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
 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
 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
 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
 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
 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
 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

- 17. Shaping Earth's Surface -- Running Water & Groundwater
- 18. Waves, Currents, & Tides
- 19. Field Observations
- 20. Air Masses
- 21. The Moon and Sun

FIELD TRIPS:

Field trips may be scheduled as part of class time and/or on Saturday.

LEARNING MATERIALS: Tarbuck & Lutgens. (2015). *Earth Science* (14th ed.). Pearson/Prentice Hall. Supplementary Handouts College Computer Network Tutorial Services

Other learning materials may be required and made available directly to the student and/or via the College's Libraries and/or course management system.

COURSE APPROVAL:

Prepared by: Revised by: VPAA/Provost	Robert Kuhlman, Professo Robert Kuhlman, Professo Compliance Verification:	or of Earth Science or of Earth Science Dr. John C. Elvnn, Jr.	Date: Date: Date:	10/28/2004 2/10/2009 9/11/2009
Revised by:	Robert Kuhlman, Professo	or of Geology	Date:	6/2012
Revised by: VPAA/Provost	Robert Kuhlman, Professor of Geology or designee Compliance Verification:		Date:	8/2013
	Victoria L. Bastecki-Perez	, Ed.D.	Date:	9/5/2013
Revised by: VPAA/Provost	Debbie Dalrymple or designee Compliance V	erification:	Date:	6/27/2016
	Victoria L. Bastecki-Perez	, Ed.D.	Date:	6/27/2016
Revised by: VPAA/Provost	Debbie Dalrymple and Eve or designee Compliance V	on Martins erification:	Date: Date:	1/11/2018 1/30/2018

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This course is consistent with Montgomery County Community College's mission. It was developed, approved and will be delivered in full compliance with the policies and procedures established by the College.