Planetary Geology and Geophysics
Geo371C/391
Spring Semester, 2012
Jack Holt (jack@ig.utexas.edu)
Office hours: JGB 1.204C (Paleomag Lab) Tues. 2-4pm, or by appointment at UTIG.
Class time/place: Tues-Thurs 9:30-11:00am, EPS 4.104

Primary text:

Introduction to Planetary Science – The Geological Perspective, G. Faure, T. M. Mensing, Springer-Verlag, 2007.

Supplementary texts:

Planetary Sciences, I. de Pater and J. J. Lissauer, Cambridge, Second Edition, 2010.

Planetary Surface Processes, H. J. Melosh, Cambridge, 2011.

Overview: We will tour the solar system, starting with our own planet and its moon, to study variations in composition, structure, geologic history and, above all, the processes that have dominated their surface evolution. We will include discussion of remote sensing methods, missions, data sets, and the outstanding questions that are being addressed.

Format: Rather than being lecture-dominated, this class will include a combination of presentation and discussion, with shared participation and responsibilities. In general, we will first hold a professor-led discussion/presentation of the new topic (~30-45 min), then a student-led discussion/presentation of a key, relevant paper from the scientific literature (~30 min), and a student-led highlight of one or more planetary missions (~15-30 min).

Exercises will be assigned periodically to complement the in-class discussions and readings. A research project will be an important part of the course. Two presentations will be given for the research project, a brief one (~15 min) describing the concept and initial results, and a final one (~30 min) at the end of the course.

Grading:
Exercises: 15%
Paper reviews: 15%
Overall in-class participation: 20%
Project: 50% (Breakdown: final presentation 25%, writeup 75%)

The written projects will be due on May 4th, the last day of classes.

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Date			**Topic**	**Readings**	**Guest**	**Notes**	**Mission Spotlight**
Jan	17	TU	Intro, Planning, Overview				
	19	TH	Earth - formation, composition, processes	Ch. 3,6			
	24	TU	Earth/Moon system - formation, mechanics, geology	Ch. 9			GRACE
	26	TH	Moon - composition, water	Ch. 9	Jamie Barnes		LRO
	31	TU	Impact cratering - Moon, Earth	Ch. 8	Sean Gulick		GRAIL
Feb	2	TH	Sun and solar system formation	Ch. 4,5			
	7	TU	Planetary seismology - Apollo, future concepts		Yosio Nakamura	JWH out	Apollo
	9	TH	Small bodies and asteroids	Ch. 13	Britney Schmidt		Dawn
	14	TU	Comets	Ch. 22	Anita Cochran		(Anita's proposal)
	16	TH	Mercury	Ch. 10			Messenger
	21	TU	Venus - Structure, volcanism	Ch. 11	Duncan Young		Venera, Magellan
	23	TH	Venus - Atmosphere, cratering	Ch. 11			Venus Express
	28	TU	Mars - Geol. History,cratering	Ch. 12			Mariner, Viking
Mar	1	TH	Mars - Volcanism, Tectonics	Ch. 12			MGS
	6	TU	Mars - Fluvial and Eolian	Ch. 12			MRO
	8	TH	Mars - Ice and Climate	Ch. 12			Mars Express
	13	*TU*	*SPRING BREAK*			*no classes*	
	15	*TH*	*SPRING BREAK*			*no classes*	
	20	*TU*	*LPSC*			*LPSC trip?*	
	22	*TH*	*LPSC*			*LPSC trip?*	
	27	TU	Jupiter	Ch. 14			Voyager
	29	TH	Galilean Satellites	Ch. 15	Britney Schmidt		Galileo
Apr	3	TU	Saturn, rings and satellites	Ch. 16			Cassini
	5	TH	Titan	Ch. 17			Huygens
	10	TU	Uranus and Neptune	Ch. 18,19			
	12	TH	Pluto, Charon, Icy Outliers	Ch. 20, 21			New Horizons
	17	TU	Exoplanets	Ch. 24	Bill?		Kepler
	19	TH	TBD			JWH out	
	24	TU	TBD			JWH out	MSL
	26	TH	Student presentations - final projects				
May	1	TU	Student presentations - final projects				
	3	TH	Student presentations - final projects				