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**EARTH SCIENCE TODAY: GEOS 170**  
**SYLLABUS: Spring 2013**

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**Description and Objectives**

Earth Science Today is a study of selected subjects in Earth Science. Exact course coverage will vary somewhat, but at least six of the following will be covered; mineral and energy resources, weather, volcanoes and earthquakes, plate tectonics, planetary science, environmental science, evolution and earth history, geomorphology, along with the geologic background necessary to understand these. Particular emphasis is placed on the critical evaluation of evidence, interpretations, and implications for our current scientific understanding, environmental threats to life on our planet, and/or national or political debate. The course is designed for students with little or no background in geology or the other sciences. Lectures and exercises will (as much as possible) follow discovery-based principles, which will give students a “hands-on” introduction to earth science, and will help demonstrate how science is done. Students will gain an appreciation for the complexities of the earth system, will gain an appreciation for what it means to think scientifically, will better understand what earth scientists do (observation and experimentation), and will begin to see the relevance of a fundamental understanding of geology and earth science to their daily lives.

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**Course Information**

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

**Office:** KH 204/205

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

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

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

**office hours:** M,W,F 10:30- 12:30, T, Th 10:30-11:30 am, and 1:30 to 2:30 pm or whenever I’m in my office

**text:** McConnell, D., and others, THE GOOD EARTH – Introduction to Earth Science – available at the book store

**text web page:** <http://www.aris.mhhe.com>

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

**Building and Room #:** King Hall 218

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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 two primary components of this class. 1) Participation includes attendance and daily questions, work in discussion groups, lab exercises, and reports 2) Tests of knowledge include three quizzes and a final exam.

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**Evaluation/Grading**

The total grade is calculated from a standard 100% scale. The grade will be determined from:

**lecture quizzes (55%):** There will be 3 lecture exams, each worth 13% of the lecture grade. Students will take a comprehensive final exam worth 16% of the total grade. No make-up exams will be offered.

**daily questions (5%):** Each class will begin with a short answer question

**in-class exercises and discussions (40%):** Short exercise and discussion reports will comprise 15% of the grade, and lab activity reports will be worth 25% of the total grade.

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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 477-4318 (Voice) or 1-800-627-3529 (MRS/TTY), FR154 as soon as possible to ensure that accommodations are implemented in a timely fashion.

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**Academic Honesty:** (See MSUM Student Absence Policy, Student Handbook: <http://web.mnstate.edu/s handbook/> (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.

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### Schedule (tentative)

Week	Topic	Reading
1 Jan. 14	<b>Physical Geology</b> M – Logistics, Introduction W- What is Science? & Earth Systems F - Atoms and Elements – What is a mineral?	GE- Ch. 1 GE – Ch. 7.1-7.3
2 Jan. 21	M – <b>MLK = No Class</b> W – Minerals (cont.) F – Minerals Lab	
3 Jan. 28	M- Rocks & the Rock Cycle W- Rocks (continued) F - Rocks (continued)	GE – Ch. 7.4-7.8
4 Feb. 4	M- Rocks (continued) W- Rocks (continued) and Lab F - <b>Lecture Quiz 1 – Feb. 8<sup>th</sup></b>	
5 Feb. 11	M - Plate Tectonics – A scientific revolution W- Plate Tectonics Lab F - Plate Tectonics - Mechanics & Boundaries	GE – Ch. 4 handout GE – Ch. 4.5
6 Feb. 18	M- Plate Tectonics - Mechanics & Boundaries W- Plate Tectonics - Mechanics & Boundaries F- Volcanoes	GE – Ch. 6
7 Feb. 25	M – Volcanoes W- Volcanoes and exercise F- Earthquakes	GE – Ch. 5
8 Mar. 4	M- Earthquakes W- Earthquakes and exercise F - <b>Lecture Quiz 2 – Mar. 8<sup>th</sup></b>	
	<b>Spring Break – Mar. 11 - 15</b>	

9 Mar. 18	<b>Historical Geology</b>	M – Geologic Time W- Stratigraphy and Reading Rocks F- What is a fossil?	GE – Ch. 8 GE – Ch. 8
10 Mar. 25		M - Lab: fossil identification W- How do we know so much about dinosaurs F- <b>Non-instructional day</b>	
11 April 1		M- <b>Non-instructional day</b> W- How do we know so much about dinosaurs F- Dinosaur Lab	
12 April 8	<b>Astronomy</b>	M- Earth/Moon, Earth/Sun, and Planetary Processes W- Earth/Moon, Earth/Sun, and Planetary Processes F- Earth/Moon, Earth/Sun, and Planetary Processes	GE – Ch. 2
13 April 15	<b>Meteorology</b>	M – Streams and Floods W- The Atmosphere F- <b>Lecture Quiz 3 – April 19<sup>th</sup></b>	GE – Ch. 11 GE – Ch. 14
14 April 22		M – Weather W- Weather II F- Climate	GE – Ch. 15 GE – Ch.16
15 April 29		M – Climate W - Global Change F – <b>No Class</b>	GE – Ch.17
16 May 6		M - Global Change	

**Final Exam:**                      **(9:30 section) = May 10<sup>th</sup> - 9 am**  
   **(12:30 section) = May 10<sup>th</sup> - Noon**