

# GEOL 477/677 – Ore Deposit Geology Spring 2019

**Faculty:** Dr. Simon Jowitt  
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**Office Hours:** Tuesday 10.30-11.30, Wednesday 9-10.30

**Course Format:** Lecture twice a week **Tuesday, Thursday, 8.30-9.45 am**  
Lab session once a week, **Friday, LFG201A, 11.30 am to 2.15 pm (see timetable and notes on labs below)**

**Required Textbook:** Introduction to Ore Forming Processes by Robb

**Prerequisites:** No university prerequisites

**Learning Outcomes:** After successfully completing this course, students will: 1) Understand the processes that generate mineral deposits and the factors that make ore deposits economic using an Earth Systems approach; 2) Describe the tectonic settings of ore deposits within the plate tectonic paradigm and key global metallogenic events; 3) Understand how the minerals industry operates, including mining and exploration practices.

**Grading policy:** Final grades will be assigned according to the following schedule. The instructor may also elect to curve the **final** grades in the students' favor.

<u>Grade</u>	<u>Semester average</u>	<u>Grade</u>	<u>Semester average</u>
A	over 93	C	between 73 and 77
A-	between 90 and 93	C-	between 70 and 73
B+	between 87 and 90	D+	between 67 and 70
B	between 83 and 87	D	between 63 and 67
B-	between 80 and 83	D-	between 60 and 63
C+	between 77 and 80	F	less than 60

## Final Grades will be computed as follows:

<b>GEOL 477</b>	Exam 1 (Thursday Feb 21 <sup>st</sup> )	20%
	Exam 2 (Tuesday Mar 26 <sup>th</sup> )	20%
	Exam 3 (Thursday May 2 <sup>nd</sup> )	20%
	Mineral Exploration Presentation	15%
	Mineral Exploration Assignment	25%
		<hr/>
		100%
<b>GEOL 677</b>	Exam 1 (Thursday Feb 21 <sup>st</sup> )	20%
	Exam 2 (Tuesday Mar 26 <sup>th</sup> )	20%
	Exam 3 (Thursday May 2 <sup>nd</sup> )	20%
	Mineral Exploration Presentation	10%
	Mineral Exploration Assignment	20%
	<b>Term project (Graduate students only)</b>	<b>10%</b>
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		100%

Note the different weightings for GEOL477 and GEOL677. This reflects the fact that expectations for Graduate students are higher than for undergraduates. Accordingly, a different grading system is used for GEOL677 relative to the GEOL477 course and an **extra term project** worth 10% of the mark and focused on a given theoretical topic associated with mineralizing systems (e.g. gold complexation in hydrothermal fluids, precipitation mechanisms in differing mineralizing systems) is required for graduate students. Graduate students should choose their own topic in consultation with the faculty member running the course.

The Mineral Exploration Presentation and Assignment consists of a simulated exploration exercise where small groups of students are assigned to evaluate the current thinking on ore deposit genesis for a commodity in which the company is developing a Nevada-wide targeting strategy. Individual groups should select a particular deposit style to focus on and need to provide an overview of the current model(s) for the genesis of that deposit style, and how that relates to Nevada, including areas of known mineralization and areas for future exploration. This will culminate in a **group** presentation and

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the submission of **individual** assignments summarizing these ideas and targets. More details are given in the assignment handout available on Webcampus/Canvas

### **Due dates:**

**Mineral Exploration Presentations:**

**In class, Thursday, Apr 25 and Tuesday Apr 30**

**Mineral Exploration Assignment:**

**Friday May 3<sup>rd</sup>, 5 pm**

**Term Project (Graduate students only)**

**Friday May 3<sup>rd</sup>, 5 pm**

### **Notes on grading:**

1. Required reading means that you are responsible for knowing the assigned material. Your instructor may test you on that material even if it has not been covered in lecture.
2. No extra credit will be given.
3. No make-up exams, make-up quizzes, or make-up exercises will be given except as specified in the University Catalog for religious holidays and university-sponsored extracurricular activities.
4. Assignments that are submitted late without a valid excuse or special consideration will lose 10% of the total mark per 24 hours or part thereof. Work will not be accepted more than seven (7) calendar days late. Deductions apply for weekends as well as weekdays.

### **Notes on Lab sessions:**

Lab sessions will be open access labs for students to work on the Mineral Exploration group assignment; the faculty member running the course will be present in the lab to assist students with their projects and to provide advice. Labs are not held each week of semester; see the schedule in this syllabus for details. Note that attendance at labs is not compulsory. **HOWEVER**, weekly updates from each mineral exploration team are required, and students are advised to use the lab sessions wisely. If labs are poorly attended, then they may be rescheduled or cancelled altogether.

If students cannot attend lab sessions, they should make use of office hours or schedule appointments with the faculty member running the course.

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Week	Dates	Topic	Lecture	Lab Session	
<b>Week 1</b>	Tuesday, Jan 22, 2019	Introduction to ore deposits, deposit classification, mineral economics	Introduction to ore deposits, deposit classification, mineral economics	<b>NO LAB SESSION</b>	
	Thursday, Jan 24, 2019				
<b>Week 2</b>	Tuesday, Jan 29, 2019	Igneous ore-forming processes, genesis of magmatic mineral deposits	Ni-Cu-PGE massive sulfide deposits	<b>LAB, LFG201A, Friday 1<sup>st</sup> February, 11.30am – 2.15 pm</b>	
	Thursday, Jan 31, 2019		PGE-(Cu-Ni) Reef- and contact-type deposits		
<b>Week 3</b>	Tuesday, Feb 5, 2019		Diamond and pegmatite deposits	Ti-V-Fe, and carbonatite deposits	<b>NO LAB SESSION</b>
	Thursday, Feb 7, 2019				
<b>Week 4</b>	Tuesday, Feb 12, 2019	Magmato-hydrothermal ore deposits	Magmato-hydrothermal processes; an overview	<b>LAB, LFG201A, Friday 15<sup>th</sup> February, 11.30am – 2.15 pm</b>	
	Thursday, Feb 14, 2019		Porphyry copper deposits		
<b>Week 5</b>	Tuesday, Feb 19, 2019		<b>EXAM 1</b>	Epithermal and skarn deposits	<b>NO LAB SESSION</b>
	Thursday, Feb 21, 2019				
<b>Week 6</b>	Tuesday, Feb 26, 2019	Magmato-hydrothermal ore deposits	IOCG deposits	<b>NO LAB SESSION</b>	
	Thursday, Feb 28, 2019	<b>NO LECTURE</b>			
<b>Week 7</b>	Tuesday, Mar 5, 2019	Hydrothermal deposits	Introduction to hydrothermal systems	<b>LAB, LFG201A, Friday 8<sup>th</sup> March, 11.30am – 2.15 pm</b>	
	Thursday, Mar 7, 2019		VMS deposits		
<b>Week 8</b>	Tuesday, Mar 12, 2019			Sedex and MVT deposits	<b>NO LAB SESSION</b>
	Thursday, Mar 14, 2019	Sediment-hosted Cu-Co deposits			
<b>SPRING BREAK</b>					
<b>Week 9</b>	Tuesday, Mar 26, 2019	<b>EXAM 2</b>		<b>LAB, LFG201A, Friday 29<sup>th</sup> March, 11.30am – 2.15 pm</b>	
	Thursday, Mar 28, 2019	Sedimentary and residual ore deposits	Introduction to sedimentary ore deposits		
<b>Week 10</b>	Tuesday, Apr 2, 2019		Nevadan metallogeny	BIF, Placer, Laterite and Bauxite deposits	<b>NO LAB SESSION</b>
	Thursday, Apr 4, 2019	Nevadan Metallogeny - Carlin			
<b>Week 11</b>	Tuesday, Apr 9, 2019	Global tectonics and metallogeny	Nevadan Metallogeny – the rest of Nevada	<b>LAB, LFG201A, Friday 12<sup>th</sup> April, 11.30am – 2.15 pm</b>	
	Thursday, Apr 11, 2019		Global tectonics and metallogeny 1		
<b>Week 12</b>	Tuesday, Apr 16, 2019	Exploration Techniques	Global tectonics and metallogeny 2	<b>NO LAB SESSION</b>	
	Thursday, Apr 18, 2019		Exploration techniques 1		
<b>Week 13</b>	Tuesday, Apr 23, 2019	<b>GROUP PRESENTATIONS</b>	Exploration techniques 2	<b>LAB, LFG201A, Friday 26<sup>th</sup> April, 11.30am – 2.15 pm</b>	
	Thursday, Apr 25, 2019				
<b>Week 14</b>	Tuesday, Apr 30, 2019	<b>EXAM 3 (NO FINAL EXAM)</b>		<b>LAB, LFG201A, Friday 3<sup>rd</sup> May, 11.30am – 2.15 pm</b>	
	Thursday, May 2, 2019				

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**Changes to Syllabus:** The above lecture and lab schedule is tentative; adjustments to the schedule of topics and reading assignments may be made in accordance with the rate of progress in the classroom. The instructor also reserves the right to change a lecture topic to reflect world events. Students will be provided with an updated syllabus if significant changes are necessary.

## UNLV Academic Policies

Students taking this course are required to be familiar with the UNLV academic policies at the URL shown below.

Please see the [Student Syllabus Policies Handout](https://www.unlv.edu/sites/default/files/page_files/27/SyllabiContent-MinimumCriteria-2018-2019.pdf) for select, useful information for students. This document can be found at: [https://www.unlv.edu/sites/default/files/page\\_files/27/SyllabiContent-MinimumCriteria-2018-2019.pdf](https://www.unlv.edu/sites/default/files/page_files/27/SyllabiContent-MinimumCriteria-2018-2019.pdf)

## GEOL 477/677 Policies

- 1. Participation** - If you are confused about any of the material presented, please ask questions in class for clarification and further explanation. You will not be alone in your confusion. There are many ways to present this material, and I will attempt to find one that works for you. If you do not feel comfortable asking questions in class, please contact me independently via email or in person.
- 2. Attendance** - It is important that you attend class daily because we cover a lot of material, and I will regularly provide guidance regarding reading assignments and exams. You are responsible for all material covered in lecture no matter what causes your absence. If you miss a lecture, get the notes from a classmate. Topics covered may vary from the schedule somewhat, but the exam dates will remain fixed.
- 3. Missed work** - Exams and assignments missed due to absence will receive a grade of zero or will be subject to the late penalties outlined above unless you provide notification of an exception for a religious holiday or university-sponsored extracurricular activity as specified in the University Catalog. In the case of an excused absence, the nature and format of the make-up exam will be at the instructors' discretion.
- 4. Administrative Drops/Classroom Conduct** - You are required to be familiar with university policies and procedures in the current UNLV Undergraduate Catalog. Importantly, we follow the policies on Administrative Drops/Classroom Conduct as stated in the most recent UNLV Undergraduate Catalog. Any student that does not comply with these requirements, and conducts themselves in a manner that is disruptive and interferes with the right of other students to learn, or of the instructor to teach will be administratively dropped from the course.
- 5. Non-enrolled guests** - Students are not allowed to bring guests, including children, to lectures.
- 6. Academic Misconduct** - This course operates under a "zero tolerance" policy. If any student who commits cheating or plagiarism will receive a grade of F for the class.