

# Geologic Resources: Metals, Energy, Water

University of Texas at El Paso  
Online Lectures, Synchronous

Spring 2021 • GEOL 4315-5315  
Tue/Thu 3-4:20 PM

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## Course Goals and Objectives

This course will provide an overview of the three primary geologic resources: mineral, energy, and water. Processes responsible for resource accumulation and redistribution, the role of geologists in exploration and extraction, and basic working principles of resource evaluation will be covered. The course will answer questions on metals, energy and water resources, such as: Where do they come from? How do they concentrate? How do we find, extract and use them?

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## Learning outcomes

Among other outcomes, at the end of the course students will: be able to

- Describe concepts of geologic resource assessment
- Explain geologic resource consumption rates and current lifetimes
- Define critical minerals and their uses
- Recognize major classes of mineral deposits and their genesis
- Explain the role that fluids play in deposit development and redistribution
- Describe the role that geologists play in exploration, development, and extraction
- List major elements of a hydrocarbon play
- Understand how geologic energy resources are formed (hydrocarbon, uranium, and geothermal)
- Conceptualize mining of water in arid regions
- Understand linkages between energy, mineral, and water resources

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## Textbook / Zoom / Blackboard

### 'Earth's Natural Resources'

By John V. Walther (ISBN: 978-1-4496-3234-2). Published by Jones and Bartlett Learning ([www.jblearning.com](http://www.jblearning.com))

**Recommended, not required.**

**Use code UTEPGEOL for 40% off price and free shipping.**

The book is also offered on eBook through VitalSource:

<https://www.vitalsource.com/products/earth-39-s-natural-resources-john-v-walther-v9781284084931>

**Zoom / Blackboard** Lectures in Zoom will be uploaded to Blackboard after each class. Assignments and class messages will be announced in Blackboard.

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## Grading

Grades will be calculated through a combination of (details to be announced):

- Attendance to online lectures
- Assignments
- Four midterm exams and one final exam (see schedule)

Letter grade: A = 90-100, B=80 – 89.9, C = 70-79.9, D = 60-69.9, F = less than 60

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## CASS / Student Concerns

If you have a disability or if you are experiencing learning disabilities and need classroom accommodations, please contact the Center for Accommodations and Support Services (CASS) at 747-5148, or by email to [cass@utep.edu](mailto:cass@utep.edu), or visit their office located in UTEP Union East, Rm 106. For additional information, please visit [www.sa.utep.edu/cass](http://www.sa.utep.edu/cass).

If you are struggling with this class or experiencing difficulties at the university, please reach out to your instructor or teaching assistant. If they are unable to help you, then please contact the Dean of Students Office at [DOS@utep.edu](mailto:DOS@utep.edu) or phone (915) 747-5648.

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## Academic Misconduct

Academic dishonesty will be not tolerated in this class (please refer to the student conduct code handbook for details regarding university policy and definitions). Dishonesty includes, but is not limited to, plagiarism on term papers, unauthorized notes brought into an exam; copying answers from another student or letting another student copy your answers. The penalty for the first offense will be a grade of zero points on the exam or assignment. Penalty for the second offense will be an F for the course.

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## Helpful Hints

- Attend the lectures!
  - Review material regularly - multiple short study sessions over a period of weeks are more effective than a single "cram" the night before an exam.
  - Form a study group. Each member should study material on their own before meeting with the group for discussion and comparison.
  - Ask questions if you don't know or are confused.
  - Combine class notes, textbook, and web materials when studying. Each provides a different perspective.
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**Schedule:****Weeks 1 to 8 (Prof. Arribas), 10 to 16 (Prof. Engle)**

<b>Week</b>	<b>Date</b>	<b>Topic</b>	<b>Exams</b>
1	Jan. 19, 21	Intro	
2	Jan. 26, 28	Geology Basics	
3	Feb. 2, 4	Geology Basics	
4	Feb. 9, 11	Minerals Deposits I	Exam 1 (2/11)
5	Feb. 16, 18	Minerals Deposits II	
6	Feb. 23, 25	Minerals Deposits III	
7	Mar. 2, 4	Mineral Deposits IV	
8	Mar. 9, 11	Mineral Deposits V	Exam 2 (3/11)
9	<b>Mar. 16, 18</b>	<b>Spring Break</b>	
10	Mar. 23, 25	U.S. and World Energy Use	
11	Mar. 30, Apr. 1	Conventional Hydrocarbons	
12	Apr. 6, 8	Tight Oil and Shale Gas	
13	Apr. 13, 15	Non-hydrocarbon Energy Resources	Exam 3 (4/15)
14	Apr. 20, 22	Intro to Water Resources	
15	Apr. 27, 29	Water availability and quality	
16	May 4, 6	Water use for Energy and Minerals	Exam 4 (5/6)
17	May 13		<b>Comprehensive Final Exam</b>