

CONTACT INFORMATION:

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SYNOPSIS:

The overarching objective of planetary science is to understand the formation and evolution of the many diverse bodies found in planetary systems, as well as the evolution of planetary systems as a whole. A407/A507 is a survey course that is designed to introduce upper-level undergraduates and beginning graduate students to a broad range of topics in planetary science. By necessity, planetary science is highly multidisciplinary, synthesizing knowledge and techniques from many fields, including astronomy, chemistry, geology, and physics. Students in various areas of study are anticipated to find the course to be interesting, fun, and useful.

WHEN AND WHERE:

January-April 2015, MWF, 10:00-11:00 hr, HEBB-12.

TEXT:

“Fundamental Planetary Science” by Lissauer and de Pater. This is a new book that is available through, e.g., Amazon. It will not be carried by the UBC Bookstore. Please purchase the book online as soon as possible to ensure that you have the book for the start of the course. Note that the text is also different from “Planetary Sciences” by de Pater and Lissauer.

OFFICE HOURS:

The tentative, regular office hours will be held at 11 a.m. on Wednesdays. A poll will be set up to determine the best day and time for office hours. If there is a better choice, we will use that time. The course Web site will be updated accordingly. Please make use of the regular office hours if you are able. If you have scheduling conflicts or require additional help, then email me to set up an appointment.

COURSEWORK AND GRADING:

Course grades will be determined through a combination of 9 homework assignments, questions, a class project, and two examinations.

- 40% – Homework. There will be 9 homework assignments. Marks will be based on correctness, method, and clarity of presentation. Group work is encouraged, but each person is responsible for handing in an independent write-up. Graduate students in this section will be given additional research-related materials with some of the homework assignments.
- 5% – Questions. You are required to submit at least one question per week addressing planetary science topics. Your questions may be based on, for example, class reading, relevant news items, and/or concepts in your homework. Questions can be submitted at any time from Monday after class until the following Monday before 9 a.m. Submissions should be entered in your Journal on Connect. These questions are very important, as they will allow me to tailor the class to better facilitate learning material. You can also take credit for a question by visiting me during office hours (or by appointment) during the given week. Credit will not

be given for programmatic questions. Please note that such questions are always appropriate; they just will not be counted toward fulfilling your weekly question obligation.

- 15% – Project. You will be responsible for writing an in-depth Web article on a topic relevant to planetary science. Your target audience will be university-level students, but not necessarily in your field of study. We will work in small and large teams throughout the semester to refine each article and to ensure that it is written at the appropriate level. The articles will eventually be posted to the Web and made world readable. Your anonymity will be maintained if desired. A separate handout detailing the project will be distributed shortly after the first week of class.
- 40% – Examinations. The course will include a midterm and a final examination. There will be review sessions before each exam. Questions will be taken from class discussions (in class and online), homework, the class project, and class reading.
- *The final exam schedule is set by the university and is unknown at this time. Until further notice, you need to plan to be available for the entire exam period, which is between 12 and 30 April (inclusive). You are required to take the exam on the scheduled date.*

ATTENDANCE AND DEADLINES:

You are professionals, and in this course, you will be treated as such. In return, I expect you to be on time for lectures and to meet class deadlines. Changes to deadlines and/or examinations will only be granted under exceptional circumstances, which will be evaluated on a case-by-case basis. While I do expect you to attend class regularly, no strict attendance policy is in place, except as noted below. You are responsible for ensuring that you obtain missed lecture notes and familiarize yourself with all course announcements. If you persistently miss class, then I will require a valid reason for the poor attendance, which will be evaluated on a case-by-case basis. Failure to attend class for an entire week without being granted an exception will result in zero points for the homework assignment corresponding to the missed week.

You should also have expectations of me. I will return your marked assignments as soon as practicable. I will hold regular office hours and be available for appointments (as noted above). I will do my best to make sure that assigned tasks are very clear. Every reasonable effort will be made to ensure that you know your standing in the class.

GENERAL COMMENTS:

Please keep in mind that I want to see you succeed in this course. I am not your adversary. Instead, I am a facilitator. My job is to promote learning of class material, but you are expected to take an active role in your learning.

CLASS SCHEDULE:

Here is the tentative class plan. While we will attempt to follow it closely, the schedule may require modifications throughout the term. Changes will be announced and posted online as soon as practicable.

Mon	Jan 5	Course overview and intro	Handout Homework 1 (HW1)
Wed	Jan 7	Inventories	Ch. 1, 7-7.2, 11-11.2, 12-12.1
Fri	Jan 9	Exoplanets and discovery techniques	Ch. 14
Mon	Jan 12	Dynamics 1, two and three-body problem	Ch. 2-2.2, collect HW1, handout HW2
Wed	Jan 14	Dynamics 2, perturbations, resonances, and stability	Ch. 2.3-2.6
Fri	Jan 16	Dynamics 3, tides and other forces	Ch. 2.7–
Mon	Jan 19	Basic thermo and intro to hydrostatics	Ch. 3-3.2, collect HW2, handout HW3
Wed	Jan 21	Virial and Lane-Emden equation	Ch. 3.3–
Fri	Jan 23	Atmospheres 1	Ch. 5-5.4
Mon	Jan 26	Radiation	Ch. 4, collect HW3, handout HW4
Wed	Jan 28	Atmospheres 2	Ch. 5.5–
Fri	Jan 30	Interiors	Ch. 6-6.2
Mon	Feb 2	Gravitational moments	Reread ch. 2.5 and 2.6, collect HW4, handout HW5
Wed	Feb 4	Surface processes 1	Ch. 6.3
Fri	Feb 6	Surface processes 2 and cratering	Ch. 6.4
Mon	Feb 9	FAMILY DAY	NO CLASS
Wed	Feb 11	Review	Collect HW5
Fri	Feb 14	Midterm	
Mon	Feb 16	BREAK	NO CLASS
Wed	Feb 18	BREAK	NO CLASS
Fri	Feb 20	BREAK	NO CLASS
Mon	Feb 23	Jupiter and Saturn	Ch. 8-8.2, 10.2, 10.3, handout HW6
Wed	Feb 25	Uranus and Neptune	Ch. 8.3–, 10.4, 10.5
Fri	Feb 27	Venus and Mars	Ch. 9
Mon	Mar 2	Earth and Moon	Ch. 9, collect HW6, handout HW7
Wed	Mar 4	Exoplanet Properties	Review ch. 14
Fri	Mar 6	Planetary satellites	Review ch. 10, 2.7
Mon	Mar 9	Presentations 1	
Wed	Mar 11	Presentations 2	
Fri	Mar 13	Asteroids and comets 1	Ch. 12
Mon	Mar 16	Asteroids and comets 2	Ch. 12, review ch. 2.8, collect HW7, handout HW8
Wed	Mar 18	Debris systems	
Fri	Mar 20	Planetary rings	Ch. 13
Mon	Mar 23	Meteorites	Ch. 11, collect HW8, handout HW9
Wed	Mar 25	Topics in Solar System formation 1	Ch. 15
Fri	Mar 27	Topics in Solar System formation 2	Ch. 15
Mon	Mar 30	Topics in life 1	Ch. 16, collect HW9
Wed	Apr 1	Topics in life 2	Ch. 16
Fri	Apr 3	UNIVERSITY CLOSED	NO CLASS
Mon	Apr 6	UNIVERSITY CLOSED	NO CLASS
Wed	Apr 8	Review	
Fri	Apr 10	Review	LAST DAY