

Montgomery County Community College
GLG 120
Earth Science
4-3-3

COURSE DESCRIPTION:

Earth Science is a general survey course which includes the disciplines of Astronomy, Geology, Meteorology, and Oceanography. Specific topics to be examined include stellar evolution, planetary geology, cosmological theory, erosional and depositional processes, volcanoes, earthquakes, plate tectonics, weather patterns and forecasting. This course is recommended to fulfill a laboratory science requirement for non-science majors who do not have a strong science background. This course is subject to a course fee. Refer to <http://mc3.edu/adm-fin-aid/paying/tuition/course-fees> for current rates.

REQUISITES:

Previous Course Requirements

None

Concurrent Course Requirements

None

| LEARNING OUTCOMES Upon successful completion of this course, the student will be able to: | LEARNING ACTIVITIES | EVALUATION METHODS |
|--|---|---|
| 1. Apply the scientific method of inquiry. | Lecture Small Group Discussion Laboratory Procedures Computer Simulation Computer-Aided Instruction AV/Multimedia Materials Text and Outside Readings Examinations Projects | Laboratory Reports Group and Individual Project Reports Examinations |
| 2. Utilize fundamental astronomical properties in developing a model of stellar evolution. | Lecture Text and Outside Readings AV/Multimedia Materials Group and Individual Projects | Examinations |

| LEARNING OUTCOMES | LEARNING ACTIVITIES | EVALUATION METHODS |
|---|---|--|
| 3. Recognize distinctions among the solar system constituents and account for their differences. | Text and Outside Readings Lecture Group and Individual Projects Lecture AV/Multimedia Materials | Group and Individual Project Reports Examinations Laboratory Reports |
| 4. Relate the circumstances under which severe storms develop. | Text and Outside Readings Computer Simulation Online Datasets Lecture AV/Multimedia Materials | Group and Individual Project Reports Examinations |
| 5. Recognize and apply the phase changes of water in the energy budget of meteorological systems. | Text and Outside Readings Computer Simulation Lecture Lab Procedures Group and Individual Projects AV/Multimedia Materials | Group and Individual Project Reports Laboratory Reports Examinations |
| 6. Relate the primary factors responsible for climate zonation. | Text and Outside Readings Lab Procedures Computer Simulation Lecture AV/Multimedia Materials | Group and Individual Project Reports Laboratory Reports Examinations |
| 7. Recognize important rock-forming minerals in the context of common crustal rocks. | Text and Outside Readings Lab Procedures Group and Individual Projects Lecture AV/Multimedia Materials Field Trips | Group and Individual Project Reports Laboratory Reports Examinations |
| 8. Recognize landforms associated with erosional and depositional processes. | Text and Outside Readings Lab Procedures Group and Individual Projects Lecture AV/Multimedia Materials Field Trips | Laboratory Reports Examinations |

| LEARNING OUTCOMES | LEARNING ACTIVITIES | EVALUATION METHODS |
|---|---|--|
| 9. Describe the energetics of volcanic activity. | Lecture Text and Outside Readings Group and Individual Projects AV/Multimedia Materials | Laboratory Reports Group and Individual Project Reports Examinations |
| 10. Relate the evidence for the plate tectonic model. | Lecture Text and Outside Readings Lab Procedures Online Datasets Group and Individual Projects AV/Multimedia Materials | Group and Individual Project Reports Laboratory Reports Examinations |

At the conclusion of each semester/session, assessment of the learning outcomes will be completed by course faculty using the listed evaluation method(s). Aggregated results will be submitted to the Associate Vice President of Academic Affairs. The benchmark for each learning outcome is that *70% of students will meet or exceed outcome criteria.*

SEQUENCE OF TOPICS:

1. Introductory Material
 - a. Scientific Method
 - b. Parameters and Units
 - c. Atomic Structure
 - d. Electromagnetic Energy
2. Topics of Astronomy
 - a. Characteristics and Parameters of Stars
 - 1) Distance
 - 2) Spectroscopy
 - 3) Motion studies
 - 4) Stellar classification
 - b. Stellar Evolution
 - c. Galaxies and Quasars
 - d. Cosmology
 - e. Solar System
 - f. Lunar Geology
 - g. Astronomic Phenomena
 - 1) Phases
 - 2) Eclipses
 - 3) Tides
 - 4) Seasons

3. Topics of Meteorology
 - a. Composition, Structure, and Evolution of Atmosphere
 - b. Mechanisms of Heat Transfer In Atmosphere
 - c. Water
 - 1) Capacity/saturation
 - 2) Phase changes
 - d. Pressure and Wind
 - e. Mid-Latitude Cyclones
 - f. Severe Storms
4. Topics of Geology
 - a. Common Rock-Forming Silicates
 - b. Weathering
 - c. Mechanisms, Processes, and Environments of Erosion/Transportation/Deposition
 - 1) Landslides
 - 2) Streams
 - 3) Coastlines
 - 4) Carbonate deposition
 - 5) Deep-ocean sedimentation
 - d. Lithification, and Interpretation of Sedimentary Rocks
 - e. Igneous Rocks and Igneous Processes
 - f. Metamorphic Rocks
 - g. Crustal Deformation
 - h. Plate Tectonics
 - i. Geologic Time

LIST OF LABORATORIES -- to be selected by the instructor. Others may be added at the discretion of the instructor:

1. Density Determination and Interpretation
2. Relative and Absolute Dating Lab
3. Observations with Telescopes
4. Humidity – Data Collection and Interpretation
5. Weather Maps – Construction and Interpretation
6. Soil Analysis
7. Stream Modeling with Stream Table
8. Topographic Maps – General Introduction; and Interpretation of Streams, Glaciers, Coastal Processes
9. Common Rock-Forming Silicates and Non-silicates
10. Sedimentary Rocks – Identification and Interpretation
11. Igneous Rocks – Identification and Interpretation
12. Metamorphic Rocks – Identification and Interpretation
13. Interpretation of Earthquake Data; Earthquakes and Earth's Interior
14. Plate Tectonics
15. Crustal Structure – Folds and Faults
16. Mineral Properties & Identification

