



# BROWARD COMMUNITY COLLEGE COURSE OUTLINE

**LAST REVIEW:** 2010-11      **NEXT REVIEW:** 2015-16      **STATUS:** A

**COURSE TITLE:** Historical Geology Laboratory

**COMMON COURSE NUMBER:** GLY-1100L

**CREDIT HOURS:** 1      **CONTACT HOUR BREAKDOWN**

**CLOCK HOURS:**      Lecture:      Lab: 32  
                                 Clinic:      Other:

**PREREQUISITE(S):** MAT0024 with a grade of “C” or better

**COREQUISITE(S):**

**PRE/COREQUISITE(S):** GLY1100

**COURSE DESCRIPTION:** This course utilizes activities to interpret the earth’s geologic history and augments the topics covered in GLY-1100. These exercises include a review of rocks and minerals, interpretation of maps and aerial photography using principles to determine the sequence geologic events, application of paleontologic data, interpretation of depositional environments, stragraphic correlation, interpreting surface and subsurface structure, and paleogeographic exercises

General Education Requirements – Associate of Arts Degree (AA), meets Area(s): 4C

## **UNIT TITLES**

1. Rocks and Minerals
2. Topographic Maps and Aerial Photography
3. Geologic Event Sequencing
4. Paleontology
5. Rock and Time Unit Correlation
6. Interpretation of Depositional Environments
7. Structural Geology
8. Paleogeography



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## GENERAL EDUCATION Competencies and Skills \*:

In the box to the right of the Competency/Skill, enter all specific **student learning outcome** unit numbers, as indicated in the course outline (i.e. 1.1, 2.7, 4.2, 4.0 and 5.12) that apply.

<b>Course must include <u>all</u> of the following:</b>	
<b>1. Read with critical comprehension**</b>	1.1-1.3, 2.1-2.4, 3.1-3.6, 4.1-4.6, 5.1-5.6, 6.1-6.4, 7.1-7.3, 8.1-8.2 (map and chart reading primarily)
<b>2. Write clearly and coherently**</b>	1.1-1.3, 2.1-2.4, 3.1-3.6, 4.1-4.6, 5.1-5.6, 6.1-6.4, 7.1-7.3, 8.1-8.2
<b>3. Demonstrate literacy as appropriate within a given discipline**</b>	a) 1.1-1.3, 2.1-2.4, 3.1-3.6, 4.1-4.6, 5.1-5.6, 6.1-6.4, 7.1-7.3, 8.1-8.2 e) 2.4, 3.2, 3.3, 3.4, 3.5, 4.5, 5.3, 5.4, 5.5, 7.1, 7.2 f) 1.0 – 8.0
<b>4. Apply problem solving skills or methods to make informed decisions in a variety of contexts**</b>	1.1-1.3, 2.1-2.4, 3.1-3.6, 4.1-4.6, 5.1-5.6, 6.1-6.4, 7.1-7.3, 8.1-8.2
<b>Course must include at least <u>one</u> of the following:</b>	
<b>5. Differentiate between ethical and unethical behavior</b>	
<b>6. Demonstrate an understanding of the physical, biological, and social environments and how individual behaviors impact this complex system.</b>	8.1
<b>7. Demonstrate an understanding of and appreciation for human diversities and commonalities.</b>	
<b>8. Speak and listen effectively.</b>	

*\*General Education Competencies and Skills endorsed by 2010-2011 General Education Task Force*

### \*\*Required Competencies

#### 1) Read with critical comprehension.

The student will be introduced to the basic texts, concepts, vocabulary, and methods necessary for developing an understanding of the discipline and meeting the required benchmarks as stated in the course outline.

#### 2) Write clearly and coherently.

The student will demonstrate an understanding and mastery of subject matter in a variety of ways, including writing. Writing activities may include both graded and ungraded essays, short answer quizzes, summaries, reactions, journals, and various other reports.

#### 3) Demonstrate and apply literacy across all the disciplines (indicate which ones apply).

- a) **Information literacy** means understanding how to locate needed information, using the appropriate technology for the task, managing and evaluating the extracted information and using it effectively and ethically.
- b) **Technology literacy** is the ability to responsibly and effectively use appropriate technology to access, manage, integrate, or create information, and/or use technology to accomplish a given task.
- c) **Workplace literacy** is having the appropriate knowledge and skills to communicate and work with others effectively and perform job duties, whether it is through the use of computers and/or other technology.
- d) **Cultural literacy** is recognizing, understanding, and appreciating the similarities and differences between one's own culture and the cultures of others through a study of the arts, customs, beliefs, values, and history that define a culture.
- e) **Quantitative literacy** is having the ability to formulate, solve and interpret mathematical/statistical operations and graphical/tabular representations to make informed decisions.
- f) **Scientific literacy** means understanding the methodology and application of the scientific process, the physical and biological worlds, and recognizing that scientific knowledge is continuously updated or revised as new information is discovered.



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**g) Environmental literacy** is creating a context within which environmental issues can be viewed, imparting knowledge to enhance one's ability to analyze the issues, make the connections between humans' decisions and actions and the challenges facing the environment, and instilling the desire to sustain the environment through ethical practices in both one's professional and personal lives.

**4. Apply problem-solving skills or methods to make informed decisions in a variety of contexts.**

The student will use acquired skills or methods to recognize, analyze, adapt, and apply critical thinking to solve problems and make informed decisions.



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### EVALUATION:

In the box to the right of the Methods of Assessment, enter all specific learning outcome numbers (i.e. 1.1, 2.7, 4.0, 4.2 and 5.12) that apply.

1. Portfolio	
2. Short essays	
3. Research Papers	
4. Group projects	
5. Discussions (In class and online)	1.1-1.3, 2.1-2.4, 3.1-3.6, 4.1-4.6, 5.1-5.6, 6.1-6.4, 7.1-7.3, 8.1-8.3
6. Multiple Choice tests	
7. Presentations	
8. Service Learning Projects	
9. Quizzes (pop, announced, etc.)	
10. Take-home tests	
11. Summaries, critiques, and analyses	1.1, 1.2, 2.1-2.4, 3.1-3.6, 4.1-4.6, 5.1-5.6, 6.1-6.4, 7.1-7.3, 8.1-8.3
12. Reaction papers	
13. Surveys	
14. Performance	1.1-1.3, 2.1-2.4, 3.1-3.6, 4.1-4.6, 5.1-5.6, 6.1-6.4, 7.1-7.3, 8.1-8.3
15. Short answer tests	1.1-1.3, 2.1-2.4, 3.1-3.6, 4.1-4.6, 5.1-5.6, 6.1-6.4, 7.1-7.3, 8.1-8.3
16. Classroom debates and colloquia	
17. Blogs, wikis, web pages	
18. Other (Please explain) Lab workbook, notebook, manual, or other mode of written recording of results. Maps, graphs, charts.	1.1, 1.2, 2.1-2.4, 3.1-3.6, 4.1-4.6, 5.1-5.6, 6.1-6.4, 7.1-7.3, 8.1-8.3



# BROWARD COMMUNITY COLLEGE COURSE OUTLINE

Common Course Number: GLY-1100L

## UNITS

### Unit 1 Rocks and Minerals

#### General Outcome:

- 1.0 The student shall: be able to identify common rock forming minerals and apply this knowledge to the classification of various rocks.

#### Specific Measurable Learning Outcomes:

Upon successful completion of this unit, the student shall be able to:

- 1.1 Identify and classify rock forming minerals based on their physical properties.
- 1.2 Identify igneous, sedimentary and metamorphic rocks based on their environment of formation, mineralogy and chemistry, and physical properties.
- 1.3 Use published and peer reviewed readings, such as books containing written and photo descriptions of rocks and minerals and basic geology textbooks, to aid in rock and mineral identification and classification
- 1.4 Apply the rock cycle to the 3 basic rock types.



**Unit 2 Topographic Maps and Aerial Photography**

**General Outcome:**

**2.0 The student shall: be able to read topographic maps and aerial photographs to interpret geologic features and geomorphic processes.**

**Specific Measurable Learning Outcomes:**

**Upon successful completion of this unit, the student shall be able to:**

- 2.1 Identify and interpret geologic structures such as folds and faults.**
- 2.2 Interpret geomorphic features such as karsts, stream and glacier features.**
- 2.3 Distinguish contacts between rock units exposed on the surface.**
- 2.4 Calculate elevation and interpret surface structure from a topographic map**



Common Course Number: GLY-1100L

**Unit 3 Geologic Time and Stratigraphy**

**General Outcome:**

- 3.0 The student shall: be able to apply principles of stratigraphy to relative and radiometric dates of geologic events.**

**Specific Measurable Learning Outcomes:**

**Upon successful completion of this unit, the student shall be able to:**

- 3.1 Apply the fundamental principles of relative age dating as a means of interpreting geologic history including:**
- 3.1.1 Principle of superposition**
  - 3.1.2 Principle of original horizontality**
  - 3.1.3 Principle of cross cutting relationships**
  - 3.1.4 Principle of uniformitarianism**
  - 3.1.5 Principle of lateral continuity**
  - 3.1.6 Principle of inclusions.**
  - 3.1.7 Principle of fossil succession**
- 3.2 Apply radioactive age dating principles to calculate the absolute age of rock units.**
- 3.3 Use both absolute and relative age dating methods to determine the sequence of geological events where and when both methods can be used.**
- 3.4 Using the ratio of parent to daughter radioactive isotopes, calculate the age and the number of half lives of a hypothetical sample.**
- 3.5 Use the Geologic Time Scale correctly when interpreting geologic events.**
- 3.6 Utilize geologic block diagrams and maps to determine sequence of events, identify geologic structures, and assist in interpreting the geologic history represented.**



**Unit 4 Paleontology and Biostratigraphy**

**General Outcome:**

- 4.0 The student shall: be able to classify and apply fossils to interpretation of depositional environments and utilize fossils for biostratigraphic purposes.**

**Specific Measurable Learning Outcomes:**

**Upon successful completion of this unit, the student shall be able to:**

- 4.1 Recognize different forms of fossilization such as actual remains, petrification, trace fossils, mold and cast and carbonizations.**
- 4.2 Classify representative examples of fossils from the protists, porifera, archaocyathans, cnidarians, brachiopods, bryozoans, echinoderms, molluscs, arthropods, amphibians, reptiles, birds, and mammals and relate their evolutionary history to the Geologic Time Scale.**
- 4.3 Determine, from a fossil assemblage, the paleo-ecology of the locality.**
- 4.4 Identify index fossil species for every period in the Phanerozoic and every epoch in the Cenozoic and use their ranges to determine relative age dates of geologic sequences.**
- 4.5 Knowing the range of index species, utilize fossil assemblages to determine the age of a rock unit.**
- 4.6 Utilize course assigned readings to aid in fossil identification and classification**



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**Unit 5 Rocks and Time Unit Correlation**

**General Outcome:**

**5.0 The student shall: be able to recognize and correlate rock stratigraphic and time stratigraphic units from geologic data.**

**Specific Measurable Learning Outcomes:**

**Upon successful completion of this unit, the student shall be able to:**

**5.1 Identify and interpret vertical transgressive and regressive rock sequences.**

**5.2 Identify and interpret lateral facies changes.**

**5.3 Correlate lithostratigraphic units across a geologic cross section.**

**5.4 Correlate time stratigraphic units across a geologic cross section.**

**5.5 Read and interpret geologic cross sections.**



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**Unit 6 Interpretation of Depositional Environments**

**General Outcome:**

- 6.0 The student shall: be able to recognize and associate accessory stratigraphic features to interpret depositional settings.**

**Specific Measurable Learning Outcomes:**

**Upon successful completion of this unit, the student shall be able to:**

- 6.1 Identify sedimentary bedding structures and interpret their depositional environment.**
- 6.2 Identify body and trace fossils and associate them with their depositional environments.**
- 6.3 Relate accessory minerals such as glauconite, marcasite, feldspar, and hematite to specific depositional settings.**
- 6.4 Deduce environmental conditions based on sediment characteristics such as mineral composition, fossil content, particle roundness, and grain size analysis.**



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**Unit 7 Interpretation of Structural Geology**

**General Outcome:**

**7.0 The student shall: be able to identify geologic structures such as folds and faults on a geologic map and interpret the geologic history.**

**Specific Measurable Learning Outcomes:**

**Upon successful completion of this unit, the student shall be able to:**

**7.1 Construct a geologic cross section using data typically shown on geologic maps.**

**7.2 Construct a subsurface map of geologic structures using surface mapped geologic information**

**7.3 Interpret the sequence of geologic events from reading a geologic map or cross section.**



**Unit 8 Paleogeography**

**General Outcome:**

- 8.0 The student shall: be able to interpret paleogeographic maps to draw meaningful conclusions regarding the climate of the represented continental configuration.**

**Specific Measurable Learning Outcomes:**

**Upon successful completion of this unit, the students should be able to:**

- 8.1 Identify and discuss possible global climate conditions based on continental configurations for each of the geologic periods.**
- 8.2 Postulate the types of sediments one would expect to have been deposited based on the paleogeography.**