**Inquiry Into Earth and Space Science SciEd 1100 Fall 2012**

Class M, W, 8:00 to 9:50 (Latham Hall 111)

Friday 9:00 to 9:50

Instructor: Dr. Chad Heinzel, Rm. 116 Latham Hall

Office hours: M, W 10 to 12 and by appointment (e-mail, call, or set up a meeting in person)

If my door is open and I am in my office you are always welcome to stop by and ask questions!

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Email: [chad.heinzel@uni.edu](mailto:chad.heinzel@uni.edu)

Internet: UNI Earth Sci. FACEBOOK fan page AND [www.exploreiowageology.org](http://www.exploreiowageology.org)

Text: The Good Earth, by McConnell, Steer, Knight, and Owens 2nd Edition…

**Final Exam:** **Dec. 10, Monday, 8 to 9:50AM, Latham Hall Room 111**

\**This is a tentative plan as with science itself me may deviate our course of study if necessary…*

**UNIT 1** **Activity theme schedule Text readings**

Week 1 I. Observations Chapter 1

(Aug. 20-24) II. Science and Society

III. Earth Science

Week 2 IV. Minerals (homogenous) Chapter 7

(Aug. 27-31) V. Rocks (heterogeneous)

Week 3 VI. Weathering (Big pieces into small pieces) Chapter 9

(Sept. 3-7) VII. Soils (Sustain Life)

**Labor Day Monday, Sept. 3 No class**

Week 4 I. Earth History/Geologic Time Chapter 8

(Sept. 10-14)

**UNIT 2 Exam 1, Monday Sept. 17**

Week 5 I. Running water Chapters 11 and 12

(Sept. 17-21) II. Groundwater

Week 6 III. Earth’s dynamic oceans Chapter 13

(Sept. 24-28) *Saturday, Sept. 29 Maquoketa Caves State Park*

Week 7 IV. Earth’s Atmosphere Chapter 14

(Oct. 1-5)

Week 8 V. Moisture, Clouds, and ppt. Chapter 14 and 15

(Oct. 8-12)

Week 9 VI. Air pressure and the wind Chapter 15 and 16

(Oct. 15-19)

Week 10 V. Weather patterns and storms

(Oct. 22-26) VI. Global Climate Change Chapter 17

**UNIT 3**

Week 11 I. Topography

(Oct.29-Nov.2) II. Topographic Maps Handouts

**Exam 2 Friday Nov. 2**

Week 12 *No class Monday or Wednesday*

(Nov.5-9) Friday discussion and maps

Week 13 II. Topographic Maps Handouts

(Nov.12-16) III. GPS & Geographic Information Systems

**Exam 3 Friday Take Home Due Nov. 16**

**UNIT 4**

Week 14 No class Monday, Wednesday, Friday

(Nov. 19-23) *Thanksgiving Break*

Week 15 II. Origins of Modern Astronomy Chapter 2

(Nov. 26-30) III. Light, Astronomical observations

and the Sun

Week 16 IV. Light, Astronomical observations, Chapter 3

(Dec. 3-7) and the sun

Week 17 **Comprehensive** **Final Exam**

(Dec. 10-14) **Dec. 10, Monday, 8 to 9:50AM, Latham Hall Room 111**

**Grading procedure and policies**  A > 93%, A->90%

B > 83%, B->80%

C > 73%, C->70%

D > 63%, D->60%

F < 60%

If you earn 93% of the total points you are guaranteed a grade of A. The lower limit for each grade range will not move up. A curve will not be used in this class.

**There will be no make-up exams after the scheduled exams are given**. Should you have a scheduled conflict, please visit with me well before the exam date. An unexcused absence during an exam will lead to an automatic zero. Emergencies happen and will be dealt with on a case by case basis, if something does happen contact me!

Approximate point distribution (Lecture)

Pop quiz 4 @ 10 pts = 40 pts

Exams 4 @ 80 pts = 320 pts

Activities approx.17 @ 30 pts = 510 pts

Participation: 50 pts = 50 pts

Field experience 1 @ 80 pts = 80 pts

**Approx. total = 1000 points**

**A- =900; B-=800; C-=700; D-=600**

## **Class attendance and participation**

Exam questions will reflect and cover: class discussions, activities, projects, and readings. Anything I say or you do is fair game. Attendance is essential.

**Earth Science Today:** You may submit a current article (E.g. W-CF Courier/ DM Register Newsweek, a Scientific journal) discussing some portion of the Earth Sciences with a short write up (about 2 paragraphs or 1 page) that specifically relates to what we are or have discussed in class. Each article/write-up will be worth 5 points, for a maximum of 15 points that may be added to a lab or lecture exam. The last day for current event submissions is  *November 30th* .

**Academic dishonesty-** Is not tolerated on the UNI campus (the campus wide policy will be followed). You are at UNI to better yourself, so don’t copy another student’s work or cheat in any other way - If caught you will likely fail this course.

**Course objectives (Students)**

Your liberal arts education - Courses in natural science promote an understanding of science as a human process that investigates matter and energy acting within complex organic and inorganic systems. Fundamental principles of both physical and life sciences are included.

**Specifically -**

1. Obtain experience utilizing scientific methodology (observation, hypotheses, experimentation, interpretation, and theory)
2. Gain a fundamental understanding of the Earth (properties and processes)
3. Provide you with valuable information that will give you a basic ‘tool kit’ to go out and actively explore your environment and interpret articles/video of earth science publications.
4. Prepare you for taking upper level earth science courses, allowing you to further explore what you find most fascinating.
5. Work hard and have a great time doing it!

**Tips for doing well in this class**

* Be respectful to your classmates and professor (be on time, listen, keep your discussions specific to the class, and ask a lot of questions.)
* Be a good detective, the concepts that you will be learning are connected, so if you don’t understand a concept (early on) make sure you ask questions, because you will be using that knowledge later on.
* If we have one lecture on the origin of the Earth and three on plate tectonics then take a test, the majority of questions will be about plate tectonics.
* Figure out what is most interesting to you and go with it, I will do everything that I can to help you reach your goals;
* Ask a lot of questions
* Have fun, Earth Science is about exploring and learning from our natural surroundings don’t be afraid to get dirty!

If you have any special needs (a longer test time, testing in a quiet room, etc.)

***Top 10 Big ideas you shouldn’t leave this class without!!!***

BIG IDEA 1. Geologists use repeatable observations & testable ideas to understand & explain our planet.

1.1 **Earth scientists find solutions to society’s needs.** Earth scientists work on challenging problems that face humanity on topics such as climate change and human impacts on Earth. Earth scientists successfully predict hazards to humans and locate and recover natural resources, making possible the flourishing of humans on Earth.

Big Idea 2. Earth is 4.6 billion years old.

**2.1** **Earth’s rocks and other materials provide a record of its history.** Earth scientists use the structure, sequence, and properties of rocks, sediments, and fossils to reconstruct events in Earth’s history. Decay rates of radioactive elements are the primary means of obtaining numerical ages of rocks and organic remains. Understanding geologic processes active in the modern world is crucial to interpreting Earth’s past.

Big Idea 3. Earth is a complex system of interacting rock, water, air, and life.

**3.1** **The four major systems of Earth are the geosphere, hydrosphere, atmosphere, and biosphere.** The geosphere includes a metallic core, solid and molten rock, soil, and sediments. The atmosphere is the envelope of gas surrounding Earth. The hydrosphere includes the ice, water vapor, and liquid water in the atmosphere, the ocean, lakes, streams, soils, and groundwater. The biosphere includes Earth’s life, which can be found in many parts of the geosphere, hydrosphere, and atmosphere. Humans are part of the biosphere, and human activities have important impacts on all four spheres.

Big Idea 4. Earth is continuously changing.

**4.1** **Earth’s geosphere changes through geological, hydrological, physical, chemical, and biological processes that are explained by universal laws.** These changes can be small or large, continuous or sporadic, and gradual or catastrophic.

Big Idea 5. Earth is the water planet.

**5.1** **Water is found everywhere on Earth, from the heights of the atmosphere to the depths of the mantle.** Early in Earth’s history, surface water accumulated through both out-gassing from its interior and the capture of some extraterrestrial ice. Water vapor in the atmosphere condensed and rained out as the planet cooled.

Big Idea 6. Life evolves on a dynamic Earth and continuously modifies Earth.

**6.1** **Fossils are the preserved evidence of ancient life.** Fossils document the presence of life early in Earth’s history and the subsequent evolution of life over billions of years.

Big Idea 7. Humans depend on Earth for resources.

**7.1** **Earth is our home; its resources mold civilizations, drive human exploration, and inspire human endeavors that include art, literature, and science.** We depend upon Earth for sustenance, comfort, places to live and play, and spiritual inspiration.

Big Idea 8. Natural hazards pose risks to humans.

**8.1** **Natural hazards result from natural Earth processes.**These hazards include earthquakes, tsunamis, hurricanes, floods, droughts, landslides, volcanic eruptions, extreme weather, lightning-induced fires, sinkholes, coastal erosion, and comet and asteroid impacts.

Big Idea 9. Humans significantly alter the Earth.

**9.1** **Human activities significantly change the rates of many of Earth’s surface processes.** Humankind has become a geological agent that must be taken into account equally with natural processes in any attempt to understand the workings of Earth’s systems. As human populations and per capita consumption of natural resources increase, so do our impacts on Earth’s systems.

BIG IDEA 10. Becoming an earth scientist is an extremely meaningful and rewarding career!