جامعة الملك فهد للبترول والمعادن
King Fahd University of Petroleum & Minerals

GEOL 102

Principles of Geology

Fall 2021

211-GEOL 102

Instructor:	Dr. John D. Humphrey – Building 76, Room 2248
Contact information:	humphrey@kfupm.edu.sa
Office hours:	Mon 11-12 AM, Mon 2-3 PM, Wed 2-4 PM
	or by appointment, or drop by
Class:	
Class meeting days/times:	Sunday & Tuesday, 10:00 - 10:50 AM, or 11:00 – 11:50
Class meeting location:	Building 78 Auditorium
Web Page/Blackboard link:	Check Blackboard regularly!

Please note: Laboratory GEOL 103 must be concurrently taken by GEOL, GEOP, CE, ACE majors only

Instructional activity: 2 hours lecture; 2 semester credit hours

Course description: Introduction to the fundamentals of physical geology. Composition and structure of the Earth, mineral and rock identification, plate tectonics, mountain building, geological structures, earthquakes, volcanism, erosion, and sedimentation processes.

Textbook and/or other requirement materials:

Required course textbook: *Tarbuck, Lutgens, and Tasa – Earth: An Introduction to Physical Geology, 12th edition*

Other required supplemental information: As assigned

Student learning outcomes: At the conclusion of the class, students will be able to…

Recognize the enormity of geologic time (deep time) and rates of geologic processes

Identify components (spheres) of the Earth system and how they interact, recognizing that many Earth processes are cyclical in nature

Interpret critical data on the origin of the Solar System and the Earth; explain how the composition and structure of the interior of the Earth are known

Define what a mineral is, and recognize the atomic theory of bonding that produces mineral composition, structure, and physical properties

Summarize evidence for plate tectonics and how the theory is used to predict and explain geologic phenomena on a broad scale

Recognize and describe igneous, sedimentary, and metamorphic rocks. Summarize the geological conditions under which these rock types are formed and where they occur

Recognize and describe principles of stratigraphy and their role in identifying relative timing of geological events

Interpret examples of deformation of rocks in the Earth's crust and the forces/conditions under which these deformations occur

Summarize Earth's hydrocarbon resources, including conventional and unconventional oil and gas.

Identify the scientific evidence for changing Earth climate at a variety of geological time scales and factors that control variations in the climate system through time

Relate to the overall desired outcome of students being scientifically curious and to feeding their wonder over the beauty and complexity of the natural world, as well as for preparation for higher-level Earth-science courses

Brief list of topics covered:

Introduction to the Science of Geology, Geologic Time, and Earth Systems
Origin of the Earth and Solar System
Plate Tectonic Theory
Minerals – The Building Blocks of Rocks
Igneous Rocks – Intrusions and Volcanism
Weathering and Soil Formation
Sedimentary Rocks – Clastic and Chemical
Relative Geologic Time – Principles of Stratigraphy
Crustal Deformation and Structural Geology
Geology of Petroleum Accumulations
Global Wind Patterns and Climate Change

Policy on academic integrity/misconduct:

KFUPM affirms the principle that all individuals associated with the academic community have a responsibility for establishing, maintaining and fostering an understanding and appreciation for academic integrity. In broad terms, this implies protecting the environment of mutual trust within which scholarly exchange occurs, supporting the ability of the faculty to fairly and effectively evaluate every student's academic achievements, and giving credence to the university's educational mission, its scholarly objectives and the substance of the degrees it awards. The protection of academic integrity requires there to be clear and consistent standards, as well as confrontation and sanctions when individuals violate those standards. KFUPM desires an environment free of any and all forms of academic misconduct and expects students to act with integrity at all times.

Academic misconduct is the intentional act of fraud, in which an individual seeks to claim credit for the work and efforts of another without authorization, or uses unauthorized materials or fabricated information in any academic exercise. Student academic misconduct arises when a student violates the principle of academic integrity. Such behavior erodes mutual trust, distorts the fair evaluation of academic achievements, violates the ethical code of behavior upon which education and scholarship rest, and undermines the credibility of the university. Because of the serious institutional and individual ramifications, student misconduct arising from violations of academic integrity is not tolerated at KFUPM. If a student is found to have engaged in such misconduct sanctions such as change of a grade, loss of institutional privileges, or academic suspension or dismissal may be imposed.

I take this seriously. Do not even try.

Grading Procedures: **NOTE – GEOL, GEOP, CE, and ACE majors must be enrolled in both 102 & 103**

Course evaluation will be based on exams, quizzes, attendance, and the laboratory. There will be three (3) major exams, with the third being the final exam. Note that the final exam is *not* cumulative. Weightings are as follows.

GEOL 102 – Term 202	
Exam 1	30%
Exam 2	30%
Final exam	30%
Quizzes (2)	10%

Earned grades: A+ - 95-100 A – 90-94.9%; B+ – 85-89.9%; B – 80-84.9%; C+ – 75-79.9%; C – 70-74-9%; D+ – 65-69.9%; D – 60-64.9%; F – less than 60%. I generally curve the final total grade to result in a class average in the B/B+ range.

Grading Return Policy: *In good faith, most work will be graded and posted within four days.*

Attendance/Absence Policy: You will be expected to **attend every lecture**, and you will most likely perform well in this course if you do attend. I can fairly guarantee that *you will not do well* if you don't come to class. Attendance will be taken periodically through Blackboard. COME TO EVERY CLASS!!

TENTATIVE SYLLABUS

Week of		Topic	TLT Chpt.
Aug.	29	Introduction to Geology, Deep Time, Earth System Components	1
Sept.	5	Origin of the Earth and its Internal Structure	1, 12
	12	Plate Tectonics	2, 13
	19	Plate Tectonics	2, 13
	26	Minerals	3
		First Exam – Saturday, October 2, 5:45 PM	
Oct.	3	Minerals, The Rock Cycle	3
	10	Igneous Rocks	2, 4
	17	Sunday, October 17 – Student Break Day (no class)	
	17	Weathering and Soils	6
	24	Sedimentary Rocks	7
	31	Sedimentary Rocks and Fossils	7
		Second Exam – Saturday, November 6, 5:45 PM	
Nov.	7	Relative Geologic Time	9
	14	Stratigraphic Principles	9
	21	Crustal Deformation and Rock Structures	10, 14
	28	Fall Break – No classes this week	
Dec.	5	Geology of Petroleum	23.2
	12	Global Winds and Climate Change	21
	19	Sunday, December 19, Last Day of Class	
Dec/Jan TBA		**Final Examination** (not cumulative) – per Registrar's Schedule	