

# SCHEDULE FOR GEOS 332 "ORE DEPOSITS & STRUCTURE" Spring 2006

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Class: Lecture: Monday 5:30→ ca. 6:30 room 236 lab: M 6:40→ ~9 pm , Weds ~5:30→ 9:30 pm room 236

This room is also available for working in during most evenings and weekends

LABS are assigned on Monday and are **due on the following Monday**. Grossly late labs may be penalized

➔**NEEDED FOR CLASS: 1. hand lens (will supply cheapo) 2. protractor/ruler 3. knife 4. pencil**

DATE	LECTURE TOPIC	READING <sup>1</sup>	LAB TOPIC
1/23	1. Overview of concepts, objectives, definitions of ore deposits. Review of major rock types & minerals	16-24, 99-103	1. Review of rock types & ore mineralogy; simple geologic x-sections
1/30	2. Example of deposit models: placers & paleoplacers	36-8; 244-52	2. Placers, paleoplacers, and non-placers
2/6	3. basic geologic map interpretation—folds, faults, etc.	handout	3. Use of maps and x-sections
2/13	13. Magmatic Oxide deposits	128-138	13. Magmatic OXIDE deposits
2/20	5. Intersecting lines & planes, faults, thickness & depth; cross-sections	26-29; TBA	3. thickness, depth, intersections, cross-sections
2/27	14. Magmatic Sulfide deposits	139-156	14. Magmatic SULFIDE deposits
3/6	4. Intro to plutonic-hydrothermal ores:alt'n & Cu-Mo ore	170-188	4. Intro to porphyry Cu-Mo deposits
<b>SPRING BREAK</b>		<b>3/14- 3/20</b>	
3/20	6. Variations in & variability of porphyry-type deposits	154-6;219-21	6. Sn-W greisen and plutonic Au deposits
3/27	7. Variations in—and exploration for--skarn deposits	157-170	7. Skarns: Sn, W, Cu, Pb-Zn, Fe, & Au
4/3	9. Multiple sources and origins of veins, esp. Au veins	213-220	9. Metamorphic & pluton-related vein deposits
4/10	10. Epithermal deposits: general notions and variations	221-229	10. epithermal precious metal deposits
4/17	11. Submarine volcanogenic massive sulfide deposits	202-10,305-10	11. VMS and related deposits
4/24	12. Syn-sedimentary/diagenetic deposits	233-43,190-202	12. Shale hosted Pb-Zn; Miss. Val type
5/1	8. Drill hole logging		8. Drill hole logging

**FIELD TRIP—Friday, April 28 (Nookie Spring fest)??**

\*Modifications may be made during the semester as required to best serve the needs of students in this class.

**TAKE-HOME FINAL EXAM DUE MONDAY 15 MAY 2005**

<sup>1</sup>Textbook: Evans, Ore Geology & Industrial Minerals, 3rd Ed + other readings to be assigned

**Course Description:** Distribution and characteristics (especially mineralogy, morphology, and structure) of major mineral deposit types with background on structural techniques. Emphasis on application to mineral exploration and development. Laboratory exercises stress recognition of major mineral deposit types, zoning, and grade patterns; and use of structural techniques in mineral deposit exploration and development.

**Student Learning Outcomes:** By actively participating in this course you will become proficient at

1. Identifying common ore and alteration minerals and rock types;
2. Recognizing major ore deposit types from hand specimen, map, and outcrop characteristics
3. Recognizing simple geological structures from map data
4. Solving simple structural problems (e.g., fault offset, unit strike & dip, unit thickness) from map data; and
5. Understanding the importance and limitations of models in mineral deposit exploration and development

**Instructional Methods:** Weekly reading assignments will be made to accompany the lectures. These will be of some help in working on the lab exercises. Lab exercises are given out on Monday and are due the following SATURDAY NIGHT (6 days later). They will be graded on Sunday and returned to you on Monday evening with some oral feedback. It is vital to complete the weekly lab exercises, as it is essentially impossible to learn the course material without doing so. **It is virtually impossible to catch up if you fall behind in the labs!!!** And since the course topics are broadly cumulative, lack of understanding of one topic will make it very difficult to progress to the next.

**Course Policies:** Naturally, I would like you to attend class and to show up on time. If you know you will miss a class let me know and I will give or email you the lecture notes associated lab exercise. *As routine completion of laboratory exercises is essential to understanding the material in this course, I will submit an instructor-designated drop if you are missing more than 2 lab assignments at the 5<sup>th</sup> week or 9<sup>th</sup> week of classes.* **Evan and I encourage students to work together—but we also insist that everyone in the class does his/her own work.**

**Evaluation:** There will be a take-home mid-term exam and a final exam. The final exam is described in greater detail at the end of this document. I reserve the right to dock points for severely late labs.

Student grades in the class reflect the degree to which student learning outcomes have been achieved. Overall class grade based on:

**Weekly lab write-ups: 60%, mid term exam: 20%, final exam: 20%.**

Final grades will be normalized to the highest point total among students in the class. A point total within 90% of this will be an 'A'; within 80% = 'B'; within 70% = 'C', within 60% = 'D', < 60% = 'F'.

**Support Services:** To be honest, there really aren't any that will particularly help you with this class.

**Disabilities Services:** The Office of Disability Services implements the Americans with Disabilities Act (ADA), and insures that UAF students have equal access to the campus and course materials. UAF is committed to equal opportunity for all students. If you have a documented disability, please let me know within the first two weeks of class, and I will work with the Office of Disabilities Services to make the appropriate accommodation. If you have a specific undocumented physical, psychiatric or learning disability, you will benefit greatly by providing documentation of your disability to Disability Services in the Center for Health and Counseling, 474-7043, TTY 474-7045.

## **GEOS 332 SPRING 2005 TAKE-HOME FINAL EXAM DIRECTIONS DUE ON MONDAY, MAY 15**

Write a several page essay (typed) concerning two of the deposits/deposit types we visit on our all-day field trip. Start by describing the characteristics of each & then briefly compare & contrast them.

Characteristics you should consider include: what is the ore?; what are the ore minerals? what are associated ore minerals/elements? what are the gangue and alteration minerals? how is the ore distributed, on both the detailed (hand specimen and finer) and broad (ore deposit) scale? what is the zoning of ore and ore elements? what is the zoning of the alteration? What observable characteristics are used to say a given rock is likely to be ore? (e.g., alteration, texture, mineralogy...)

What is the best estimate of the age of the deposit? What is the origin (as best known today) of the deposit? What 'type' (model) best fits each deposit?

What is the role of the mine geologist in the mining operation? How (in a general way) is the ore separated and concentrated? What is done with the waste and the tailings?

What procedures/techniques were employed to find the deposit in the first place? How does mine-scale exploration take place? How can one use knowledge of this deposit to explore for other or similar deposits in the general area?

You don't need to address all these questions and related issues can be tackled instead, but the key is to show me that you've learned something from the class, both in terms of the information you present and the manner that you discuss it.