

**Morehead State University**  
College of Science  
Department of Earth & Space Sciences

**ESS 303 - Planetary Geology**  
Spring 2016

MWF

**Instructor:** Dr. Eric Jerde

**Office:** Space Science Center 212-A

**Office Hours:** M – F 2 – 4 pm

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**Text:** Planetary Sciences: Imke DePater, Jack Lissauer, 2<sup>nd</sup> Edition; Cambridge

**Course Description:** A study of the processes affecting planetary origins and evolution, with an emphasis on processes uncommon on earth (impacts, geology of icy bodies, planetary rings, etc.), particularly in the outer regions of the solar system. The processes of planetary exploration and the various methods of data gathering from interplanetary probes will be examined.

**Grading:** The final grade will be based on the total points earned from the following:

Three Quizzes on the reading (90 pts) and a final (75 pts), for a total of 165 pts,  
Lab exercises (Problem Sets) worth a total of 180 pts, == **TOTAL: 345 pts**

**Grades:** Grading is based on the following:

A = 87-100%; B = 73-85%; C = 60-73%; D = 51-59%; E < 50%

Blackboard will be used as an assist to the course. Exercises will be posted there, as will the scores for all assignments. At the end of the semester, the letter grade will be posted in Blackboard as well.

• **Absences: I DO NOT UTILIZE “EXCUSES” FOR ABSENCES.** “Official” excuses do not relieve you of responsibility for being in class, they only grant you the ability to make up missed classwork, something that should not be a factor unless you are away for many class periods.

• **Rescheduling of exams:** No rescheduling of exams unless approved by me in advance.

**Quizzes:** Quizzes (including the Final) will have two components, and in-class portion that assesses understanding of concepts, and a take-home portion to assess the ability to put the concepts to use.

**Exercises:** Exercises will be practical problem solving related to the lecture material. These “labs” will consist of more detailed calculations related to the topic under discussion. These may

be worked on together, but I expect that each person will do his/her utmost to understand the material, as it may appear again on exams. With regards to the scoring of problem sets, neatness **WILL** count. In order to get full credit, I must easily be able to follow reasoning and work.

**Special Needs:** In compliance with the ADA, all students with a documented disability are entitled to reasonable accommodations and services to support their academic success and safety. Though a request for services may be made at any time, services are best applied when they are requested at or before the start of the semester. To receive accommodations and services the student should immediately contact the Disability Services Coordinator in the Office of Academic and Career Services, 204-E ADUC, 606-783-5188, [www.moreheadstate.edu/acs/](http://www.moreheadstate.edu/acs/)

**Campus Safety Statement:** Emergency response information will be discussed in class. Students should familiarize themselves with the nearest exit routes in the event evacuation becomes necessary. You should notify your instructor at the beginning of the semester if you have special needs or will require assistance during an emergency evacuation. Students should familiarize themselves with emergency response protocols at <http://www.moreheadstate.edu/emergency>

**Academic honesty:** Cheating, fabrication, plagiarism or helping others to commit these acts will not be tolerated. Academic dishonesty will result in severe disciplinary action including, but not limited to, failure of the student assessment item or course, and/or dismissal from MSU. If you are not sure what constitutes academic dishonesty, read The Eagle: Student Handbook or ask your instructor. The policy is located at <http://www.moreheadstate.edu/units/studentlife/handbook/academicdishonesty.html>. For example: copying information from the Internet is plagiarism if appropriate credit is not given.

**Objectives:** Once the course is completed, the student will be expected to:

1. apply geological principles to exotic geological systems;
2. recognize and understand the significance of the different regions and various bodies in the solar system;
3. develop reasoning skills necessary to approach problems with complex solutions;
4. integrate remotely-sensed data with theoretical models and Earth-based experiments to assess possible processes operating elsewhere in the solar system;
5. synthesize information from several disciplines (i.e., geology, physics, chemistry, astronomy) to gain a wider comprehension of various topics in planetary science

# SYLLABUS

<b>Week</b>	<b>Topic</b>	<b>Chapter</b>
<b>1</b> Jan 19	Intro – Outline of Solar System, Terminology Nucleosynthesis – Origin of Elements	13
<b>2</b> Jan 25	Origin of the Solar System Processes: Accretion, Impacts <b>ST, EX</b>	13
<b>3</b> Feb 1	Meteorites – Evidence from the Beginning Outline of Cosmochemistry	8
<b>4</b> Feb 8	Orbital Dynamics – Travel in the Solar System <b>EX, Q</b>	2
<b>5</b> Feb 15	Planetary Surfaces – Processes, Ages Earth – Moon <b>EX</b>	5
<b>6</b> Feb 22	Planetary Surfaces (Cont.) Mercury, Venus, Mars <b>ST</b>	5
<b>7</b> Feb 29	Planetary Interiors – Principles, Processes Earth - Moon	6
<b>8</b> Mar 7	Planetary Interiors – Principles, Processes Mercury, Venus, Mars <b>EX</b>	6
<b>9</b> Mar 14	Satellite Surfaces and Interiors Galilean Quad; <b>Q</b>	6
<b>Mar 21</b>	<b>Spring Break – No Class!!</b>	
<b>10</b> Mar 28	Satellite Surfaces and Interiors Saturn: Titan, Enceladus, Iapetus, et al. <b>ST</b>	6
<b>11</b> Apr 4	Planetary Atmospheres – Principles, Processes Earth, Venus, Mars <b>EX</b>	4
<b>12</b> Apr 11	Planetary Atmospheres – Outer Planets Jupiter, Saturn	4
<b>13</b> Apr 18	Planetary Atmospheres – Outer Outer Planets Uranus, Neptune; <b>Q, ST</b>	4
<b>14</b> Apr 25	Minor Objects – Asteroids, Kuiper Belt, Comets Pluto <b>EX</b>	9, 10
<b>15</b> May 2	Future of the Solar System Exoplanets, Search for Life <b>ST</b>	12, 2
<b>FINAL EXAM – Mon., May 9, 2016, 10:15 am</b>		

**ST** – Star Theater class

**EX** – Exercise

**Q** - Quiz