Course Syllabus

Course Information

Course Title: General Education Earth Science

Subject and Number: ESC 1000

Course Description: Using the scientific method, critical thinking skills, data analysis, this course will examine the fundamental processes of the earth system, composed of an atmosphere, hydrosphere, lithosphere, biosphere, and exosphere, through time. The course will also explore interactions between these spheres, including critical analysis of scientific theories and emphasize earth's connections with humans. Student learning outcomes: students will use critical thinking to recognize the rigorous standards of scientific theories; students will analyze and synthesize earth science data to draw scientifically valid conclusions; students will recognize the different time scales associated with different earth processes; students will effectively describe interactions between humans and the earth's spheres; and students will apply their understanding of earth science principles to complex global and local issues.

Class Number: LOREM IPSUM

Term and Year: LOREM IPSUM

Course Modality: MDC Modalities

Instructor Information

Name: LOREM IPSUM

Department and Campus: LOREM IPSUM

Office location: LOREM IPSUM

Office hours: *(communicate course office hours with students)*

Phone number: 123-456-7890

Email: LOREM IPSUM

Communication Policy: *(Faculty will establish protocols for communication with students)*

Required Textbook, Course Materials, and Technology

Required course materials: *(Textbook(s), library reserves, shark pack, and/or other required readings. Include ISBN Number and author(s))*

List optional/supplemental materials/OER: LOREM IPSUM

Technology & Technical Skill Requirements: *(Technology tools or equipment students need to complete this course are included)*

Grading Policy & Assessment Methods

List all activities, papers, quizzes, tests, etc. including grading scale used for final grade calculation. Relationships between the final grade and the learner's accumulated points or percentages/weights breakdown for each assessment or component of the course grade.

Include policy on late submissions.

For MDC Live and MDC Online courses, include policy regarding exams (e.g., ProctorU, Respondus Lockdown and Monitor, etc.)

If applicable, include guidelines for extra credit.

Incomplete Grades: View the college's procedures for Incomplete Grades

Miami Dade College Policies

Attendance Policy: *(Faculty include precise statements about illnesses/emergencies/ tardiness, missed assignments/make-up.)*

Students Rights and Responsibilities: *Policies addressing academic integrity and plagiarism, code of conduct, grade appeals, religious observations, services for students with special needs, student complaints, and other.*

For more information, visit the Student's Rights and Responsibilities page

Available Support Services & Resources

- Tutoring Labs and Technology – Learning Resources
- Virtual Tutoring through Learning Resources or Smarthinking Online Tutoring
- ACCESS: A Comprehensive Center for Exceptional Student Services
- Advisement
- Password and Login Technical Support
- Technical Support for MDC Live and MDC Online Courses
- SMART Plan

(Faculty select from the above if applicable and include additional course/campus specific resources)

Available Support Services & Resources

- Public Safety - Services
- Hurricane and Other Natural Disasters: In the event of a hurricane or other disaster, the class follows the schedule established by the College for campus-based courses. Please visit the MDC website or call the MDC Hotline (305-237-7500) for situation updates.

Course Description

ESC1000 | General Education Earth Science | 3 credits

Using the scientific method, critical thinking skills, data analysis, this course will examine the fundamental processes of the earth system, composed of an atmosphere, hydrosphere, lithosphere, biosphere, and exosphere, through time. The course will also explore interactions between these spheres, including critical analysis of scientific theories and emphasize earth's connections with humans. Student learning outcomes: students will use critical thinking to recognize the rigorous standards of scientific theories; students will analyze and synthesize earth science data to draw scientifically valid conclusions; students will recognize the different time scales associated with different earth processes; students will effectively describe interactions between humans and the earth's spheres; and students will apply their understanding of earth science principles to complex global and local issues.

Course Competencies

Competency 1:

The student must show knowledge, comprehension, and application of the historical development of the geological sciences by:

- Identifying and/or define terms and people related to the development of the geological sciences including but not limited to Greek and Roman philosopher/ scientists, catastrophists, the role of the church in western Europe, and recent developments in the development of the geological sciences.
- Identifying and/or define the major principles and laws that form the foundations of geology including but not limited to correlation, faunal succession, cross-cutting relationships, original horizontality, superposition, and uniformitarianism.
- Discussing the relationship between the work that geologist do and our daily lives.
- Defining various terms that are used in dating the earth including relative age dating, absolute age dating, radioactive decay, half- life, atomic number, atomic mass, alpha particle, beta particle, and isotope.
- Explaining how radioactive age dating techniques are used to determine the age of the earth.
- Explaining the limitations of different radioactive dating techniques.
- Reproducing the geologic time scale using both geologic terms and absolute dates.

Learning Outcomes

- Computer / Technology Usage
- Critical thinking
- Cultural / Global Perspective
- Environmental Responsibility
- Information Literacy
- Numbers / Data

Competency 2:

The student must show knowledge, comprehension, and application of using techniques that you have learned in determining a possible sequence of events that could explain how a selected geologic sequence of strata formed by:

- Explaining what discontinuities are and how they form.
- Developing a logical sequence of events that could result in the geologic cross section that you are given.

Learning Outcomes

- Computer / Technology Usage
- Critical thinking
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- Environmental Responsibility
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Competency 3:

The student must show knowledge, comprehension, and application of the different types of minerals as well as the rock cycle and the three major types of rocks by:

- Defining a mineral.
- Explaining how minerals are identified.
- Defining terms that are used in the identification of minerals and specific examples of minerals utilizing these properties including but not limited to luster, hardness, streak, crystal form, cleavage, fracture, Moth's hardness scale, taste, and color.
- Using common everyday items determine a range of hardness for an unknown mineral.
- Comparing and contrasting the 7 different mineral groups.
- Explaining the rock cycle.
- Describing the relationship between texture and the rate of cooling as it relates to igneous rocks.
- Describing how igneous rocks are classified.
- Describing how sedimentary rocks are classified.
- Describing how metamorphic rocks are classified
- Comparing and contrasting clastic and nonelastic sedimentary rocks.
- Comparing and contrasting the different types of nonclastic sedimentary rocks.
- Defining various terms related to the three types of rocks including, but not limited to: metamorphism, igneous texture, evaporite basin, precipitate, mafic, felsic, silicic, intrusive, extrusive, foliated, phyllite, schist, gneiss, porphyritic, contact metamorphism, glassy, oolite, regional metamorphism, organic, salt dome, aphanitic, and cataclastic metamorphism
- Describing the steps involved in the formation of coal.

Learning Outcomes

- Computer / Technology Usage
- Critical thinking
- Cultural / Global Perspective
- Environmental Responsibility
- Information Literacy
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Competency 4:

The student must show knowledge, comprehension, and application of how and why earthquakes occur by:

- Describing the geographic distribution of earthquakes.
- Defining various terms related to earthquakes, including but not limited to: stress, strain, rupture, elastic limit, the zone of plastic flow, the zone of elastic flow, focus, Richter Scale, Modified Mercalli Scale, and epicenter.
- Comparing and contrasting the Modified Mercalli Scale and the Richter Scale.
- Describing how the velocity of different types of seismic waves vary as they travel through the earth.
- Describing how to determine the focus of an earthquake using the data obtained from seismograms.
- Describing what causes deaths when earthquakes occur.
- Describing various ways that scientists are trying to predict earthquakes.
- Explaining a possible way to control earthquakes.
- Describing how buildings might be designed to minimize the effects of earthquakes

Learning Outcomes

- Computer / Technology Usage
- Critical thinking
- Cultural / Global Perspective
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Competency 5:

The student must show knowledge, comprehension, and application of the concept of plate tectonics by:

- Describing the historical development of the concept of plate tectonics.
- Describing the various types of plate boundaries
- Comparing and contrasting different lines of evidence that are used to prove that plate tectonics occurs.

- Defining various terms related to plate tectonics including but not limited to: mid- ocean ridge, central rift valley, tensional forces, convection cell, paleomagnetism, Curie Point, remnant magnetism, magnetic reversal, divergent plate boundaries, convergent plate boundaries, transform fault, hot spot, Ring of Fire, subduction zone, Benioff Zone, and volcanic island arc.

Learning Outcomes

- Computer / Technology Usage
- Critical thinking
- Cultural / Global Perspective
- Environmental Responsibility
- Information Literacy
- Numbers / Data

Competency 6:

The student must show knowledge, comprehension, and application of volcanic action and igneous intrusions by:

- Comparing and contrasting the different types of volcanoes.
- Defining the following terms related to igneous features, including but not limited to volcanism, viscosity, shield volcano, stratovolcano, cinder cone volcano, composite volcano, nuée ardente, lahar, tiltmeter, harmonic seismic waves, laccolith, batholith, stock, and pyroclastic flows.
- Discussing the ways in which geologists try to predict volcanic eruptions.
- Comparing and contrasting concordant and discordant igneous intrusions

Learning Outcomes

- Computer / Technology Usage
- Critical thinking
- Cultural / Global Perspective
- Environmental Responsibility
- Information Literacy
- Numbers / Data

Competency 7:

The student must show knowledge, comprehension, and application of the surface flow of water and groundwater by:

- Discussing the changes that occur in a stream as one travels from its' headwaters to its mouth.
- Defining the following terms related to running water and groundwater, including but not limited to: zone of aeration, zone of saturation, water table, artesian water system, spring, well, velocity, competence, capacity, discharge, stream, river, stalactite, stalagmite, column, and karst topography
- Discussing the stages of stream and valley development.

- Discussing the flow of groundwater and the relationship between the water table and the surface topography.
- Discussing the chemical reactions that occur when groundwater travels through limestone.
- Discussing the geological effects of groundwater.

Learning Outcomes

- Computer / Technology Usage
- Critical thinking
- Cultural / Global Perspective
- Environmental Responsibility
- Information Literacy
- Numbers / Data

Competency 8:

The student must show knowledge, comprehension, and application of the basic principles of oceanography by:

- Discussing the structure and bathymetry of the continental margins as well as the deep ocean basins.
- Comparing and contrasting the types of sediments found on the seafloor.
- Discussing the origin of submarine canyons and atolls.
- Discussing tides.
- Discussing how wave action modifies coastlines.
- Discussing, using specific examples, the movement of sand along a beach and the effects of man's intervention.
- Defining the following terms related to oceanography, including but not limited to: turbidity flow, abyssal plains, deep ocean trench, terrigenous sediment, biogenous sediment, hydrogenous sediment, wave height, wavelength, wave refraction, longshore current, spit, bay mouth bar, wave-cut terrace, groin, and jetty.

Learning Outcomes

- Computer / Technology Usage
- Critical thinking
- Cultural / Global Perspective
- Environmental Responsibility
- Information Literacy
- Numbers / Data