

## **UR GEOLOGY: Modified ASBOG Final Exam**

**14% of your GEL4970 Grade**

**ASBOG** ([Association of State Boards of Geology](#)) administers a standardized assessment for professional licensure as a Geologists required in many States to legally practice the profession. While Colorado and New Mexico do NOT require this State Board exam to practice geology, 32 States do, which includes our nearest neighboring States of AZ, KS, NE, UT, and WY. There are two exams given, The **FG or Fundamentals of Geology Examination** required for all “new” graduates coming into the profession and the **PG or Practice of Geology Examination** which is usually administered later in the career probing practical geoscientific applications.

The Fundamentals of Geology Examination is a requirement for a person to become a Licensed Professional Geologist (P.G.) and to offer geologic services to the public in States that register geologists by examination. Some universities now require the FG ASBOG examination as part of the undergraduate degree completion in geology. While MSU Denver does NOT require passing the actual FG exam for graduation, we do now require for you to take our modified ASBOG FG exam as part of the GEL4970 Undergraduate Research Senior Experience course. We call it a modified ASBOG exam to distinguish it from the certified ASBOG exams officially administered. Results will help you gauge your current REQUIRED knowledge in geology and help you identify weaknesses where it might behoove you to take additional courses not necessarily part of your degree plan in order to appropriately expand your knowledge.

Note: Many of our geology alumni have reported that it is best to register and take the ACTUAL FG exam soon after graduation, while much of the geologic knowledge is fresh in your mind. However, it goes without saying that intently studying for the actual exam, even topics you are unfamiliar with is IMPERATIVE to successfully pass the examination. Several weeks of preparation / studying before the examination is the norm.

### **Scope of the ASBOG FG Examination**

The **actual Fundamentals of Geology (FG) exam** is a proctored closed book / notes exam and consists of 140 multiple-choice questions with a time limit of 4 hours (240 minutes). This gives you a little under 2 minutes per question! The test is split into eight sections covering approximately the indicated percentages of topics:

- General and Field Geology (21%)
- Mineralogy, Petrology, and Geochemistry (11%)
- Sedimentology, Stratigraphy, and Paleontology (12%)
- Geomorphology, Surficial Processes, and Quaternary Geology (13%)
- Structure, Tectonics, and Seismology (11%)
- Hydrogeology (12%)
- Engineering Geology (11%)
- Economic Resources Geology (9%)

If you are in your senior year and have taken our core and elective GEL courses here at MSU Denver, you will have covered a great majority of these topics. Nevertheless, you probably will need to brush up on familiar and unfamiliar topics alike.

## Scope of our modified ASBOG FG Examination

Obviously, we will not test you to the same extent during our **modified FG ASBOG Examination** in GEL4790. However, we attempt to cover similar topics and indicated percentages using an equivalent proctored closed book / notes multiple choice format but adjusted for our shorter Final Exam time slot.

Our **modified Fundamentals of Geology (FG) exam** consists of 70 multiple-choice questions and has a time limit of 2 hours (120 minutes) to fit into our MSU Denver Final Exam time slot for GEL4970. This gives you about the same time per question as you would have with the actual FG exam, a little under 2 minutes per question! The test is also split into eight sections covering approximately the indicated percentages of topics which relates to the listed number of questions you can expect:

General and Field Geology	21 %	15 Questions
Mineralogy, Petrology, and Geochemistry	11%	8 Questions
Sedimentology, Stratigraphy, and Paleontology	12%	8 Questions
Geomorphology, Surficial Processes, and Quaternary Geology	13%	9 Questions
Structure, Tectonics, and Seismology	11%	8 Questions
Hydrogeology	12%	8 Questions
Engineering Geology	11%	8 Questions
Economic Resources Geology	9%	6 Questions

**Typical Question Format:** All Multiple Choice with 4 to 5 Answer Choices

Typical Sample Questions from the actual FG State board ASBOG exam:

In an eolian sand aquifer, hydraulic conductivity would be expected to generally:

- A) increase upward
- B) increase downward
- C) be uniform
- D) be lowest in the middle of the unit

A stream crosses a strike-slip fault with no deviation in its course. Which of the following statements must be true?

- A) The fault is active.
- B) The stream crossed the fault since the last fault movement.
- C) Strike-slip faults do not affect stream course.
- D) Rock units are the same on both sides of the fault.

The horizontal scale of a cross-section is 1:24,000; the vertical scale is 1 inch equals 1000 feet. The vertical exaggeration is:

- A) 2x
- B) 12x
- C) 24x
- D) 0.5x

Answers, in case you are wondering: (see end of document)

Some questions will have graphics, some have math, others are word problems or contain narratives.

## How to best prepare for the GEL4970 modified ASBOG FG exam?

It is important to remember that our modified ASBOG FG Exam is NOT a course test, but examines your knowledge acquired through our Applied Geology program and other geoscience related venues. Therefore, it covers ALL classes you have taken and those you should have taken in the Applied Geology Program as well as topics you should have learned in field trips, conferences, clubs and similar.

Where to start to prepare? Peruse your NOTES, Textbooks, Lab manuals, assignments from the various GEL and related classes you will have taken over the years. Yup, hopefully you didn't throw anything away. Indeed, others who have taken the ASBOG examinations say that class NOTES were one of the most valuable resources, together with old assignments and tests.

Here are areas to study / brush up for each of the topics, adapted to address our modified FG ASBOG exam for this class:

### General and Field Geology (21%)

*Surface and subsurface exploration techniques and interpretations; Geologic and geophysical tools, application, and interpretation; Earth processes; Surface and subsurface mapping and map applications; Geologic section construction; Photogrammetry, terrain measurement, GPS, and GIS; Remote sensing; Image analysis and interpretation; Scale and scale analysis; Measurement theory, accuracy and precision; Geostatistics; Documentation and record keeping; Modeling concepts;*

### Mineralogy, Petrology, and Geochemistry (11%)

*Rock and mineral identification; Crystal symmetry, systems, and forms; Igneous rocks and processes; Sedimentary rocks and processes; Metamorphic rocks and processes; Geochemical reactions and diagenesis;*

### Sedimentology, Stratigraphy, and Paleontology (12%)

*Stratigraphic principles; Weathering, erosion, transport, and deposition; Depositional environments; Facies analysis; Basin analysis; Sedimentary structures; Diagenesis; Geologic time; Geochronology; Fossil record and evolution;*

### Geomorphology, Surficial Processes, and Quaternary Geology (13%)

*Geomorphic processes; Landform analysis techniques; Sea and lake level change; Glaciation; Weathering; Sediment transport; Groundwater and surface water; Low temperature geochemistry; Human-land interaction; Soil development and classification; Remote sensing; GIS;*

### Structure, Tectonics, and Seismology (11%)

*Fractures, faults, and folds; Rock fabric; Rock mechanics; Structural analysis; Plate tectonics; Tectonic regimes; Volcanism; Structural and seismic history; Paleoseismology; Earthquake processes;*

### Hydrogeology (12%)

*Groundwater and surface water systems and processes; Aquifer characterization; Hydrogeologic modeling; Low temperature aqueous geochemistry; Contaminant transport and geochemistry; Isotopic and tracer studies; Hydraulic properties of fluids and earth materials; Site investigation methods, tools, and applications; Geophysical techniques; Landform analysis; Weathering;*

### Engineering Geology (11%)

*Landform analysis techniques; Soil and rock weathering; Groundwater and surface water systems and processes; Low temperature geochemistry; Human-land interaction; Soil and rock mechanics; Soil and rock classification and engineering properties; Geologic hazards; Hazard and risk analyses; Cost/benefit analyses; Site investigation methods, tools, and applications; Geophysical techniques;*

### Economic Resources Geology (9%)

*Exploration and development techniques; Geophysical techniques; Petrophysical techniques; Geochemical analysis; Geostatistical analysis; Mineralization processes; Characteristics of mineral deposits; Energy resource systems; Characteristics of hydrocarbon traps; Industrial minerals, coal, and earth materials; Exploration risk and economics; Resource/reserve assessment; Safety hazards and risk analysis;*

## ASBOG Exam Preparation

There are online resources and practice tests available for you to study and prepare for the exam, both the actual and our modified version. Unfortunately, many of those are education businesses and charge a pretty penny for their study material. Of course, you are free to purchase these aids, but it is not a course requirement. Here are a few resources you may try. Hopefully these are helpful.

1. FREE - The official ASBOG candidate handbook with sample questions and answer keys:  
<https://asbog.org/candidates/ASBOG-Candidate%20Handbook-09062023.pdf>
2. FREE - Mometrix FREE ASBOG Practice Test:  
<https://academy-pq.app.mometrix.com/practicequestion/products/ASBOG>
3. FREE - Quizlet ASBOG e-Flash Cards & Practice Exam:  
<https://quizlet.com/316404141/asbog-practice-exam-1-flash-cards/>
4. FREE - Practice Test Geeks: FREE Practice Test and selected FREE topical study guides:  
<https://practicetestgeeks.com/asbog-exam/>
5. \$\$ (~\$50) - Mometrix ASBOG Study Guide: <https://www.mometrix.com/studyguides/asbog/>
6. \$\$ (~\$50) - Mometrix ASBOG Exam Flash Cards: <https://www.flashcardsecrets.com/asbog/>
7. \$\$\$ (~\$30 - \$300) - REG VIEW ASBOG Study Manuals and Flash Cards:  
<https://regreview.com/studyaids/2020onlineorderform.asp>

Another valuable preparation aid are **study groups**. Make it a habit to come together regularly (weekly) long before the exam to go over material learned in your various classes.

## Modified ASBOG FG Exam Execution

The Exam is our Final either taken during finals week or shortly before. It will be administered electronically through the CANVAS platform alas in a proctored environment, not unlike the actual test. We will most likely use one of our computer rooms, unless everyone in the course is able to bring their own device (e.g., laptop, tablet, etc.) for electronic test taking to our regular classroom. If a computer room is used, please login to your CANVAS page BEFOREHAND so we do not have undo technical issues on test day.

The test will only be open and available in CANVAS for the few hours of the scheduled exam time. Otherwise, the exam is locked during the semester. The test is a **closed notes / book exam**, can only be taken ONCE and has a 2-hour (120 minute) time limit.

It is recommended that you bring a calculator to the exam, but **NO cell phones are allowed**. Also, blank scratch paper and a pencil can be used during the exam. Your scratch paper, used or unused, must be relinquished after the test.