

Economic Geology

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Course Objectives: All metals, many raw chemicals, and other materials in our daily lives, including glass, ceramic, aggregate, and cement, are won from the earth by mining mineral deposits. Economic geology is the study of how these mineral deposits form within the earth and how we explore for them. This course in economic geology will investigate both the processes that form mineral deposits, as well as practical exploration strategies currently used in industry.

Specifically, you should be able to:

- Identify the major economic minerals in hand specimen
- Identify the major styles of hydrothermal alteration in hand specimen
- Explain the fundamental physiochemical mechanisms for mineral precipitation
- Interpret hydrothermal alteration features in terms of genetic origin of the mineral deposit and spatial location within a mineralizing system
- Calculate the fundamental economics of a potential orebody
- Develop an exploration strategy based on the geology of a target region

Textbooks: Robb (2005)¹ is the most recent and process-focused introductory-level ore deposits book available. If you plan on pursuing ore deposits as a career, I would also recommend the state-of-the-art Hedenquist et al. (2005)² plus membership in an appropriate geological society that would give you access to journals, newsletters, etc.

¹ Robb, Lawrence, 2005, *Introduction to Ore-Forming Processes*: Blackwell Science Ltd., 373 pp. ISBN-13: 978-0632063789

² Hedenquist, Jeffrey W., Thompson, John F. H., Goldfarb, Richard J., and Richards, Jeremy P., Editors, 2005, *Economic Geology 100th Anniversary Volume 1905-2005*: Society of Economic Geologists, 1146 pp. ISBN: 978-1-887483-01-8

Scientific literature: Because keeping up with the scientific literature is such an integral part of being a professional. I will assign readings of recently published journal articles to supplement your textbook readings.

Prerequisite: You must have completed and passed GEL100 - Physical Geology - to qualify to take this course. If you have not done so, please drop this course ***NOW!***

Attendance/late policy: Lecture attendance is *strongly* recommended, but you don't need to be told that. Lab/fieldtrip attendance is *required*. Students who miss lectures and/or labs will be at a serious disadvantage. Make-up exams will be given only by prior arrangement or in the case of genuine emergencies. Lab quizzes cannot be made up (although the *single* lowest grade will be dropped). Labs and homework assignments will be accepted late *only* by prior arrangement or by special announcement.

Honor code: Strict accordance with the University policies concerning plagiarism, cheating, etc. is expected. This does not preclude discussing homework, lab assignments, and research projects with each other; however, you are responsible for your own answers - after all, this is *your* education!

Hand lens: You will need your hand lens, swivel magnet, and hardness probes in almost every lab exercise, in several lectures, and for lab exams.

BE VERY CAREFUL TO ALWAYS BRING YOUR HAND LENS, ETC. TO LAB AND FIELDTRIPS. You will not be allowed to participate without one.

Field trips: *Fieldtrip attendance in this course is absolutely mandatory!!!*

Field trips are important in this class for several reasons: 1) it is important for the learning process to apply what you learn to real-life situations, and 2) sharing field experiences with your classmates will help you develop as friends and professional colleagues.

Grading/Feedback: I need to be able to evaluate how well you've learned the material in this course. Because geology is such a "hands-on" science, lab work and assignments will be important. The purpose of the assignments and labs is to help you build a *personal* understanding of the facts and concepts. The purpose of the three term papers and term poster are to help you build additional expertise in the geology of specific deposits in which you are most likely to work.

Because this course is an opportunity for you to develop your own understanding of geology, rather than an intellectual competition between you and your peers, THERE WILL BE NO CURVING OF GRADES. Your letter grade in this class is independent of the performance of your peers. This means that *it's possible for everyone in the class to achieve A's (and I'd really like to see that happen!!)*, so it is to your benefit to study ardently and do your own work, but also to help each other out.

Your final grade will be determined based on your total points as follows		points	% of class
	Labs (10)	250	21%
	Saturday Fieldtrips (1)	50	4%
A = 90-100%	Mineral Deposit Summaries (2)	50	4%
B = 80-89%	Term papers (3)	300	25%
C = 70-79%	Term paper poster (1)	100	8%
D = 60-69%	Exams (3)	450	38%
F = 0-59%		1200	100%

Special needs: If you have special needs that you feel will affect your participation in this class (e.g., hearing impairment), please provide official documentation of this so we can try to make accommodations to optimize your learning experience.