

Washtenaw Community College Comprehensive Report

GLG 100 Introduction to Earth Science

Effective Term: Fall 2012

Course Cover

Division: Math, Science and Health

Department: Physical Sciences

Discipline: Geology

Course Number: 100

Org Number: 12330

Full Course Title: Introduction to Earth Science

Transcript Title: Introduction to Earth Science

Is Consultation with other department(s) required: No

Publish in the Following: College Catalog , Time Schedule , Web Page

Reason for Submission: Course Change

Change Information:

Total Contact Hours

Outcomes/Assessment

Rationale: This change is necessary to align this course with the federal mandate that defines minimum contact hours for science laboratory courses.

Proposed Start Semester: Fall 2012

Course Description: This course provides a basic understanding of the major branches of earth science, including geology, hydrology and meteorology. It is designed to develop an awareness and appreciation for these geosystems and their important interrelationships, as well as an understanding of the scientific approach to problem-solving. This course will include an overview of both local and global environmental problems as well as a discussion of possible solutions.

Course Credit Hours

Variable hours: No

Credits: 4

Lecture Hours: Instructor: 45 **Student:** 45

Lab: Instructor: 45 **Student:** 45

Clinical: Instructor: 0 **Student:** 0

Total Contact Hours: Instructor: 90 **Student:** 90

Repeatable for Credit: NO

Grading Methods: Letter Grades

Audit

Are lectures, labs, or clinicals offered as separate sections?: NO (same sections)

College-Level Reading and Writing

College-level Reading & Writing

College-Level Math

No Level Required

Requisites

General Education

MACRAO

MACRAO Science & Math

MACRAO Lab Science Course
General Education Area 4 - Natural Science
Assoc in Applied Sci - Area 4
Assoc in Science - Area 4
Assoc in Arts - Area 4

Request Course Transfer

Proposed For:

Central Michigan University
Eastern Michigan University
Ferris State University
Grand Valley State University
Jackson Community College
Michigan State University
Oakland University
University of Michigan
Wayne State University
Western Michigan University

Student Learning Outcomes

1. Recognize and identify introductory principles and concepts of the earth sciences, including geology, hydrology and meteorology, as well as the environmental concerns associated with each.

Assessment 1

Assessment Tool: Departmental Exams

Assessment Date: Winter 2013

Assessment Cycle: Every Three Years

Course section(s)/other population: All sections.

Number students to be assessed: Random sample of 50% of students from each section offered with a minimum of one full section.

How the assessment will be scored: Multiple choice questions will be scored using the key. Essay and short answer questions will be scored using a departmentally-developed rubric.

Standard of success to be used for this assessment: Students will score an overall average score of 72.5% or better on each assessment question.

Who will score and analyze the data: Appropriate geology faculty will analyze the data.

2. Apply appropriate principles and concepts to solve problems, as well as construct and interpret maps, charts, diagrams and graphs.

Assessment 1

Assessment Tool: Departmental Exams

Assessment Date: Winter 2013

Assessment Cycle: Every Three Years

Course section(s)/other population: All sections.

Number students to be assessed: Random sample of 50% of students from each section offered with a minimum of one full section.

How the assessment will be scored: Multiple choice questions will be scored using the key. Essay and short answer questions will be scored using a departmentally-developed rubric.

Standard of success to be used for this assessment: Students will score an overall average score of 72.5% or better on each assessment question.

Who will score and analyze the data: Appropriate geology faculty will analyze the data.

Course Objectives

1. Describe the formation of the universe, solar system and Earth's moon.
Matched Outcomes
2. Identify and classify rocks and minerals based on their physical and chemical properties.
Matched Outcomes
3. Compare and contrast renewable and non-renewable resources.
Matched Outcomes
4. Identify the conditions necessary for coal and oil formation, the usage and depletion of these resources and possible fuel alternatives.
Matched Outcomes
5. Compare and contrast chemical and mechanical weathering.
Matched Outcomes
6. Identify the triggers and hazards of various mass wasting types.
Matched Outcomes
7. Determine the soil profiles of soil variations found in Washtenaw County using a soil profile map.
Matched Outcomes
8. Identify the texture of soil based on the calculated proportions of the components of a soil sample.
Matched Outcomes
9. Distinguish and apply absolute dating from relative dating techniques to determine the ages of various rock layers.
Matched Outcomes
10. Use the geologic time scale to identify fossils from different geologic periods.
Matched Outcomes
11. Analyze trace fossils to determine clues on the lives of extinct organisms.
Matched Outcomes
12. Compare and contrast the hypothesis of continental drift to the theory of plate tectonics.
Matched Outcomes
13. Explain the key pieces of "evidence" used to support the theory of plate tectonics.
Matched Outcomes
14. Draw and label the major tectonic boundaries of the world.
Matched Outcomes
15. Match plate boundaries with associated features and processes, including mountains, volcanoes and earthquakes.
Matched Outcomes
16. Locate examples of each plate boundary throughout the world.
Matched Outcomes
17. Identify various waves on seismographs and use them to determine the distance from the epicenter of an earthquake.
Matched Outcomes
18. Label the layers of the Earth and identify the composition, pressure and temperature conditions associated with each.
Matched Outcomes
19. Locate and classify major volcanoes around the world.
Matched Outcomes
20. Identify the methods used to predict and describe natural disasters involving the geosphere, including: earthquakes and volcanism.
Matched Outcomes
21. Interpret geologic maps and structures, including the various forms of deformation, joints, faults and folds.
Matched Outcomes
22. Use topographic maps to locate and identify geological features.
Matched Outcomes
23. Draw topographic map profiles.
Matched Outcomes
24. Identify the erosional, transportational and depositional qualities and features of running water.

- Matched Outcomes**
25. Compare and contrast the features and properties of young and mature river systems.
- Matched Outcomes**
26. Distinguish amongst ground hydrology terms, such as porosity, permeability, aquifer, aquitard, perched water table, water table, caverns and karst topography.
- Matched Outcomes**
27. Compare and contrast porosity and permeability in soils and relate these terms to groundwater flow.
- Matched Outcomes**
28. Describe the features associated with geothermal energy, including geysers, hot springs and possible uses as an alternative energy source.
- Matched Outcomes**
29. Explain the mechanics involving the formation, advancement and retreat of a glacier.
- Matched Outcomes**
30. Describe the possible causes of glacial periods or ice ages, their effect on climate, living things and the topography of the land.
- Matched Outcomes**
31. Interpret and identify erosional and depositional glacial features on maps and diagrams.
- Matched Outcomes**
32. Construct a mapped cross section of the seafloor, labeling the various features of the seafloor.
- Matched Outcomes**
33. Identify and draw the major surface currents of the oceans.
- Matched Outcomes**
34. Analyze the effects of salinity and temperature differences on the density of seawater.
- Matched Outcomes**
35. Understand the physics of tidal movement and the generation of waves on water.
- Matched Outcomes**
36. Identify the causes, consequences and possible prevention or detection of natural disasters involving the hydrosphere, including: flooding, sinkholes, tsunamis.
- Matched Outcomes**
37. Analyze negative human-related effects on the hydrosphere, including contamination and depletion of surface, ground and ocean water.
- Matched Outcomes**
38. Identify various forms of beach destruction and protection.
- Matched Outcomes**
39. Define the makeup and percentage of gases in the atmosphere.
- Matched Outcomes**
40. Given a structural diagram of the atmosphere, identify layers of the atmosphere based on characteristics unique to each layer and temperature changes found within each layer.
- Matched Outcomes**
41. Describe the concerns and causes for ozone depletion.
- Matched Outcomes**
42. Using a graph, identify how pressure changes with altitude.
- Matched Outcomes**
43. Compare and contrast the various motions and their effects on the Earth, including rotation, revolution and precession.
- Matched Outcomes**
44. List the two reasons for the variation in solar energy reaching locations on Earth, and causing Earth's seasons.
- Matched Outcomes**
45. Identify the seasons (in both hemispheres) by date, hours of sunlight received and the axial tilt of the Earth.
- Matched Outcomes**
46. Define the greenhouse effect, listing the positive and potential negative outcomes of the effect on Earth.
- Matched Outcomes**

47. Explain the global warming theory, including arguments both for and against the theory.
Matched Outcomes
48. View and critique the video, "An Inconvenient Truth."
Matched Outcomes
49. Complete a global warming WebQuest (online activity) using a computer and the Internet.
Matched Outcomes
50. Explain the Milankovitch theory and how it relates to the creation of ice ages on Earth.
Matched Outcomes
51. Identify the possible outcomes of ice ages and their effects on humans and the environment.
Matched Outcomes
52. State and explain the five controls of temperature and how they affect the temperature of various locations around Earth.
Matched Outcomes
53. Construct and explain isothermal maps.
Matched Outcomes
54. Using a sling psychrometer and related charts, calculate relative humidity and dew points.
Matched Outcomes
55. Explain the various processes and heat exchanges involved in the hydrologic cycle.
Matched Outcomes
56. Define and explain the mechanisms creating cloud formation, including the processes of collision-coalescence and the Bergeron Process.
Matched Outcomes
57. Using pictures and descriptions, identify the ten most common clouds and their associated weather.
Matched Outcomes
58. Identify various fog and precipitation types based on descriptions and temperature conditions.
Matched Outcomes
59. Record daily weather observations for a period of one month.
Matched Outcomes
60. List five differences between high and low pressure.
Matched Outcomes
61. State and explain what causes wind using pressure gradient, Coriolis Effect and friction.
Matched Outcomes
62. Compare and contrast El Nino and La Nina.
Matched Outcomes
63. Identify and label global winds and pressure zones on Earth.
Matched Outcomes
64. Identify symbols, define terms and describe the origin and movement of air masses and fronts.
Matched Outcomes
65. Describe and interpret synoptic weather symbols at any given point on a weather map.
Matched Outcomes
66. Explain the process of cyclogenesis, or the formation of a midlatitude cyclone.
Matched Outcomes
67. Using weather maps, locate positions of fronts, air pressure zones, cyclones and anticyclones; also, state past, current and future weather for given locations on the weather map.
Matched Outcomes
68. Using data collected in the weather observations project, determine cyclone, anticyclone, air mass and frontal passages.
Matched Outcomes
69. Identify the causal effects, warning systems and precautions for severe weather, including thunderstorms, tornadoes and hurricanes.
Matched Outcomes

New Resources for Course
Course Textbooks/Resources

Textbooks

Thompson and Turk. *Earth*, 1 ed. Brooks/Cole Cengage Learning, 2011, ISBN: 0-538-74099-x.

Manuals

Periodicals

Software

Equipment/Facilities

Level III classroom

Computer workstations/lab

TV/VCR

Reviewer

Action

Date

Faculty Preparer:

Suzanne Albach

Faculty Preparer

Mar 14, 2012

Department Chair/Area Director:

Kathleen Butcher

Recommend Approval

Mar 27, 2012

Dean:

Martha Showalter

Recommend Approval

Mar 28, 2012

Vice President for Instruction:

Stuart Blacklaw

Approve

Apr 11, 2012