

Washtenaw Community College Comprehensive Report

GLG 202 Earth Science for Elementary Teachers Effective Term: Winter 2018

Course Cover

Division: Math, Science and Engineering Tech

Department: Physical Sciences

Discipline: Geology

Course Number: 202

Org Number: 12330

Full Course Title: Earth Science for Elementary Teachers

Transcript Title: Earth Science for Elem Teacher

Is Consultation with other department(s) required: No

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

Reason for Submission: Three Year Review / Assessment Report

Change Information:

Course description

Outcomes/Assessment

Rationale: The master syllabus on file is missing the following information for the outcomes: 1. How the assessment will be scored. 2. Standard of success to be used for this assessment. 3. Who will score and analyze the data.

Proposed Start Semester: Winter 2018

Course Description: This course utilizes laboratory activities, lecture and projects to present the content and methodology necessary for success in teaching Earth Science in the elementary classroom. Various geology topics will be covered such as the geosphere, hydrosphere, atmosphere, environmental issues and space. Teaching methodology includes developing a portfolio of activity plans, presenting an activity from those plans and creating a bulletin board pertaining to an Earth science concept. This course is intended for early childhood and elementary education students only.

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

Requisites

General Education

MACRAO

MACRAO Science & Math

MACRAO Sci & Math Elementary Education

General Education Area 4 - Natural Science

Assoc in Arts - Area 4

for Elementary and Early Childhood

Michigan Transfer Agreement - MTA

MTA Lab Science

Request Course Transfer

Proposed For:

Student Learning Outcomes

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

Assessment 1

Assessment Tool: Common Test question

Assessment Date: Fall 2020

Assessment Cycle: Every Three Years

Course section(s)/other population: All students enrolled in course.

Number students to be assessed: All students from each section offered.

How the assessment will be scored: Answer key and rubric

Standard of success to be used for this assessment: 75% of the students will score 75% or higher

Who will score and analyze the data: Appropriate geology instructors that teach this course.

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

Assessment 1

Assessment Tool: Common test questions

Assessment Date: Fall 2020

Assessment Cycle: Every Three Years

Course section(s)/other population: All students enrolled in course.

Number students to be assessed: All students from each section offered.

How the assessment will be scored: Answer key and rubric

Standard of success to be used for this assessment: 75% of the students will score 75%, or higher

Who will score and analyze the data: Appropriate geology instructors that teach this course.

3. Employ appropriate teaching methodology to successfully create and present lesson plans.

Assessment 1

Assessment Tool: Teaching presentations

Assessment Date: Fall 2020

Assessment Cycle: Every Three Years

Course section(s)/other population: All students enrolled in course.

Number students to be assessed: All students from each section offered.

How the assessment will be scored: Departmentally-developed rubric

Standard of success to be used for this assessment: 75% of the students will score 75%, or

higher

Who will score and analyze the data: Appropriate geology instructors that teach this course.

Assessment 2

Assessment Tool: Lesson portfolio

Assessment Date: Fall 2020

Assessment Cycle: Every Three Years

Course section(s)/other population: All students enrolled in course.

Number students to be assessed: All students from each section offered.

How the assessment will be scored: Departmentally-developed rubric

Standard of success to be used for this assessment: 75% of the students will score 75%, or higher

Who will score and analyze the data: Appropriate geology instructors that teach this course.

Course Objectives

1. Describe the steps of the scientific method.
2. Demonstrate the scientific method.
3. Describe the formation of the universe using the Big Bang theory.
4. Explain the formation of our solar system using the Nebular theory.
5. Understand the formation of Earth's moon using the Impact theory.
6. Identify the phases of the moon.
7. Explain how the moon and sun generate tides on Earth.
8. Distinguish between lunar and solar eclipses.
9. Identify and classify minerals based on their physical and chemical properties.
10. Compare and contrast renewable and non-renewable resources.
11. Identify the conditions necessary for coal and oil formation, the usage and depletion of these resources and possible fuel alternatives.
12. Identify and classify rocks based on their physical and chemical properties.
13. Compare and contrast chemical and mechanical weathering.
14. Identify the texture of soil based on the calculated proportions of the components of a soil sample.
15. Distinguish and apply absolute dating from relative dating techniques to determine the ages of various rock layers.
16. Analyze trace fossils to determine clues on the lives of extinct organisms.
17. Compare and contrast the hypothesis of continental drift to the theory of plate tectonics.
18. Explain the key pieces of "evidence" used to support the theory of plate tectonics.
19. Match plate boundaries with associated features and processes, including mountains, volcanoes and earthquakes.
20. Locate examples of each plate boundary type throughout the world.
21. Describe the layers of the Earth and identify the composition, pressure and temperature conditions associated with each.
22. Classify major volcano types, including strato/composite cones, cinder cones and shield volcanoes.
23. Classify types of mountains, including fold, fault-block, dome, etc.
24. Create models of fault types, including normal, reverse and strike-slip.
25. Identify the methods used to predict and describe natural disasters involving the geosphere, including earthquakes and volcanism.
26. Identify the erosional, transportational and depositional qualities and features of running water.
27. Compare and contrast the features and properties of young and mature river systems.
28. Distinguish amongst ground hydrology terms, including: porosity, permeability, aquifer, aquitard, perched water table, water table, caverns, karst topography, etc.
29. Compare and contrast porosity and permeability in soils and relate these terms to groundwater flow.
30. Describe the features associated with geothermal energy, including geysers, hot springs and possible uses as an alternative energy source.
31. Explain the mechanics involving the formation, advancement and retreat of a glacier.
32. Describe the possible causes of glacial periods or ice ages, their effect on climate, living things and

the topography of the land.

33. Interpret and identify erosional and depositional glacial features on maps and diagrams.
34. Describe the various periods of glacial and interglacial periods in Michigan using glacial maps.
35. Explain the Milankovitch theory and how it relates to the creation of ice ages on Earth.
36. Identify possible outcomes of ice ages and their effects on humans and the environment.
37. Analyze the effects of salinity and temperature differences on the density of seawater.
38. Understand the physics and generation of waves on water.
39. Identify various forms of beach/coastal destruction and protection.
40. Identify the causes, consequences and possible prevention or detection of natural disasters involving the hydrosphere, including: flooding, sinkholes, tsunamis.
41. Analyze negative human-related affects on the hydrosphere, including contamination and depletion of surface, ground and ocean water.
42. Define the makeup and percentage of gases in the atmosphere.
43. 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.
44. Describe the concerns and causes for ozone depletion.
45. Using a graph, identify how pressure changes with altitude.
46. Compare and contrast the various motions and their effects on the Earth, including rotation, revolution and precession.
47. List the two reasons for the variation in solar energy reaching locations on Earth, causing Earth's seasons.
48. Identify the seasons (in both hemispheres) by date, hours of sunlight received and the axial tilt of the Earth.
49. Define the greenhouse effect, listing the positive and potential negative outcomes of this effect on Earth.
50. Compare and contrast arguments relating to potential causes for climate change, including natural and anthropological causes.
51. State and explain various controls of temperature and how they affect the temperature of various locations around Earth.
52. Using a sling psychrometer, and related charts, calculate relative humidity and dew points.
53. Explain the various processes and heat exchanges involved in the hydrologic cycle.
54. Define and explain the mechanisms creating cloud formation, including the processes of collision-coalescence and the Bergeron Process.
55. State and explain what causes wind using pressure gradient, Coriolis Effect and friction.
56. Identify and label global winds and pressure zones on Earth.
57. Identify symbols, define terms and describe the origin and movement of air masses and fronts.
58. Explain the process of cyclogenesis, or the formation of a mid-latitude cyclone.
59. 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.
60. Research the current Earth Science curriculum standards for the state of Michigan.
61. Create a portfolio of lesson activities based on the current elementary level Earth Science benchmarks for the state of Michigan.
62. Demonstrate and discuss various teaching methods and strategies appropriate for elementary level teaching.
63. Create a bulletin board related to an Earth science topic appropriate for an elementary classroom.
64. Present a lesson activity to a classroom of peers.

New Resources for Course

Course Textbooks/Resources

Textbooks

Thompson, Graham and Turk, Jonathan. *Earth*, 1st ed. Brooks/Cole Cengage Learning, 2011, ISBN:

9780538740999.

Manuals
Periodicals
Software

Equipment/Facilities

Level III classroom
Data projector/computer

<u>Reviewer</u>	<u>Action</u>	<u>Date</u>
Faculty Preparer: <i>Suzanne Albach</i>	<i>Faculty Preparer</i>	<i>Mar 14, 2017</i>
Department Chair/Area Director: <i>Kathleen Butcher</i>	<i>Recommend Approval</i>	<i>Mar 30, 2017</i>
Dean: <i>Kristin Good</i>	<i>Recommend Approval</i>	<i>Mar 31, 2017</i>
Curriculum Committee Chair: <i>David Wooten</i>	<i>Recommend Approval</i>	<i>May 05, 2017</i>
Assessment Committee Chair: <i>Ruth Walsh</i>	<i>Recommend Approval</i>	<i>Jun 01, 2017</i>
Vice President for Instruction: <i>Kimberly Hurns</i>	<i>Approve</i>	<i>Jun 04, 2017</i>