

Professor: Matthew Lachniet
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Office Hours: T 2:00 – 3:00 pm
Room and Time: TEC 104, T/Th 10:00 – 11:15 am.

Required Textbook: Sharp, Z., 2017. Principles of Stable Isotope Geochemistry, 2nd Edition
 (Free online textbook http://digitalrepository.unm.edu/unm_oer/1/)

Optional recommended textbook: Clark and Fritz, Environmental Isotopes in Hydrogeology.
 Class website: <https://faculty.unlv.edu/lachniet/isotopes.html>

Course Background and Format

GEOL 707 is a 3 credit graduate course in Stable Isotope Geochemistry. The class material will focus on the use of stable isotopic systems as tracers of geological processes on land, ocean, and atmosphere. The course format will be combined lecture/seminar style. Students will each lead a discussion on a particular topic based on readings from the literature. One-page summaries of each paper we read in class are required.

Objectives and Learning Outcomes

The objectives of this class are to familiarize students with current principles and research in isotope geochemistry, and to provide a knowledge base for the student to conduct their own research using stable isotopes. These objectives will be met by a thorough reading of the textbook and selected research articles, as well as completion of assigned problem sets.

At the end of this course, the **Learning Outcomes** for which the student will be responsible will be an ability to

- explain, discuss, and apply the principles of fractionation of stable isotopes
- explain, discuss, and apply the methods, terminology, standards, and practice of mass spectrometry
- attain competency in a survey-level knowledge of the major stable isotopic systems
- attain and in-depth research-level understanding of one or more stable isotopic systems
- competently use Microsoft Excel to solve and graph mathematical problems
- read and understand the published literature on stable isotopic systems
- lead discussions and present material to the class

Student Evaluation and Grading policy

Student evaluation will be based on exams, problem sets, and class participation and involvement as follows:

Assignments/paper summaries	25%
Mid-term Exam (8 th week)	25%
End-semester Research Project (weeks 14/15)	25%
Comprehensive Final exam	25%

Grade ranges (with + and -) will be assigned by percentage as follows: $\geq 90\%$ = A; 80 to 89% = B; 70 to 79% = C; 60 to 69% = D, < 60 = F. Points will be deducted for unexplained absences.

Final Exam time: Monday, December 7, 10:10 am - 12:10 pm, LFG 105.

What do the grades mean?

“A” = exceptional performance and demonstration of expertise

“B” = above average but not exceptional, demonstrating proficiency but not expertise

“C” = average; student has attained basic competency in the course material

“D” = below average

“F” = the student has not demonstrated a basic level of competency in the course material.

To earn an “A” in this class, you should demonstrate exceptional knowledge of the course material. An “A” typically requires that you should: 1) read *all* of the assigned readings, 2) attend class every day and arrive on time, 3) know all of the terminology we discuss in lecture, 4) perform well on exams, and 5) complete all problem sets. Most importantly, students who are naturally curious and ask questions are more likely to perform well.

How much time should you spend studying? A general rule of thumb is 2 to 3 hours of studying for each credit hour you are taking. That means a minimum of 6-9 hours/week to have a shot at getting an "A".

Attendance:

Attendance in lecture is required. More than three unexcused absences will result in you being dropped from the course. It is your responsibility to attend and be on time for lecture.

Topic List: To be modified based on student interest

Background and Theory – More exciting than it sounds

Fractionation – What color M 'n M's do you like?

Tracing the hydrologic cycle – Lao Tzu would be amazed!

Isotope effects – The mountains make weather exciting

Paleothermometry – You mean this rock was baked to a crisp?

Rock-water interaction – A great way to destroy a granite

Carbon Isotopes – Why does eating corn make you feel heavy?

Strontium –What does the building of the Himalaya have to do with human migrations?

Cosmogenic (Beryllium, Aluminum, and Carbon) – Those rocks have a wicked sun-tan!

Cell Phone Policy:

Cell phones have become an integral part of our society, but out of respect for your fellow students and your professor, please turn off all cell phones before entering class. Your peers' time is valuable, and please respect everyone's right to a disruption-free learning experience. It is disrupting to use cell phones – either texting or talking - or leave the room to answer a cell phone call while class is in session, so please practice respect for your fellow students. Leaving class to answer a cell phone call may be counted as an unexcused absence.

Academic Misconduct – Academic integrity is a legitimate concern for every member of the campus community; 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 Academic Misconduct Policy and are encouraged when faced with choices to always take the ethical path. Students enrolling in UNLV assume the obligation to conduct themselves in a manner compatible with UNLV's function as an educational institution. An example of academic misconduct is plagiarism. Plagiarism is using the words or ideas of another, from the Internet or any source, without proper citation of the sources. See the Student Academic Misconduct Policy (approved December 9, 2005) located at: <http://studentconduct.unlv.edu/misconduct/policy.html>. We work on an honors system. If you are aware of cheating, please inform me. It is easy to detect plagiarism of web-based sources, so don't do it. To deter incidents of cheating and/or plagiarism this class employs a "zero tolerance" policy, meaning that if a student commits cheating or plagiarism they receive a grade of F for the class and a notation may be added to your transcript to indicate academic misconduct.

Copyright – The University requires all members of the University Community to familiarize themselves 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 employee or student 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 information can be found at: <http://provost.unlv.edu/copyright/statements.html>.

Disability Resource Center (DRC) – The Disability Resource Center (DRC) determines accommodations that are “reasonable” in promoting the equal access of a student reporting a disability to the general UNLV learning experience. In so doing, the DRC also balances instructor and departmental interests in maintaining curricular standards so as to best achieve a fair evaluation standard amongst students being assisted. In order for the DRC to be effective it must be considered in the dialog between the faculty and the student who is requesting accommodations. For this reason faculty should only provide students course adjustment after having received an “Academic Accommodation Plan.” If faculty members have any questions regarding the DRC, they should call a DRC counselor. UNLV complies with the provisions set forth in Section 504 of the Rehabilitation Act of 1973 and the Americans with Disabilities Act of 1990. The DRC is located in the Student Services Complex (SSC-A), Room 143, phone (702) 895-0866, fax (702) 895-0651. For additional information, please visit: <http://drc.unlv.edu/>.

Religious Holidays Policy – Any student missing class quizzes, examinations, or any other class or lab work because of observance of religious holidays shall be given an opportunity during that semester to make up missed work. The make-up will apply to the religious holiday absence only. It shall be the responsibility of the student to notify the instructor no later than the end of the first two weeks of classes, February 1, 2013, of his or her intention to participate in religious holidays which do not fall on state holidays or periods of class recess. This policy shall not apply in the event that administering the test or examination at an alternate time would impose an undue hardship on the instructor or the university that could not reasonably be avoided. For additional information, please visit: <http://catalog.unlv.edu/content.php?catoid=4&navoid=164>.

Incomplete Grades - The grade of I – Incomplete – can be granted when a student has satisfactorily completed all course work up to the withdrawal date of that semester/session but for reason(s) beyond the student's control, and acceptable to the instructor, cannot complete the last part of the course, and

the instructor believes that the student can finish the course without repeating it. A student who receives an I is responsible for making up whatever work was lacking at the end of the semester. If course requirements are not completed within the time indicated, a grade of F will be recorded and the GPA will be adjusted accordingly. Students who are fulfilling an Incomplete do not register for the course but make individual arrangements with the instructor who assigned the I grade.

Tutoring – The Academic Success Center (ASC) provides tutoring and academic assistance for all UNLV students taking UNLV courses. Students are encouraged to stop by the ASC to learn more about subjects offered, tutoring times and other academic resources. The ASC is located across from the Student Services Complex (SSC). Students may learn more about tutoring services by calling (702) 895-3177 or visiting the tutoring web site at: <http://academicsuccess.unlv.edu/tutoring/>.

UNLV Writing Center – One-on-one or small group assistance with writing is available free of charge to UNLV students at the Writing Center, located in CDC-3-301. Although walk-in consultations are sometimes available, students with appointments will receive priority assistance. Appointments may be made in person or by calling 895-3908. The student's Rebel ID Card, a copy of the assignment (if possible), and two copies of any writing to be reviewed are requested for the consultation. More information can be found at: <http://writingcenter.unlv.edu/>

Rebelmail – By policy, faculty and staff should e-mail students' Rebelmail accounts only. Rebelmail is UNLV's official e-mail system for students. It is one of the primary ways students receive official university communication such as information about deadlines, major campus events, and announcements. All UNLV students receive a Rebelmail account after they have been admitted to the university. Students' e-mail prefixes are listed on class rosters. The suffix is always @unlv.nevada.edu.

Learning Environment

The classroom is intended to be a place of learning, as specified in the UNLV Undergraduate Catalog under Classroom Conduct (p. 63). Any other activities which disrupt the class or interfere with the learning experience of others will not be tolerated. If these guidelines are not followed I may, as outlined in the University Catalog, initiate an administrative drop.