

INTRODUCTION TO EARTH HISTORY version 1.0

SPRING, 2009

Spring Semester: 2009

Geology 1020, 3 cr., section 002

Class Meets 1230pm – 145pm Tuesdays and Thursdays in Benson 180

Office Hours Tuesday 930am – 1030pm, Thursday 200pm – 300pm, or by appointment

Prof. Stephen J. Mojzsis

Benson Earth Science Bldg., Rm. 222A

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CLASS WEBSITE <http://isotope.colorado.edu/~geol1020>

REQUIRED TEXTBOOK Earth System History (Steven M. Stanley) 3rd Edition

GENERAL LECTURE TOPICS AND READING SCHEDULE

UNIT I. The Earth as a Dynamic System

Week 1 – Fundamentals of Geology I

Tue. 01/13

1. About the instructor and the course; concepts of Uniformitarianism & Catastrophism

Ch. 1

Thu. 01/15

2. Nature and Origin of rocks; Science Education Initiative announcement & exercise

Ch. 1

Web-based Homework #1 due before Thursday next week (January 22)

Week 2 – Fundamentals of Geology II

Tue. 01/20

4. Introduction to Geologic Time & the Geologic Timescale

Ch. 6

Thu. 01/22

5. Estimates of Earth's age

Ch. 6

Homework #2 due Thursday (January 29)

Week 3 – Fundamentals of Geology III

Tue. 01/27

6. Rock Cycle: Plate tectonics, the tectonic cycle, earthquakes, volcanism

Ch. 2

***Extra Credit: Geological Sciences Colloquium: K. Konhauser (University of Manitoba)
"What banded iron formations tell us about the Precambrian" Wednesday January 28, 4pm
BESC180***

Thu. 01/29

7. Major geochemical cycles (Silica, carbon, water, sediments/rock)

Ch. 10

Homework #3 due Thursday (February 5)

UNIT II. The Diversity of Life on Earth – Biological Evolution

Week 4 – Change in Geology

Tue. 02/03
8. Evolution – Biological, Chemical, Geological Ch. 7

Thu. 02/05
9. Biological Evolution and change in Earth history Ch. 7

Homework #4 due Thursday (February 12)

Week 5 – Records of past life

Tue. 02/10
10. Evolution and our interpretation of the fossil record Ch. 7
156-160

Thu. 02/12
11. Fossils, modes of origin, preservation and interpretation handouts

Homework #5 due Thursday (February 19)

Week 6 – Interpreting the history of (contemporary) life

Tue. 02/17
12. Genes, DNA and chromosomes, population, species and speciation Ch. 7

Thu. 02/19
13. Kingdoms: taxonomy, phylogenetic trees Ch. 7

Homework #6 due Thursday (February 26)

Week 7 – Geobiological classifications of (contemporary) life

Tue. 02/24
14. Prokaryotae: The two Domains of Bacteria and Archaea handouts

Thu. 02/26
15. Domain Eukarya: Protists, Fungi, Plants and Animals handouts

No Homework – Study for Midterm Exam – Study Guide Available Online & in lecture

Week 8 – Origin of the Cosmos and Earth

16. Tuesday March 3, 12:30pm – 1:45pm **Midterm Exam in our regular lecture hall**

(A special review session will be scheduled prior to the Midterm Exam)

UNIT III. Earth and Life

Thu. 03/05
17. The Origin of the Cosmos and Primordial Earth Ch. 11

Homework #7 due Thursday (March 12)

Week 9 – Toward a habitable world

Tue. 03/10
18. The emergence of life on Earth; reproduction Ch. 11

Thu. 03/12
19. The Archean/Proterozoic transition, Global events and biogeochemical evolution Ch. 12

Homework #8 due Thursday (March 19)

Week 10 – Coupled Geological and Biological Evolution in the Proterozoic

Tues. 03/17
20. Expansion and contraction of continents, continent reconstructions, Pangea Ch. 13

Thu. 03/19
21. Geological and environmental changes: the Precambrian/Cambrian boundary Ch. 13

Week 11 **SPRING BREAK, NO CLASSES March 27 & March 29**

Week 12 – Life in the oceans, life on the land

Tue. 03/31
22. CU Museum of Natural History fieldtrip Ch. 14

Thu. 04/02
23. Early to Mid-Paleozoic geology; Invasion of the land Ch. 15

Homework #9 due Thursday (April 9)

Unit IV. Changing Oceans, Changing Climates

Week 13 – All contemporary forms of life are established

Tue. 04/07
24. Late Paleozoic to Mesozoic geology (& the Boulder Flatirons) Ch. 16

Thu. 04/09
25. Atmospheric CO₂, the Carboniferous-Permian climate Ch. 16

Homework #10 due Thursday (April 16)

Week 14 – Triassic and Jurassic Parks

Tue. 04/14
26. Dawn of a new era, the Mesozoic and the rise of the dinosaurs Ch. 17

Thu. 04/16
27. Tectonics and Paleogeography of the Mesozoic Ch. 17

Homework #11 due Thursday (April 23)

Week 15 – The rise and bitter fall of the dinosaurs

Tue. 04/21
28. Mesozoic to Cenozoic transition Ch. 17

Thu. 04/23
29. The Terminal Cretaceous Extinction Ch. 18

Homework #12 due Thursday (April 30)

UNIT V. To the Modern World

Week 16 – Climate change, mammals, birds and flowers

Tue. 04/28
30. Mammals and Flowers Ch. 19

Thu. 04/30
31. The origin of humans and mass extinctions: past, present and future Ch. 20

Final Exam – Cumulative

Tuesday, May 5 Benson Earth Sciences Room 180 (4:30 PM – 7:00 PM)

(NOTE: a special review session will be scheduled prior to the final exam)