

SCIENCE 111 - Natural Science

INSTRUCTOR: Dr. Mark A Bransford

E-MAIL: bransford.mark@mayo.edu

OFFICE HOURS: By appointment

PHONE: 254-4430

TEXTS:

Geology: Earth: Portrait of a Planet, Second Edition (Paperback) by Stephen Marshak
Paperback: 740 pages, **Publisher:** W. W. Norton & Company; 2 edition (December 2004),
ISBN-10: 0393925021, **ISBN-13:** 978-0393925029

Biology: Biology: Concepts & Connections with Student CD-ROM (5th Edition) (Hardcover)
by Neil A. Campbell, Jane B. Reece, Martha R. Taylor, Eric J. Simon
Hardcover: 912 pages, **Publisher:** Benjamin Cummings; 5 edition (March 29, 2005),
ISBN-10: 0805371605, **ISBN-13:** 978-0805371604

Additional content material will be provided via the course web site or via in-class handouts.

COURSE DESCRIPTION:

This course is the second semester of a two-semester survey of Natural Science. It focuses on the exploration of major concepts in geology and biology. See the weekly schedule for a more in-depth description of the material covered. The course is combination of lectures and labs that emphasizes the practical application and/or use of the ideas discussed. The labs will meet 2 times, both on Saturday afternoons (Saturday October 24th & Saturday December 5th), each covering labs in geology and biology, respectively.

OBJECTIVES:

1. To understand the nature, purpose, and scope of the natural sciences.
 2. To experience the scientific process by taking on the role of a scientific explorer.
 3. To learn about geology and biology as scientific disciplines: how they are related and why they exist.
 4. To develop a working understanding of fundamental concepts in geology and biology
-

EVALUATION:

Here are the percentage breakdowns of the various assessments used in this course:

- Exams (x 4 – 10% each) 40%
- Homework assignments 20%
- Labs 40%

Attendance is required and will be taken in class and labs. Please talk to me if you need to miss a class.

ASSIGNMENT INFORMATION:

There will be reading assignment that I will expect to be completed for every class that we meet.

Lectures

Reading assignments are critical. Having read the material before class will make the lectures much more understandable, and give you an opportunity to ask me questions about the text that may have been confusing. I ask a lot of questions in class, so those who complete the reading assignments are typically very clear. Lectures will typically consist of two 50 minute lectures, with 10 min breaks after each.

Labs

We will be meeting at RCTC's lab facilities 2 times over the course of the trimester, Saturday October 24th & Saturday December 5th. The labs will span an afternoon, 4 hours for each meeting. The 1st lab session will cover the geology material, and the 2nd will cover the biology material.

COURSE PERSPECTIVE, SKILL, and PREREQUISITE:

Natural World (NW) Perspective:

SCI 111 meets one course credit of the NW perspective, either NW1 or NW2. "This perspective is intended to help students understand themselves in relation to the physical world. Their active role as observers, explorers, and moral agents will be emphasized. Sufficient training in scientific knowledge, concepts, and methods will be provided to equip students for critical and intelligent participation in public debates on technical issues."

Quantitative Reasoning Skill (QR):

SCI 111 meets the QR graduation skill requirement at Augsburg College. QR allows one to be able to properly justify conclusion based on quantitative evidence and its interpretation. Since many scientific ideas find their best and most useful expression in mathematical form, mathematics is a necessary part of this course (note the MPG3 prerequisite below). Moreover, mathematical, statistical, and graphical methods will be used to analyze and interpret experimental data, and the results will be employed to make judgments about competing hypotheses or proposals related to them and for comparison with results drawn from other student's experiments as well as the formal scientific literature.

Mathematics Placement Prerequisite:

This course has a prerequisite of Math Placement Group 3 (MPG3) or above and will make liberal use of simple algebra and graphing skills appropriate to the MPG3 level. Because many students registered for this course may have taken their math placement exams some time ago, it is strongly recommended that you refresh your mathematics skills in order to do well in this course. You can do this by working the problems available via the college's web site at:

<http://www.augsburg.edu/advising/mathtest.html>

If you experience difficulty that you believe may be related to problems in mathematics understanding or facility please see one of the instructors immediately.

ACADEMIC HONESTY:

In accordance with Augsburg's academic honesty policy, students will sign a statement near the beginning of the course and write the word "pledged" on each assignment and test to reaffirm your commitment to student honesty.

WEEKLY SCHEDULE

Before each class meeting, read the chapter titles given below (book title in parenthesis next to the date that class meets)

1. Lecture 1 (Earth: Portrait of a Planet)
 - a. Ch 1: Cosmology and the Birth of the Earth
 - b. Ch 2: Journey to the Center of the Earth
2. Lecture 2 (Earth, Portrait of a Planet)
 - a. Ch 3: Drifting Continents and Spreading Seas
 - b. Ch 4: The Way the Earth Works: Plate Tectonics
3. Lecture 3 (Earth, Portrait of a Planet)
 - a. Exam I (Earth, Portrait of a Planet: Chapters 1-4)
 - b. Ch 9: The Wrath of Vulcan: Volcanic Eruptions
 - c. Ch 10: A Violent Pulse: Earthquakes, begin
4. Lecture 4 (Earth, Portrait of a Planet)
 - a. Ch 10: A Violent Pulse: Earthquakes, finish
 - b. Ch 20: An Envelope of Gas: Earth's Atmosphere and Climate
5. Lecture 5 (Biology: Concepts and Connections)
 - a. Exam II (Earth, Portrait of a Planet: Chapters 9,10,20)
 - b. Ch 2: Chemical Basis of Life (Chemistry review)
 - c. Ch 3: The Molecules of Cells
6. Lecture 6 (Biology: Concepts and Connections)
 - a. Ch 4: A Tour of the Cell
 - b. Ch 5: The Working Cell
7. Lecture 7 (Biology: Concepts and Connections)
 - a. Exam III (Biology: Concepts and Connections: Chapters 2-5)
 - b. Ch 6: How Cells Harvest Chemical Energy
 - c. Ch 10: Molecular Biology of the Gene
8. Final meeting
 - a. Exam IV (Biology: Concepts and Connections: Chapters 6,10)
9. Labs
 - a. Saturday October 24th: 3-4 geology labs (details TBA)
 - b. Saturday December 5th: 3-4 biology labs (details TBA)