Department of Geosciences
Core Class Assessment 2017-2018
Part 1: General Geology

There are two core lecture classes with accompanying labs in the Geology division of Geosciences. Both fulfill science core requirements in Fulbright College.

General Geology is a 1000-level survey course that is designed to familiarize students with the basic principles of physical geology. Earth Science is a 1000-level that builds on the basic principles covered in General Geology and focuses on the interactions of the atmosphere, hydrosphere, and geosphere and the interactions between humans and the environment.

The class goals are laid out in the syllabi and learning outcomes are assessed through a pre-test, post-test assessment system. Only the aggregate statistics are used in the assessment.

GEOS 1113: General Geology

Course Description and Goals: The primary goal of this course is to introduce undergraduate students to the principles of physical geology, Earth's internal structure and materials, and geologic time. Emphasis is on developing close connections between Earth materials and processes within a Plate Tectonic framework.

Learning Objectives: By the end of the course, students should be able to do the following:

- Classify major rock types and rock-forming minerals
- List the major divisions of geologic time and analyze relationships between rocks to determine their relative ages
- Describe how major landforms are related to geologic processes, especially plate tectonics
- Describe the processes responsible for various geologic hazards
- Interpret 3-D geologic structures from 2-D geologic maps and cross sections
- Distinguish between hypotheses and theories
- Summarize the theory of plate tectonics and the observations that support and led to the development of the theory

GEOS1113 Assessment results 2017-2018

The questions are appended to the end of this report.

GEOS1113 Section 004 – Spring 2018

Question Number	Pre-Test # of Correct Answers	Post-Test # of Correct Answers	Pre-Test % Correct	Post-Test % Correct	Difference
1	110	110	92%	97%	4%
2	32	50	27%	44%	17%
3	27	84	23%	74%	51%
4	30	23	25%	20%	-5%
5	82	88	69%	77%	8%
6	85	95	71%	83%	12%
7	73	82	61%	72%	11%
8	46	57	39%	50%	11%
9	34	63	29%	55%	27%
10	70	78	59%	68%	10%
11	80	94	67%	83%	15%
12	23	29	19%	25%	6%
13	9	58	8%	51%	43%
14	39	89	33%	78%	45%
15	48	56	40%	49%	9%
16	27	35	23%	31%	8%
17	13	68	11%	60%	49%
18	69	77	58%	68%	10%
19	32	32	27%	28%	1%
20	41	43	35%	38%	3%
Number of Students	119	114			

The average score on the Pre-test was 40.8%, while the average score on the Post-test was 57.5%, demonstrating an overall improvement in the level of geologic knowledge of the students. It is clear from the changes in the results from the pre test to the post-test that the students demonstrated clear knowledge increases on the majority of the questions with a 10% or greater increase in the number of correct answers on 12 out of 20 questions. For Questions 1, 4, 5, 12, 15, 16, 19 and 20, the change in student knowledge is negligible, either because the students already knew the material (questions 1 & 5) or these topics may not have received adequate enough coverage during the class to improve their knowledge in these areas (questions 4, 12, 15, 16, 19 & 20). Overall, it appears that the majority of course material is being taught effectively and students are leaving the class with a greater knowledge of physical geology.

On the basis of these results we will consider some minor modifications to the material taught and to the delivery of this material through reading and homework assignments and class lectures .

GEOS1113 General Geology – Core Assessment Test

MULTIPLE CHOICE: Carefully read each question and all possible answers and choose the best answer.

1. The three major classes of rock are known as:
   a. crustal, subcrustal, and transitional b. sedimentary, igneous, and metamorphic
   c. volcanic, plutonic, and transitional d. weathered, eroded, and cemented
   e. big rocks, small rocks, and ugly rocks

2. The most dominant rock associated with our continents is known as:
   a. basalt b. granite c. limestone d. marble e. rhyolite

3. What are the three types of sedimentary rocks?
   a. detrital, chemical, organic b. foliated, nonfoliated, contact
   c. intrusive, extrusive, felsic d. obsidian, basalt, andesite
   e. detrital, organic, porphyritic

4. The most common end product of the chemical weathering of feldspar is:
   a. quartz b. hornblende c. clay d. pyroxene e. calcite

5. The Earth's internal heat engine causes hot rocks in the mantle to _____, whereas colder rocks tend to _____.
   a. contract and rise; expand and sink b. expand and rise; contract and sink
   c. expand and sink; contract and rise d. move laterally; stay stationary
   e. none of the above

6. A _____ is a scientific concept that has been highly tested and is in all likelihood true.
   a. concept b. hypothesis c. theory d. scenario e. belief

7. In order for an aquifer to meet the demands of heavy domestic, industrial, and agricultural water use, it must have:
   a. high porosity b. high permeability c. low porosity
   d. low permeability e. (a) and (b)

8. Fossil evidence indicates that complex life forms developed approximately _____ years before present
   a. 5, 440 b. 544 thousand c. 544 million d. 3.5 billion e. none of the above

9. Which of the following elements is not abundant in the Earth's crust:
   a. oxygen b. uranium c. silicon d. calcium e. aluminum

10. The Earth's lithosphere is comprised of the:
   a. crust b. asthenosphere c. core d. uppermost mantle e. (a) and (d)

11. Earth is unique among terrestrial planets in that it:
    a. has liquid water at its surface
    b. has an atmosphere rich in nitrogen and oxygen
    c. has an active system of (plate) tectonics
    d. supports a biosphere
    e. all of these are unique attributes of Earth

12. A Benioff earthquake zone is significant in plate tectonics theory because it:
    a. locates rift valleys on continents
    b. coincides with mid-oceanic ridges
    c. traces the descent of subducting sea-floor lithospheric slabs
    d. locates major strike-slip faults
    e. indicates the location of magma chambers

13. The majority of time in Earth history is associated with the:
    a. Cenozoic Era b. Paleozoic Era c. Mesozoic Era
    d. Precambrian e. Phanerozoic Eon

14. When a marine geologist collects a core of undeformed ocean-floor sediment, she knows that the youngest layer is on the top of the core and the oldest is at the bottom because of the principle of _____.
    a. supposition b. suspension c. superposition
    d. inclusion e. cross-cutting relationships

15. Slightly acidic ground water can dissolve limestone as it flows along joints and bedding planes to form caves. This reaction may then be reversed as water drips from the ceiling and splashes on the floor of an air-filled cave and minerals are precipitated to form features known as:
    a. stalactites b. stalagmites c. sinkholes d. (a) and (b) e. all of the above

16. The erosional removal of mass from mountainous regions underlain by thick crustal roots or the removal of weight through melting of continental scale ice sheets can result in uplift of the lithosphere. Such vertical movements to achieve gravitational equilibrium between adjacent parts of the Earth's lithosphere are known as:
    a. plate tectonics b. magnetic anomalies c. isostatic adjustments
    d. compressional stresses e. none of the above

17. The inference that the Earth's outer core is liquid comes from
    a. density calculations b. studies of meteorites c. P-wave shadow zones
    d. S-wave shadow zones e. the outer core isn't liquid

18. The principle mineral forming limestone is
    a. quartz b. gypsum c. halite d. calcite e. hematite

19. Eruptions of shield volcanoes fed by mafic magma tend _____.
    a. to be violent and potentially dangerous events
    b. to be explosive but short-lived
    c. not to be explosive or particularly dangerous
    d. to result in the expulsion of vast amounts of tephra
    e. to cover the surrounding landscape in ash

20. Reverse faults are examples of _____ that result from _____ stresses.

a. dip-slip faults, tensional
b. dip-slip faults, compressional
c. strike-slip faults, tensional
d. strike-slip faults, compressional
e. transform faults