formation; searches for life in the solar system and beyond. ASTR 405 is intended for advanced undergraduates with an interest in astronomy and a strong background in physics; it is also suitable for beginning graduate students. The course is highly quantitative, and is intended to provide a flavor of where the current research frontiers in these subjects lie. Upon completion of this course, students should be ready to undertake graduate-level research and coursework in these subjects.

Textbooks

Recommended Texts (on reserve at Grainger Library):

- *Fundamental Planetary Science: Physics, Chemistry and Habitability* by J. J. Lissauer & I. de Pater

(2013). Publisher: Cambridge U. Press. ISBN: 978-0-521-61855-7.

[Textbook website](#)

This new textbook covers planetary science at an advanced undergraduate level. An e-book version is also available from the website above. Free access to the e-book is available through the University Library [at this URL](#).

- *An Introduction to Modern Astrophysics, 2nd Edition* by B. W. Carroll & D. A. Ostlie (2007). Publisher: Cambridge U. Press. ISBN: 978-1-108-42216-1.

[Textbook website](#)

This huge text provides a broad survey of astrophysics, although with relatively little emphasis on topics covered in this course. Still, it is an important reference book for all of the 400-level astronomy courses.

Grading

Component	Points
Homeworks (best 10 of 11)	400 (40 pts each)
Group Presentation	60
Clicker Score (best 33)	100
Midterm Hour Exams (2)	200
Final Exam	240
Total Points	1000

There will be at least 39 lectures for which clicker points will be recorded (starting at Lecture 2), and you must attend 33 of these to get full clicker points (unless otherwise announced). No makeups will be allowed for missed classes for any reason except for fully documented, prolonged illness. Each lecture has 3 course points allocated: 2 course points for responding to at least 75% of the questions and an additional 1 point for providing a correct response to at least one of the questions. The total clicker score will then be added to 1 to give a score out of 100.

The course point total will be converted to a percentage, with A's corresponding to 90-100%, B's corresponding to 80-89%, C's corresponding to 70-79%, and D's corresponding to 60-69%. Pluses and minuses will be used.

Assignments

Regular assignments are an important part of the course, helping to reinforce concepts covered in the lectures and textbook.

1. **Homework assignments** (accessed through the course web page). These will consist of about 4-5 problems each, and must be uploaded to the course website before the submission deadline on Wednesday. Handwritten solutions are acceptable, but should be legible after scanning for online submission. Occasionally exercises will need to be completed on a computer. Credit will only be given to well-explained answers, and all important steps in a calculation must be shown. If you are unsure of whether your assignment was properly submitted, please contact the TA.
2. **Late assignments.** Assignments are due by 10 P.M. on Wednesdays. We typically allow a grace period of 15 minutes after the deadline. Assignments received after the deadline but by 5 P.M. on Friday will

attract a fixed, 10 point penalty. For special circumstances the penalty may be waived at the instructor's discretion. After 5 P.M. Friday, further submissions are disabled and will NOT be accepted by any other means.

Rules of Etiquette

For the benefit of your fellow students and your instructor, you are expected to follow these basic rules of decorum.

- Show up for class on time. If you must be late on a regular basis, please inform the instructor.
- Silence your cell phone before class begins.
- Computing devices can only be used in class under special circumstances or with the instructor's permission. These can be a distraction to other students.
- Do not leave class early, and do not rustle papers or pack up bags in preparation for leaving before class time is up.
- Be attentive in class. Do not use headphones, read newspapers, or prop your feet up on other chairs or desks.
- Be respectful in your interactions with your fellow students and your teachers, whether in person or in cyberspace.

Class Policies

- **General:** This course will follow all policies in the *Student Code* (<http://studentcode.illinois.edu>).
- **Class Participation:** Regular attendance is important, and there will be frequent i-clicker questions and in-class exercises to test your knowledge and prepare for upcoming homeworks. If you miss too many classes your grade will begin to suffer. You are also encouraged to volunteer or ask questions in class and come to office hours; this is a good way to develop familiarity with the instructors.
- **Working With Others:** Discussing course material with your classmates is encouraged, but each student is expected to do his or her own work. You are allowed to work together on homework problems, but each student should write up an individual description of the solution. Computer code can be copied or adapted from class examples or online sources only with proper attribution. For the group presentation, it is important that each student prepare and present a distinct part of the presentation. If you are in any doubt about whether something is allowed or not, ask the instructor or TA.
- **Make-up exams** will be offered in well-justified circumstances, in accordance with sections 1-501, 1-502, and 3-201 of the *Student Code*. Advance notice is **required** for approved school events (e.g., athletic events), religious observances, and other planned absences. Sudden illness requires documentation from McKinley Health Center or the Emergency Dean. The Emergency Dean must be contacted in other cases of unforeseen circumstances (e.g., death in the family). The format of the make-up may differ from the standard exam. In all cases, the make-up will be scheduled *after* the main exam.
- **Special accommodations:** To insure that concerns are properly addressed from the beginning, students who require reasonable accommodations to participate in this class are asked to see the instructor as soon as possible. All accommodations will follow the procedures as stated in sections 1-107 and 1-110 of the *Student Code*.

- **Academic Integrity:** Any instance of academic dishonesty (including cheating and plagiarism) will result in a grade of 0 for that component and be documented in the student's academic file. This includes copying written material from the Internet without proper attribution. Please refer to sections 1-401 to 1-406 of the *Student Code*.
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