

An Introduction to Physical Geology

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University of Dubuque



Next to the Dubuque VA Center



Cigarette factory



Presentation outline

- Course website: <http://daleeasley.com>
- Why study science? geology?
- How I became a geologist
- Careers
- A better worldview



Key parts of syllabus

- Use the class website for presentations, helpful links, and the course book (pdf) with review questions and example tests.
- 4 in-class exams plus 2 lab exams, scheduled on the website.
- No make-up exams, but we drop the lowest in-class exam grade.
- Weekly lab assignments are due the following week.



Two student models of a UD education



You pay, and if you don't like what you get, you get your money back.



You pay for access, but if you don't do the work, you don't get much out of it.

Idea Credit: Dave Koch

Simon Sinek: Start with “Why?”



<https://www.youtube.com/watch?v=2Ss78LfY3nE>

Why Study Science?

No matter which college you choose, you have to.

CORE REQUIREMENTS

I. WORLDVIEW SEMINARS

- **WorldView Seminar One: WVS 101**
(1 credit), taken first semester first year
- **WorldView Seminar Two: WVS 201**
(1 credit), taken second semester sophomore year. WVS I and II are interdisciplinary courses having a common syllabus.
- **WorldView Seminar Three** (1 credit), taken any time sophomore, junior or senior year. WVS III is any cross-listed course.
- **WorldView Seminar Four** (1-3 credits), taken senior year. WVS IV (The Senior Seminar) is taken in a student's major department.

II. GENERAL COLLEGE REQUIREMENTS

Category One:

General Required Courses

- **Math or Logic Course:**

(1 or 4 credits, minimum grade of C)

Select one of the following:

1. UDMA 111: Collegiate Mathematics
2. UDMA 112: Algebra
3. A higher-level math course
4. PHI 114: Logical Reasoning

- **Science Lab Course:** (4 credits)

Select one of the following:

1. BIO 111: General Biology
2. UDCM 105: General, Organic, and Biochemistry
3. UDCM 110: Chemistry and Society
4. UDCM 111: General Chemistry
5. ESC 115: Basic Physical Geology
6. PHY 151: General Physics

- **Basic Communication: COM 101**

(3 credits, minimum grade of C)

- **Introduction to Computers: CIS 101**

(3 credits, minimum grade of C)

- **Composition and Rhetoric: ENG 102**

(3 credits, minimum grade of C)

- **Introduction to Research Writing:**

RES 104 (3 credits)

- **Judeo-Christian Tradition:** (3 credits)

Select one of the following:

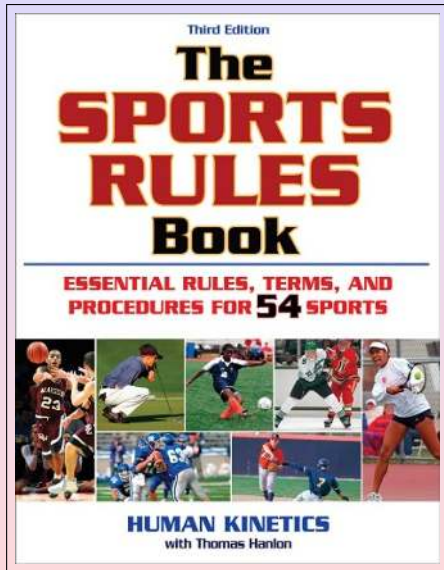
1. REL 110: Judeo-Christian Journeys
2. REL 115: Christian Beliefs
3. REL 116: The Christian Movement
4. REL 220: Introduction to the Old Testament
5. REL 221: Introduction to the New Testament

- **Physical Education:**

Choose one of the following options:

1. Two courses (1 credit each), PED activity classes
2. Participation in two programs sponsored by the UD Wellness Committee. Each program must include at least 8 hours of physical activity over at least 8 weeks of a semester. Students who select this option will receive no course credit for the activities, but the fulfillment of the requirement is noted on their transcript. Attendance at the sessions is mandatory.
3. Participation in an inter-collegiate sport at UD for one full season. Students who select this option will receive no course credit, but the fulfillment of the requirement is noted on their transcript.

But really, *Why Study Science?*



If you're going to play the game, you need to know the rules.

Avoid fighting over stupid stuff!

AMERICA

Two Men Will Serve Jail Time For Beating Giants Fan

February 20, 2014 - 3:05 PM ET

EYDER PERALTA

Two men, who pleaded guilty to beating a Giants fan at a Dodger Stadium in 2011, will serve time in jail, a judge in Los Angeles decided on Thursday.

Reuters reports:

"Louie Sanchez, 31, who attacked [Bryan] Stow from behind and knocked him to the ground, pleaded guilty in court on Thursday to a charge of mayhem and was sentenced to eight years in prison; the Los Angeles District Attorney's Office said in a statement.

Sport | Football

World Cup | Football | Live scores | Fixtures | Results | Tables | Pre

▲ Sport | Football

Man kills his friend in argument over Lionel Messi and Cristiano Ronaldo



Sports | Soccer

Soccer Referee Beheaded During Amateur Match In Brazil; Warning Graphic Video Link

But really—*Why?*

Fun is the genetic reward for learning!



Science—a powerful worldview



Geology—the story of the Earth

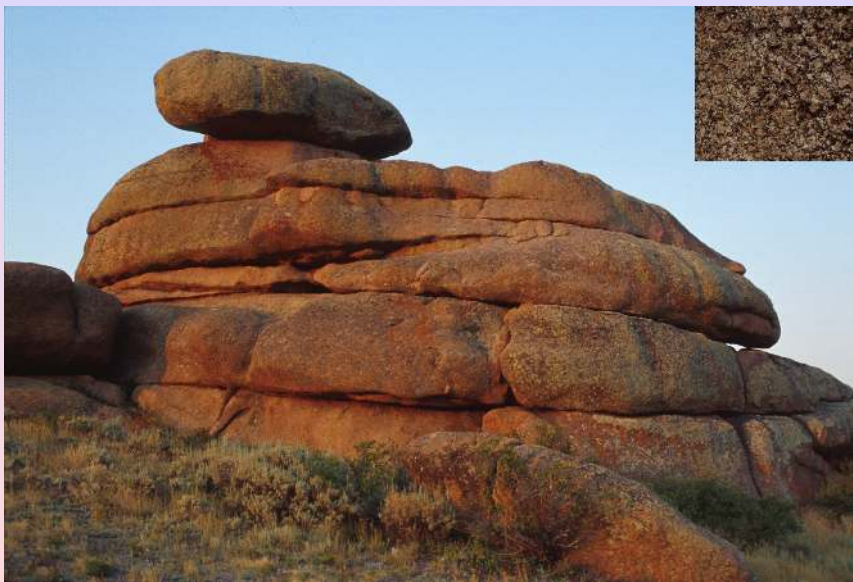


The alphabet: minerals



<https://en.wikipedia.org/wiki/Malachite#/media/File:Malachite-41365.jpg>

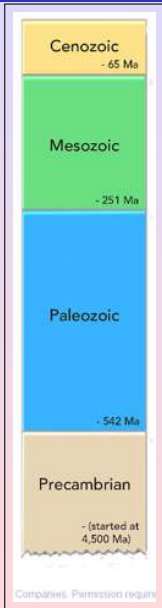
The words: rocks and fossils



The sentences, paragraphs and pages: layers of sedimentary rocks



The chapters: geologic eras



How I became a geologist



I first taught high-school math in Kenya.

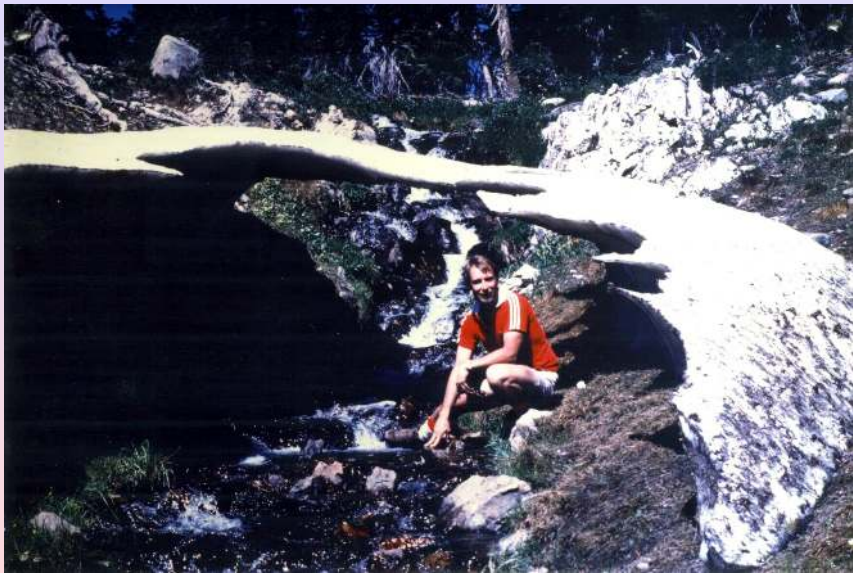
My students



Climbing Mt Kenya



Grad school in Wyoming



University of New Orleans



Careers in geology and environmental science

- Natural resource utilization: petroleum, natural gas, mining, soils
- Environmental consulting
- Government: DNR, EPA, MMS, USGS
- Education
- Research



Environmental Science Education



- Intro to Environmental Science and EVS electives
- Physical and Environmental Geology
- Statistics and Calculus/Adv Quant Methods
- Chemistry
- Zoology, Botany, and Ecology

Minimum job requirements

- B.S.: Almost any job
- M.S.: Most geology jobs and well-paying environmental jobs
- Ph.D.: Common for
 - Research
 - Consulting
 - Education



What causes natural disasters?

Iranian cleric: Promiscuous women cause quakes

AP Associated Press

 Buzz up! 220 votes  Send  Share  Print



AP — FILE — In this Saturday, Dec. 1, 2007 file photo, two conservatively-dressed Iranian women walk past ...

 Earthquakes Video: **6.5 magnitude earthquake hit southwest of Taiwan**

By SCHEHEREZADE FARAMARZI, Associated Press Writer — Mon Apr 19, 1:35 pm ET

BEIRUT — A senior Iranian cleric says women who wear immodest clothing and behave promiscuously are to blame for earthquakes.

Iran is one of the world's most earthquake-prone countries, and the cleric's unusual explanation for why the earth shakes follows a prediction by President Mahmoud Ahmadinejad that a quake is certain to hit Tehran and that many of its 12 million inhabitants should relocate.

"Many women who do not dress modestly ... lead young men astray, corrupt their chastity and spread adultery in society, which (consequently) increases earthquakes," Hojatoleslam Kazem Sedighi was quoted as saying by Iranian media. Sedighi is Tehran's acting Friday prayer leader.

Women in the Islamic Republic are required by law to cover from head to toe, but many, especially the young, ignore some of the more strict codes and wear tight coats and scarves pulled back that show much of the hair.

"What can we do to avoid being buried under the rubble?" Sedighi asked during a prayer sermon Friday. "There is no other solution but to take refuge in religion and to adapt our lives to Islam's moral codes."

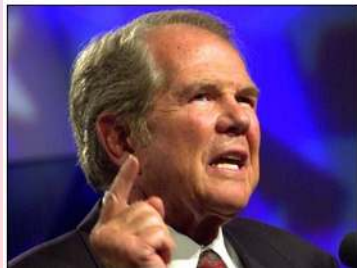
Are Iranian women worse than LA women?

Location	Magnitude	Deaths
Los Angeles	6.7	61
Bam, Iran (pop 97,000)	6.6	26,271



Superstitious explanations

"[S]omething happened a long time ago in Haiti and people might not want to talk about it. They were under the heel of the French. Napoleon the Third and whatever. And they got together and swore a pact to the devil. They said, 'We will serve you if you get us free from the prince.' True story. And so the devil said, 'OK, it's a deal.'



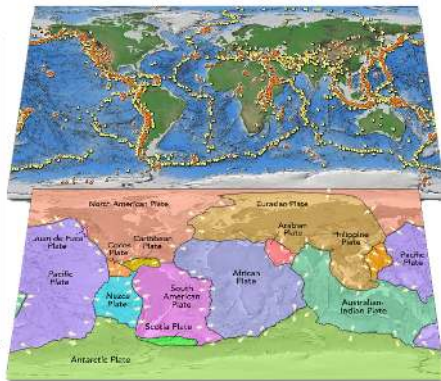
They kicked the French out, the Haitians revolted and got themselves free. But ever since, they have been cursed by one thing after the other, desperately poor. "

Statistics on Earthquakes

Magnitude	Average Annually
8 and higher	1 ¹
7 - 7.9	15 ¹
6 - 6.9	134 ²
5 - 5.9	1319 ²
4 - 4.9 (estimated)	13,000
3 - 3.9 (estimated)	130,000
2 - 2.9 (estimated)	1,300,000

¹ Based on observations since 1900.

² Based on observations since 1990.



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(Haitian Earthquake, 2010: Magnitude 7)

Uniformitarianism: The present is key to the past



42% of all unintentional childhood deaths are due to crashes.

NHTSA 2002 Child Passenger Safety Technician Program Participant Manual pg. C-4

Compared with seat belts, child restraints, when not seriously misused were associated with a 28% reduction in risk for death in children aged 2 through 6 years.

Archives of Pediatric and Adolescent Medicine, Vol. 160 No. 6, June 2006

A superstitious explanation

“Hurricane Katrina was, in fact, the judgment of God against the city of New Orleans.”

“New Orleans had a level of sin that was offensive to God,” [Pastor John] Hagee said, because “there was to be a homosexual parade there on the Monday that the Katrina came.”



A superstitious explanation

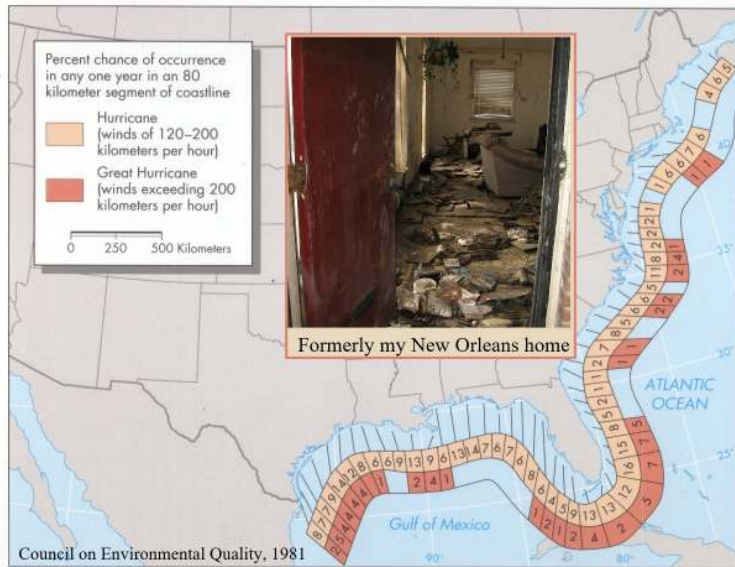
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The facts:

- Both seminaries in New Orleans were destroyed
- Approximately 900 churches, synagogues or mosques were destroyed
- Nearly 85 percent of those killed were older than 51, 60 percent older than 65 and almost half were older than 75.

A uniformitarian explanation



What scientists really do

- Make observations
- Look for patterns
- Guess why the patterns occur
- Make predictions based on their guess
- Test the quality of those predictions

