

# Syllabus

## Mineralogy GEOL 220-0001

Department of Geoscience

Spring 2022

### Meeting Times and Place

Class period (in person)	Tu Th 8:30AM - 9:45AM	WRI C239
Lab section 1002 (in person)	M 8:30 AM - 11:15 AM	LFG 202
Lab section 1003 (in person)	F 11:30 AM - 02:15 PM	LFG 202

### Instructor and office hours

Instructor:	Dr. Pamela C. Burnley
Office Location:	LFG212
Office Hours:	Monday 3:00 – 4:00 PM
Phone:	702-895-5460
Web Campus:	<a href="https://webcampus.unlv.edu">https://webcampus.unlv.edu</a>
Email:	<a href="mailto:Pamela.Burnley@unlv.edu">Pamela.Burnley@unlv.edu</a>

### Office Hours:

My official office hours are Monday 3:00-4:00 PM in LFG 212. However, due to COVID19, at least for the first portion of the semester, office hours will be held via Webex by appointment at time that is mutually convenient. Please make an appointment to speak with me at least once during the semester to check in, even if you do not have questions or problems. In addition, I am more than happy to discuss the class, geology in general, careers in geology or any other concerns that you may have. If you wish to schedule an appointment, I can be reached by via Canvas or e-mail at [Pamela.Burnley@unlv.edu](mailto:Pamela.Burnley@unlv.edu). You can expect a response from me within 24 hours (except on weekends). If you don't hear from me for some reason, please e-mail me again.

### Teaching Assistant:

Mr. Drew Barkoff; E-mail: [barkoff@unlv.nevada.edu](mailto:barkoff@unlv.nevada.edu)  
Office: TEC 114; Phone: 609-513-8423; Office hours: 4-5PM Mondays or 10-11AM Wednesdays or by appointment.

## Required Texts & Materials:

Introduction to Mineralogy by William D. Nesse (any edition will work); National Audubon Society Field Guide to North American Rocks and Minerals (ISBN: 978-0-394-50269-4); a hand lens, colored pencils and a ruler.

## Web site:

Course materials, lecture recordings, pre-labs, quizzes, homework assignments and links to auxiliary materials will be posted on Canvas. You are responsible for checking the web site regularly for new postings and for downloading or printing your own course materials.

## Course Description

Minerals are the fundamental building blocks of the Earth. A basic understanding of mineral chemistry, mineral occurrence, and mineral identification is a fundamental skill required by all geoscience disciplines. This course focuses on the classification, chemistry, physical properties, and crystallography of minerals forming rocks, ore deposits and soils.

## Course Prerequisite(s):

[CHEM 121A](#) and [CHEM 121L](#) and ( [MATH 127](#) or [MATH 128](#) or higher).

## Learning Outcomes:

After successfully completing this course, students will be capable of:

1. Defining a mineral and discussing the relationships among chemical composition, mineral structure and mineral properties;
2. Describing the symmetry of the six crystal classes and basic crystal forms associated with them;
3. Describing rock forming minerals (include ore minerals) covered in the course in terms of chemistry, mineral structure and physical properties;
4. Identifying a set of major rock and ore forming minerals in hand sample and using the polarizing optical microscope;
5. Describing mineral associations found in igneous, metamorphic and sedimentary rocks;
6. Discussing mineral growth processes in selected geologic settings.

## Course Objective:

The material that you learn in this course, in many ways, will form the foundation for the rest of your education in geoscience. The chemical and physical behavior of rocks is rooted in the physics and chemistry of minerals. We will be learning about how minerals are constructed at the atomic level and how the structure of minerals dictates everything else about them. Since rocks, with only a few exceptions, are constructed of minerals, there is little in geoscience that is not at some level impacted by the study of mineralogy. In addition, we will be mastering the practical

aspects of recognizing minerals in hand sample. Through practice in the laboratory portion of this course, you will learn to identify about 80 common minerals. The knowledge and skills that you take from this course will prepare you for the rest of the courses in the geology major and hopefully reside in your mental "geologist's toolbox" for the duration of your career as a geoscientist.

## **Evaluation Methods:**

Grades will be based on attendance and participation in class, homework, reading and lab assignments, two midterm exams, two lab exams and the final exam. The grades will be weighted as follows:

Quizzes, Homework, Participation	20%
1 <sup>st</sup> lecture exam	15%
2 <sup>nd</sup> lecture exam	15%
Prelabs	3%
Lab assignments	10%
Lab exam	12%
Final Exam	25%

Students must attain an average of 50% on all laboratory work to pass the course. Students must pass the mineralogy basic competency test with a grade of 90% on two occasions at least 3 days apart in order to receive a grade of C or better in the course.

## **Mineralogy Basic Competency Test:**

This is a test that all students must pass twice during the semester with a grade of at least 90% in order to receive a grade of C or better in the course. You will be given a key to the exam early in the semester and may take the exam as many times as you need to in order to meet the requirement. The material on the basic competency test has been developed in consultation with the rest of the faculty in the department and consists of information about minerals that any geologist should know by heart. In order to proceed with the major you must demonstrate that you know and have retained this information. The test will typically be delivered in print but can be given as an oral exam upon request.

## **Attendance Policy:**

Missed class sessions cannot be made up. Missed laboratory periods may be made up but students should not expect individual instruction. Make-up exams and quizzes will be allowed if a student feels unwell, simply notify me as soon as possible. Students missing a class or laboratory assignment because of observance of a religious holiday will have the opportunity to make up missed work. Students must notify me of anticipated absences by the last day of late registration. Students who represent UNLV at any official extracurricular activity shall also have the opportunity to make up assignments, but the student must provide official written notification to me no less than one week prior to the missed class(es). This policy shall not apply in the event that completing the assignment or administering the examination at an alternate time would impose an undue hardship on the instructor or the university that could reasonably have been avoided. There should be good faith effort by both faculty and student to come to a reasonable resolution. When disagreements regarding this policy do arise, they can be appealed to the department chair/unit director, college/school dean, and/or the Faculty Senate Academic Standards Committee. For purposes of definition, extracurricular activities may include, but are not limited to; band, drama, intercollegiate athletics, recruitment, and any other activity sanctioned by a college/school dean, and/or the Executive Vice President and Provost.

## **Time Commitment:**

Daily engagement is very important (see grade policy). In addition to attending class and laboratory, you should expect to spend about 8 hours per week outside of class watching the prerecorded lectures, doing pre-labs, reading and studying for this class. If your time commitment to this class is very different (lots more or lots less) then your study habits may need to be examined.

## **Grading Scale:**

A	95 – 100
A-	90 – 94
B+	87 – 89
B	84 – 86
B-	80 – 83
C+	77 – 79
C	74 – 76
C-	70 – 73
D+	67 – 69
D	64 – 66
D-	60 – 63
F	00 – 59

I reserve the right to assign a higher letter grade in light of the final distribution of point grades.

## **Late Assignments:**

Labs and pre-labs are due at the start of class or lab period on their due date and become "late" as soon as lab begins. Labs may be handwritten but they must be neat and legible. Assignments posted in Canvas will have specified due dates. The value of an assignment drops by 10% once it is late and another 20% for every 7 days that it is late. In general, homework assignments should be printed or typed.

## **Important Dates:**

First day of class	January 18
President's Day recess	February 21
First exam	February 22
Spring Break	March 14 - 18
Second exam	March 31
Last day to drop a class	April 1
Last Day of classes	May 7
Lab Final Exam	During lab period May 2 & 6
Final Exam	Thurs May 12 8 AM - 10 AM (subject to change)

## Course Agenda/Schedule

<b>Date</b>	<b>Lecture/Lab Topic</b>	<b>Assigned chapter in Nesse</b>
1/18	Introduction	1
1/20	Crystallography	2
1/17 & 1/21	No lab	
1/25	Crystallography	
1/27	Crystal Chemistry	3
1/24 & 1/28	Lab 1: Physical Properties: How do we classify minerals?	
2/1	Crystal Structure	4
2/3	Crystal growth and defects	5
1/31 & 2/4	Lab 2: Symmetry, Six Crystal Classes and Miller Indices I	
2/8	Physical properties of minerals	6
2/10	Optical Mineralogy	7
2/7 & 2/11	Lab 3: Symmetry, Six Crystal Classes and Miller Indices II	
2/15	Optical Mineralogy	
2/17	Silicate minerals (overview)	11
2/14 & 2/18	Lab 4: Optical 1 - Microscopy	
2/22	<b>Midterm Exam #1</b>	
2/24	Framework silicates	12
2/21 & 2/25	No lab this week	
3/1	Framework silicates	
3/3	Sheet silicates	13
2/28 & 3/4	Lab 5: Optical 2 - Minerals in thin section	
3/8	Sheet silicates	
3/10	Chain silicates	14
3/7 & 3/11	Lab 6: Framework Silicates	
	Spring Break	
3/22	Chain silicates	
3/24	Disilicates and ring silicates	15
3/21 & 3/25	Lab 7: Sheet Silicates	
3/29	Orthosilicates	16
3/31	<b>Midterm Exam #2</b>	
3/28 & 4/1	Lab 8: Chain Silicates	

4/5	Orthosilicates	
4/7	Carbonates & other -ates	17
4/4 & 4/8	Lab 9: Disilicates, Ring Silicates & Orthosilicates	
4/12	Carbonates & other -ates	
4/14	Oxides, hydroxides & halides	18
4/11 & 4/15	Lab 10: Carbonates, Sulfates and Phosphate	
4/19	Oxides, hydroxides & halides	
4/21	Native Elements	20
4/18 & 4/22	Lab 11: Oxides, Hydroxides, Halides and Borates	
4/26	Sulfides	19
4/28	Nucleation and growth (defects)	5
4/25 & 4/29	Lab 12: Sulfides, Tungstates and Native elements	
5/3	Rocks	11
5/5	Rocks/Review	
5/2 & 5/6	Lab Final	

**Note:** The instructor reserves the right to make changes to syllabus as she deems necessary, to include reading assignments.

## **UNLV Policies**

### **University Policies**

### **Public Health Directives**

Face coverings are currently mandatory for all faculty and students in the classroom. Students must follow all active UNLV public health directives while enrolled in this class. UNLV public health directives are found at [Health Requirements for Returning to Campus](https://www.unlv.edu/coronavirus/health-requirements), <https://www.unlv.edu/coronavirus/health-requirements>. Students who do not comply with these directives may be asked to leave the classroom. Refusal to follow the guidelines may result in further disciplinary action according to the [UNLV Student Conduct Code](https://www.unlv.edu/sites/default/files/page_files/27/StudentConduct-Code.pdf), [https://www.unlv.edu/sites/default/files/page\\_files/27/StudentConduct-Code.pdf](https://www.unlv.edu/sites/default/files/page_files/27/StudentConduct-Code.pdf), including being administratively withdrawn from the course.

### **Academic Misconduct**

Academic integrity is a legitimate concern for every member of the University community. We all share in upholding the fundamental values of honesty, trust, respect, fairness, responsibility, and professionalism. By choosing to join the UNLV community, students accept the expectations of the Student Academic Misconduct Policy, and are encouraged to always take the ethical path whenever faced with choices. Students enrolling at UNLV assume the obligation to conduct themselves in a manner compatible with UNLV's educational mission. An example of academic misconduct is plagiarism. Plagiarism is using the words or ideas of another person, from the Internet or any other source without

proper citation of the source(s). See the [Student Conduct Code](https://www.unlv.edu/studentconduct/student-conduct), <https://www.unlv.edu/studentconduct/student-conduct>.

## **Auditing a Course**

Auditing a course allows a student to continue attending the lectures and/or laboratories and discussion sessions associated with the course, but the student will not earn a grade for any component of the course. Students who audit a course receive the same educational experience as students taking the course for a grade, but will be excused from exams, assessments, and other evaluative measures that serve the primary purpose of assigning a grade.

## **Classroom Conduct**

Students have a responsibility to conduct themselves in class and in the libraries in ways that do not interfere with the rights of other students to learn, or of instructors to teach. Use of devices such as cellular phones and pagers, or other potentially disruptive activities are only permitted with the prior explicit consent of the instructor. Students are specifically prohibited to record classes without instructor authorization, including online/remote classes (either audio only, or video and audio). The instructor may rescind permission at any time during the class. If a student does not comply with established requirements or obstructs the functioning of the class, the instructor may initiate an administrative withdrawal of the student from the course.

Since the COVID-19 pandemic forced some instruction to be delivered remotely starting in Spring 2020, numerous students have asked instructors to record their synchronous classes, so that they can access them at their convenience. Instructors who agree to record their classes (audio only, or video and audio) should inform students in advance. Recorded lectures may not be broadly released to anyone, but made available exclusively to those students enrolled in the class during the particular academic term. Recorded lectures must be stored securely, and are subject to the Nevada System of Higher Education's Records Retention Policy, meaning that the recordings can only be deleted 120 days after the end of class (i.e., after grades are posted). Once this requirement is met, the recordings should be deleted. Class recordings are protected from disclosure, as they are deemed part of an educational record under the Family Educational Rights and Privacy Act (FERPA).

## **Copyright**

The University requires all members of the University Community to familiarize themselves with, and to follow copyright and fair use requirements. You are individually and solely responsible for violations of copyright and fair use laws. The University will neither protect nor defend you, nor assume any responsibility for student or employee violations of fair use laws. Violations of copyright laws could subject you to federal and state civil penalties and criminal liability, as well as disciplinary action under University policies. Additional [copyright policy information](https://www.unlv.edu/provost/copyright) is available at <https://www.unlv.edu/provost/copyright>.

## **Disability Resource Center (DRC)**

The [UNLV Disability Resource Center](https://www.unlv.edu/drc) (Student Services Complex, SSC-A, Room 143, <https://www.unlv.edu/drc>, telephone 702-895-0866) provides resources for students with disabilities. Students who believe that they may need academic accommodations due to a permanent disability, temporary or permanent medical need, or academic support due to pregnancy are encouraged to contact the DRC as early as possible in the academic term. A Disabilities Specialist will discuss what options may be available to you. Students who are already registered with the DRC should request their

accommodations online each semester, and make an appointment to discuss their accommodations with their instructors.

## **Final Examinations**

The University requires that final exams given at the end of a course occur on the date and at the time specified in the Final Exam schedule. The Final Exam schedule is typically available at the start of the semester, and the classroom locations are available approximately one month before the end of the semester. See the [Final Exam Schedule](https://www.unlv.edu/registrar/calendars), <https://www.unlv.edu/registrar/calendars>.

## **Identity Verification in Online Courses**

All UNLV students must use their Campus-issued ACE ID and password to log in to WebCampus-Canvas.

UNLV students enrolled in online or hybrid courses are expected to read and adhere to the [Student Academic Misconduct Policy](https://www.unlv.edu/studentconduct/misconduct/policy), <https://www.unlv.edu/studentconduct/misconduct/policy>, which states that “acting or attempting to act as a substitute for another, or using or attempting to use a substitute, in any academic evaluation or assignment” is a form of academic misconduct. Intentionally sharing ACE login credentials with another person may be considered an attempt to use a substitute, and could result in investigation and sanctions, as outlined in the Student Academic Misconduct Policy.

UNLV students enrolled in online courses are also expected to read and adhere to the [Acceptable Use of Computing and Information Technology Resources Policy](https://www.it.unlv.edu/policies/acceptable-use-computing-and-information-technology-resources-policy), <https://www.it.unlv.edu/policies/acceptable-use-computing-and-information-technology-resources-policy>, which prohibits sharing university accounts with other persons without authorization.

To the greatest extent possible, all graded assignments and assessments in UNLV online courses should be hosted in WebCampus-Canvas or another UNLV-managed platform that requires ACE login credentials for access.

## **Incomplete Grades**

The grade of “I” (Incomplete) may be granted when a student has satisfactorily completed three-fourths of course work for that semester/session, but cannot complete the last part of the course for reason(s) beyond the student’s control and acceptable to the instructor, and the instructor believes that the student can finish the course without repeating it. For undergraduate courses, the incomplete work must be made up before the end of the following regular semester. Graduate students receiving “I” grades in 500-, 600-, or 700-level courses have up to one calendar year to complete the work, at the discretion of the instructor. If course requirements are not completed within the period indicated, a grade of “F” will be recorded, and the student’s GPA will be adjusted accordingly. Students who are fulfilling an Incomplete grade do not register for the course, but make individual arrangements with the instructor who assigned the “I” grade.

## **Library Resources**

Librarians are available to consult with students on research needs, including developing research topics, finding information, and evaluating sources. To make an appointment with a subject expert for this class, please visit the [Libraries’ Research Consultation](https://guides.library.unlv.edu/appointments/librarian) website, <https://guides.library.unlv.edu/appointments/librarian>. You can also [ask the library staff](https://ask.library.unlv.edu/) questions via chat and text message at <https://ask.library.unlv.edu/>.



## Missed Classwork

Any student missing class, quizzes, examinations, or any other class or laboratory work because of observance of religious holidays will be given an opportunity during that semester to make up the missed work. The make-up opportunity will apply to the religious holiday absence only. It is the responsibility of the student to notify the instructor within the first 14 calendar days of the course for Fall and Spring courses (except for modular courses), or within the first 7 calendar days of the course for Summer and modular courses, of their intention to participate in religious holidays which do not fall on state holidays or periods of class recess. For additional information, please visit the Missed Classwork policy, under Registration Policies, on the [Academic Policies](https://catalog.unlv.edu/content.php?catoid=32&navoid=8271&hl=) webpage, <https://catalog.unlv.edu/content.php?catoid=32&navoid=8271&hl=>.

In accordance with the policy approved by the Faculty Senate regarding missed class time and assignments, students who represent UNLV in any official extracurricular activity will also have the opportunity to make up assignments, provided that the student submits official written notification to the instructor no less than one week prior to the missed class(es).

The spirit and intent of the policy for missed classwork is to offer fair and equitable assessment opportunities to all students, including those representing the University in extracurricular activities. Instructors should consider, for example, that in courses which offer a “Drop one” option for the lowest assignment, quiz, or exam, assigning the student a grade of zero for an excused absence for extracurricular activity is both contrary to the intent of the Faculty Senate’s policy, and an infringement on the student’s right to complete all work for the course.

This policy will not apply in the event that completing the assignment or administering the examination at an alternate time would impose an undue hardship on the instructor or the University that could be reasonably avoided. There should be a good faith effort by both the instructor and the student to agree to a reasonable resolution. When disagreements regarding this policy arise, decisions can be appealed to the Department Chair/School Director, College/School Dean, and/or the Faculty Senate Academic Standards Committee.

For purposes of definition, extracurricular activities may include, but are not limited to academic recruitment activities, competitive intercollegiate athletics, fine arts activities, liberal arts competitions, science and engineering competitions, and any other event or activity sanctioned by a College/School Dean, and/or by the Executive Vice President and Provost.

## Rebelmail

Rebelmail is UNLV’s official email system for students and by University policy, instructors and staff should only send emails to students’ Rebelmail accounts. Rebelmail is one of the primary ways in which students receive official University communications, information about deadlines, major Campus events, and announcements. All UNLV students receive a Rebelmail account after they have been admitted to the University. Sending emails within WebCampus-Canvas is also acceptable.

## Tutoring and Coaching

The Academic Success Center (ASC), at the Claude I. Howard Building, provides tutoring, academic success coaching, and other academic assistance for all UNLV undergraduate students. For information regarding tutoring subjects, tutoring times, and other ASC programs and services, please visit the [ASC website](https://www.unlv.edu/asc), <https://www.unlv.edu/asc>, or call 702-895-3177. The ASC is located across from the Student

Services Complex (SSC). Academic success coaching is located on the second floor of SSC A, Room 254. Drop-in tutoring is located on the second floor of the Lied Library, and on the second floor of the College of Engineering building (TBE A 207).

## **UNLV Writing Center**

One-on-one or small group assistance with writing is available free of charge to UNLV students at the [Writing Center](https://writingcenter.unlv.edu/), <https://writingcenter.unlv.edu/>, located in the Central Desert Complex, Building 3, Room 301 (CDC 3–301). Walk-in consultations are sometimes available, but students with appointments receive priority assistance. Students may make appointments in person or by calling the Center, telephone 702-895-3908. Students are requested to bring to their appointments their Rebel ID Card, a copy of the instructions for their assignment, and two copies of any writing they have completed on their assignment.

## **Diversity Statement**

As an institution of higher learning, UNLV represents a rich diversity of human beings among its faculty, staff, and students, and is committed to aspiring to maintain a Campus environment that values that diversity. Accordingly, the University supports understanding and appreciation of all members of its community, regardless of race, sex, age, color, national origin, ethnicity, creed, religion, disability, sexual orientation, gender, gender identity, marital status, pregnancy, genetic information, veteran status, or political affiliation. Please see [University Statements and Compliance](https://www.unlv.edu/about/statements-compliance), <https://www.unlv.edu/about/statements-compliance>.

A successful learning experience requires mutual respect and trust between the students and the instructor. Accordingly, the instructor asks that students be willing to listen to one another's points of view, acknowledging that there may be disagreements, keep discussion and comments on topic, and use first person, positive language when expressing their perspectives.

## **UNLV Land Acknowledgement**

UNLV is situated on the traditional homelands of Indigenous groups, including the Nuwu or Nuwuvi, Southern Paiute People, descendants of the Tudinu, or Desert People. We honor and offer gratitude for those who have stewarded the land; for the land itself; and for the opportunity to cultivate a thriving, diverse, inclusive, and just scholarly community here today that works for a better tomorrow for all.