PLANETARY SCIENCES AND ASTROBIOLOGY (ASTR 497 / ESS 490)

Instructor:	David Catling	Office (Phone): E-mail: Office Hours:	JHN 325 (206-543-8653) dcatling@u.washington.edu Please make an appt. via e-mail
Lectures:	M, W 9am-10.20 pm	Johnson Hall, Rm 117	
Important Dates: * <u>Midterm Exam</u> : * <u>Final Exam</u> :		Weds, Feb 25, 900-1020 Weds, March 18, 830-1020, JHN 117	

Recommended Textbooks: There is no required book due to extensive lecture notes and lack of a wholly suitable textbook.

A recommended textbook with suitable background reading is: Lissauer & De Pater (2013) *Fundamentals Planetary Science*, Cambridge Univ. Press.

Suggested supplementary reading also includes: (1) Eales (2009) *Planets and Planetary Systems*, Wiley. (2) chapters posted online from Catling (2013) *Astrobiology: A Very Short Introduction*, CUP.

A lengthier tome that is useful, though getting dated is: (3) Sullivan & Baross (2007) *Planets and Life*, CUP.

Suggested book readings are coded as follows: LD = Lissauer & De Pater, E = Eales, C = Catling, SB: Sullivan & Baross. Other readings will be posted online in due course.

Syllabus & Schedule:

The schedule reflects approximate timing only. If we need more time on a particular topic and less on others then we will fall behind or get ahead as needed.

Week	Major Topics	Book/Text Chapter(s)	
I.	Intro to Life on Earth I: From the Biosphere to Cells	C: Ch. 5	
II.	Intro to Life on Earth II: From Cells to their Molecules and Atoms,	LD: Ch.16	
	What is life?		
	The Origin of the Solar System and Earth	LD: Ch.15. E: Ch.6, 8	
III	Planetary Differentiation; Origin of Life		
IV.	Origin of Life and History on Earth	C: Ch. 4	
	Overview of Planetary Climates and Atmospheres	LD: Ch. 5	
V.	Life and Atmospheres		
	Planetary Atmospheric Evolution		
VI.	Overview of Planetary Surfaces		
	Mars: Surface and Geology	E: Ch. 3, C: Ch. 6	
VII.	Mars: Atmosphere and Climate		
VIII	Life on Mars	SB: Ch. 18, C: Ch. 6	
	Mid-term		

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IX.	Venus: Surface, Geology, Atmosphere	LD: 9.3
	Europa & Titan	SB: Ch. 19, LD:
		10.3.1
Х.	Enceladus; Triton, Pluto	LD: 10.3.3,
	Exoplanets and Habitability	E: Ch. 9, C: Ch. 7
XI.	FINALS WEEK	

Grade Components:

Final Exam (35%), Midterm quiz (20%), Homework (30%) A <u>short</u> paper on an astrobiology topic of your choice (15%). Details on format to be given later.

Prerequisites:

As stated on the Instructor Class Description (http://www.washington.edu/students/icd/S/ess/490dcatling.html or http://www.washington.edu/students/icd/S/astro/497dcatling.html): "we use calculus in aspects of geophysics/astronomy to understand planetary evolution". Consequently, competence in basic calculus (differentiation and integration) is assumed.

What you are required to do:

You must do four homework assignments (problem questions) + midterm exam + final exam. Readings are recommended and would help you gain depth to your knowledge and understanding.

What you will learn:

How planetary surfaces, interiors, and atmospheres have evolved and what makes a planet habitable from the viewpoint of modern physics, chemistry, geology and biology.

Other info

The College requires the following statement on each syllabus:

Plagiarism, cheating, and other misconduct are serious violations of the student conduct code. We expect that you will know and follow the UW's policies on cheating and plagiarism. Any suspected cases of academic misconduct will be handled according to UW regulations. More information, including definitions and examples, can be found in the Faculty Resource for Grading and the Student Conduct Code (WAC 478-120). See:

http://depts.washington.edu/grading/pdf/AcademicResponsibility.pdf

Illness/Make-up Exams/Late Work: Make-up exams will not be given and late work not accepted. Exceptions are absence through a valid unavoidable cause (bad illness, serious accident, or death or serious illness in the immediate family), which allow grade components to be adjusted. Proof should be provided: a doctor's note, an accident report, or similar documentation including a contact name and telephone number. If you cannot prove that the cause for your absence was unavoidable, you may receive zero for an exam or homework.