

## Physical Geology: GEOS 115 SYLLABUS: Fall 2011

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### Description and Objectives

**Note: You must be enrolled in a section of the Physical Geology Lab to complete this course**

This course will introduce students to the fundamentals of physical geology. Students will explore aspects of Earth systems related to Earth materials and processes, as well as Earth history. The lecture is closely tied to the lab, and the lab will give students “hands-on” experience with materials and concepts introduced during lectures. The course is designed for students with little or no background in geology or the other sciences. Students will gain an appreciation for the complexities of Earth systems, and most will begin to see the relevance of a fundamental understanding of geology to their daily lives.

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### Course Information

**Instructor:** Dr. Karl W. Leonard

**Office:** KH 204

**Phone:** (218) 477-2682

**e-mail:** [leonardk@mnstate.edu](mailto:leonardk@mnstate.edu)

**url:** <http://www.mnstate.edu/leonard>

**office hours:** M, W 10:30- 11:30 & 1:30 – 2:30, T, Th 9:30 – 11:30, F 1:30 – 3:30, or whenever I’m in my office

**text:** S. Marshak, Earth: Portrait of a Planet; W. W. Norton & Company, 3<sup>rd</sup> ed.

**lab text:** R. M. Busch, ed., Laboratory Manual in Physical Geology, 9<sup>th</sup> ed.

**Class web page** can be found on: <http://www.mnstate.edu/leonard>

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### Evaluation/Grading

The total grade is calculated from a 70% contribution from lecture and 30% from lab. See the laboratory schedule for the details of that part of the grade. The lecture grade will be determined from:

**Exams (50%):** There will be 2 lecture exams, each worth 15% of the total grade, and a comprehensive final exam worth 20% of the total grade

**Web and in-class exercises (15%):** 4-7 web exercises and 3-7 in-class exercises will make up 15% of the total grade.

**daily quizzes (5%):** daily quizzes will make up 5% of the total grade.

**Lab exercises (30%):** 12 exercises and 2 field trips; Graded Lab Exercises = 25%, Field Trip Reports = 5% of total grade

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**Grading Scale:** A > 92; A- 90-92; B+ 86-89; B 83-85; B- 80-82; C+ 76-79; C 73-75; C- 70-72; D+ 66-69; D 63-65; D- 60-62; F < 60

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### Conceptual Framework

This course helps students achieve the conceptual framework of the educational unit.

### Standards of Effective Practice

This course complies with the standards of effective academic practice which can be found at:

[http://cfl.state.mn.us/teachbrd/8710\\_2000.html](http://cfl.state.mn.us/teachbrd/8710_2000.html), and INTASC Standards: <http://www.ccsso.org/intasc.html>

### Instructional Strategies:

This course will be presented in a short-lecture format mixed with small and large group activities and discussions.

### Course Requirements

There are primary components of this class. 1) Participation includes attendance and daily questions, work in discussion groups, lab exercises, and reports 2) Completion of lab reports.

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### Policies

**Attendance:** Students are expected to attend all class meetings.

**Special Accommodations:** Students with disabilities who believe they may need an accommodation in this class are encouraged to contact Greg Toutges, Coordinator of Disability Services at 477-5859 (Voice) or 1-800-627-3529 (MRS/TTY), CMU 114 as soon as possible to ensure that accommodations are implemented in a timely fashion.

**Academic Honesty:** (See MSUM Student Absence Policy, Student Handbook:

<http://www.mnstate.edu/sthandbook/> (under bookmark Student Policy Info).

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## Dragon Core and LASC

This course qualifies as a lab based course 4L in Category 4 of the Dragon Core and 3L in Area 3 of LASC. DC 4 is as follows:

### DC 4: NATURAL SCIENCES

Goal: To improve students' understanding of natural science principles and of the methods of scientific inquiry. To instill an appreciation of the ongoing production and refinement of knowledge that is intrinsic to the scientific method. By studying the problems that engage scientists, students will comprehend the importance of science in past and current issues that societies confront. Students should be exposed to the contributions of multiple scientific disciplines.

Student Competencies: MSUM students will be able to

- Demonstrate an understanding of the scientific method and of the relationship between hypotheses and theories.
- Recognize and define problems and formulate and test hypotheses using data collected by observation or experiment. One project must develop, in greater depth, students' laboratory or field experience in the collection of data, its quantitative and graphical analysis, its interpretation, its reporting, and an appreciation of its sources of error and uncertainty.
- Exhibit knowledge of the development and contributions of major scientific theories.
- Demonstrate knowledge of the concepts, principles, problems, and perspectives of one or more specific scientific disciplines.
- Consider societal issues from natural science perspectives, making informed judgments by assessing and evaluating scientific information.

### Lecture Schedule (Tentative)

Week	Topic	Reading
1 Aug. 22	<b>Dynamic Earth</b> M – Logistics/Introduction W – Science and Geology F - Origins and Structure of Earth	Prelude – What is Geology Scientific Method p. 7 Ch. 1 & 2
2 Aug. 29	M – Continental Drift W – Plate Tectonics I F – Plate Tectonics II	Interlude A & Ch. 3 Ch. 4 Ch. 4
3 Sept. 5	<b>Earth Materials</b> M - <b>Labor Day – No Class</b> W – What is a Mineral F - Mineral Properties	Ch. 5
4 Sept. 12	M- Mineral Types & Uses W- Rocks and the Rock Cycle F - Magma & Igneous Rocks	Interludes B & C Ch. 6
5 Sept. 19	M- Magma & Igneous Rocks W- Sediments & Sedimentary Rocks F- Sediments & Sedimentary Rocks	Ch. 7
6 Sept. 26	M - Sediments & Sedimentary Rocks W- Metamorphic Rocks F - <del>Exam 1 – Oct. 2</del>	Ch. 8
7 Oct. 3	<b>Surface Processes</b> M- Hydrologic Cycle & Soils W - Landslides F- Streams & Floods	Interlude F & Ch. 7 Ch. 16 Ch. 17
8 Oct. 10	M – <b>Fall Breather – No Class</b> W- Streams & Floods F- Groundwater	Ch. 19

9 Oct. 17		M- Groundwater W- Glaciers & Ice Ages F- Glaciers & Ice Ages	Ch. 22
10 Oct. 23	<b>Tectonics</b>	M - Volcanoes W- Volcanoes F - Volcanoes	Ch. 9
11 Oct. 31		M – Earthquakes W- Earthquakes F- Earthquakes and Seeing Inside Earth	Ch. 10 Interlude D
12 Nov. 7		M - Crustal Deformation & Mountain Building W- Crustal Deformation & Mountain Building F- Crustal Deformation & Mountain Building	Ch. 11
13 Nov. 14	<b>Earth History</b>	M- Fossils W- Geologic Time & Stratigraphy F- Geologic Time & Stratigraphy	Interlude E Ch. 12
14 Nov. 21		<b>M - Exam 2 – Nov. 21</b> <b>W - No Class – Fall Break</b> <b>F - No Class – Fall Break</b>	
15 Nov. 28	<b>Earth Resources</b>	M – Petroleum Resources W- Alternative Energy F- Discussion – Energy & Politics	Ch. 14 Ch. 14
16 Dec. 5		M – Global Change	Ch. 23

**Final Exam:                    December 14<sup>th</sup> – 9:00 am**