

Medical Geology is the science surrounding the relationships among geological factors and health in humans, animals, and plants. This class focuses on the relationships between geology and human health. Specific topics include: (a) understanding the pathways and exposure (food, water, air), (b) an introduction to the techniques and tools used in medical geology, and (c) specific examples of health effects caused by exposures to Earth materials.

Prereqs: GEOL 220 or GEOL 301; and CHEM 121

Instructor: Dr. Brenda J. Buck,
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Office: 4131 SEB
Class Lecture: M/W 1:00-2:15 pm, TBE-B-176
Office Hours: M/W 2:15-3:15 pm or by appointment (strongly suggested).

Required Text:

Assigned readings, from library or other sources

Other Required Class Items – bring these to class EVERY time:

1. Bluebook – use only ONE, use for the entire semester. Put your name in Large Letters on front.
2. Blue or Black pen
3. Red pen

Learning Outcomes: Upon completion of this course, successful students will be able to demonstrate a comprehensive understanding of several important relationships between our natural environment and human health.

About the Instructor:

I am an elected Fellow in the Geological Society of America and the Soil Science Society of America, and have won the highest award in soil mineralogy/chemistry from the Soil Science Society of America. I have a B.S. degree in Geology from the University of Notre Dame, a M.S. degree in Geology from New Mexico State University, and a Ph.D. in Soils from New Mexico State University. My research specialty is in Medical Geology: Understanding how Earth materials affect human health, I focus on the effects of exposure to mineral dust. I am also an expert in arid soils, and have performed research on topics surrounding paleoclimate, landscape evolution, flood hazards, Earth analogues to Mars, arsenic, asbestos, depleted uranium, and other topics. If you want to learn more:

<http://geoscience.unlv.edu/brendajbuck.htm>

Academic Dishonesty:

ACADEMIC HONESTY, PLAGIARISM AND ETHICS POLICY: It is my belief that academic honesty is the cornerstone of the educational community. There will be severe consequences for academic dishonesty or plagiarism. Please refer to the college catalog: Administrative Policy VIII.E, and <http://studentconduct.unlv.edu/misconduct/policy.html>. As a member of this class each student agrees to the following statements of student behavior:

- **I agree that, unless approved by the instructor, I will not share answers to homework assignments, quizzes, exams, or any other course material with fellow classmates.**
- **I agree that I, and only I, will be the one completing and submitting class materials (homework, quizzes, exams, written projects, etc.) in my name.**

- **I agree that I will not directly copy or plagiarize material from books, publications, the internet, other students' work, or any other source. I am familiar with, and I agree not to violate, copyright laws. If small amounts of material from other sources are used as part of any class assignment, I agree to clearly indicate such and properly cite the source according to APA standards.**
- **I agree that I will not buy papers or course work and submit them as my own.**
- **I acknowledge that failure to comply with any of the above statements may result in failure of an assignment, removal from the course, failure of the course, and discipline action deemed appropriate by the instructor and or policies and procedures set forth by college.**

A student may be dropped from this course for any behavior that is disrupting the learning environment of the other students. Cheating, plagiarism, and other forms of academic dishonesty will not be tolerated. No form of academic dishonesty is acceptable. Academic dishonesty includes any act that violates the academic process of the university.

These acts include (but are not limited to) cheating on an examination, stealing or sharing examination & quiz questions among fellow students, substituting one person for another at an examination, violating the procedures of an examination, falsifying data, destroying or tampering with or stealing a computer program or file, and plagiarizing (using as one's own the ideas or writing of another). Students who cheat will be expelled from the course, receive a grade of "F", and may receive additional disciplinary action as outlined in the University and community college System of Nevada document, Rules and Disciplinary Procedures for Members of the University Community.

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 Student 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>.

Incomplete Grades - The grade of I – Incomplete – can be granted when a student has satisfactorily completed three-fourths of course work for 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. The incomplete work must be made up before the end of the following regular semester for undergraduate courses. 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 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/>.

Classroom Conduct:

We *all* have the right to a comfortable learning and teaching environment. UNLV holds as a fundamental principle that the process of learning is best achieved in a community that recognizes and reflects diversity, and that encourages the open and frank exchange of ideas. All participants in this course, students and instructor alike, are to conduct themselves accordingly, and with respect. Should a situation arise in class which you find uncomfortable, please let me know at your discretion.

Please don't use pagers, cell phones, headsets, or other potentially disruptive devices during either lecture or fieldtrips - they are inevitably disruptive. Turn them OFF. Do not text in this class, or I will ask you to leave. In the rare event of family emergencies that require communications or leaving class mid-lecture **please** just tell me before class - I don't need details, just a polite heads-up. Laptops used for note-taking are permitted so long as they do not distract others around you at all, and only so long as you are not doing anything besides note-taking for this class.

Disability Resource Center (DRC) – The UNLV Disability Resource Center (SSC-A 143, <http://drc.unlv.edu/>, 702-895-0866) provides resources for students with disabilities. If you feel that you have a disability, please make an appointment with a Disabilities Specialist at the DRC to discuss what options may be available to you.

If you are registered with the UNLV Disability Resource Center, bring your Academic Accommodation Plan from the DRC to the instructor during office hours so that you may work together to develop strategies for implementing the accommodations to meet both your needs and the requirements of the course. Any information you provide is private and will be treated as such. To maintain the confidentiality of your request, please do not approach the instructor in front of others to discuss your accommodation needs.

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 702-895 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/>

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 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://www.unlv.edu/provost/copyright>.

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. **Emailing within WebCampus is acceptable.**

Final Examinations – The University requires that final exams given at the end of a course occur at the time and on the day specified in the final exam schedule. See the schedule at: <http://www.unlv.edu/registrar/calendars>.

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, **January 29, 2016**, of his or her intention to participate in religious holidays which do not fall on state holidays or periods of class recess. For additional information, please visit: <http://catalog.unlv.edu/content.php?catoid=6&navoid=531>.

Student Responsibilities: Students are responsible for: text material, participation in class discussions, completion of all projects on schedule and in proper format; attainment of a satisfactory level of achievement for the course.

Makeups & Extra Credit: None allowed without prior authorization.

Assessment: Assessment of these course objectives will be based on exams, quizzes, homework, as described below.

Expectations for Graduate students are higher than for undergraduates. Graduate students are expected to take a leadership role in the class, especially in class discussions. In addition, the quizzes and final exam for graduate students will be graded differently than those for undergraduates.

Participation: In-Class discussion, Assignments	15%
Bluebook Quizzes/Paper Critiques	35%
Research Project/Geosymposium	30%
Mid-term Exam	10%
Final Exam	10%

The Final Exam is comprehensive.

**A = 100-94%; A- = 93-90%; B+ = 89-87%; B= 86-84; B- = 83-80%; C+ = 79-77%;
C = 76-74%; C- = 73-70%; D+ = 69-67%; D = 66-64%; D- = 63-60%; F = 59-0%**

What do the grades mean?

“A” = exceptional performance and demonstration of expertise. Strong evidence of original thinking, ability to analyze and synthesize, superior grasp of subject matter.

“B” = above average but not exceptional, demonstrating proficiency but not expertise. Some evidence of ability to critically analyze, good grasp of subject matter.

“C” = average, just meets expectations; student has attained basic competency in the course material. Understands subject matter.

“D” = does not meet expectations. Some evidence of familiarity with the subject matter and some evidence that critical and analytic skills have been developed.

“F” = the student has not demonstrated a basic level of competency in the course material. Little evidence of even superficial understanding of subject matter, weakness in critical and analytical skills, limited use or ability to use terminology.

To earn an “A” in this class, you should demonstrate *exceptional knowledge* of the course material. An “A” typically requires that you should: (1) Thoroughly read and demonstrate understanding of all of the assigned readings, (2) attend class every day and arrive on time, (3)

know all of the terminology and be able discuss all of the concepts we discuss in lecture, and (4) perform well on exams. Most importantly, students who are naturally curious and ask questions are more likely to perform well. To earn an “A” in this course, graduate students will be expected to demonstrate expertise at and above the level of the textbook, and show a proficient understanding of the selected readings from the primary literature. Undergraduates will be expected to demonstrate proficiency at the level of the textbook and lectures, and a working knowledge of the literature discussed in class.

Daily bluebook quizzes. Each student must have a single bluebook that they will use over the course of the entire semester. Each class day where a reading has been assigned, but before it is discussed in class, the class will start with a quiz over that material. Approximately 5-7 minutes will be allotted at the start of each class period to answer several short written questions. Each student is limited to no more than one of a page in a bluebook *for all of the answers* for a class period unless otherwise stated for specific quizzes. No make-up bluebook quizzes will be allowed, but the 2 lowest grades will be discarded prior to averaging the quizzes at the end of the semester.

Paper Critique Assignments:

Read assigned papers and answer the following questions before class. Bring your written answers to class.

Answering the following questions is a good method to learn how to critically examine the papers and learn from them.

- A. Where did the study take place?
- B. Why was this study conducted? (what hypothesis was tested?)
- C. What exactly was measured? (what methods were used in the analyses?)
Are the methods of data collection sound? Could/did they affect the results?
- D. What were the results of their measurements? (note this question is not asking how they interpreted their data, but just what are the data – summarize the main results)
- E. How did the authors interpret the data?
Do you disagree with any of their interpretations? If so, why?
Are there weaknesses to their interpretations?
Could the results be interpreted differently?
- F. What were the conclusions?
- G. What , if any, assumptions were made? Are they valid? Could/did that effect the conclusions?
- H. What is the significance of the results of this study? Why is it important?

Research Project and Geosymposium Presentation

Choose 1 topic on medical geology receive approval from the instructor for that topic. Written outline of **Topic DUE FEB 17; must include both written outline plus meeting with instructor to discuss your plan.** Project can be accomplished either individually or in groups. Groups require prior approval from instructor and group work requires significantly larger project. Research the topic, identify why it is important to people, determine what the the most up-to-date knowledge is on that subject. Information might include what geologic processes are involved in producing the Earth material that is beneficial or harmful to human health, where this material occurs, what chemistry or mineralogy characteristics are important in its affect on health, what populations are affected, what are the routes of human exposure, what levels are harmful (if applicable), and what scientific tools are utilized in the study of this topic. Prepare a

poster to present at the Geosymposium on this topic. Present your work to the class before Geosymposium in order to gain feedback and suggestions prior to the official presentation at Geosymposium. More information provided in class.

Semester Schedule

Wed Jan 20	Syllabus
Mon Jan 25	Silent Spring video (56 min). Discuss Silent Spring video/HW questions
Wed Jan 27	Bluebook Quiz. Discuss Buck et al, 2016 paper.
Mon Feb 1	No Class – watch Homo Toxicus Film. Begin planning your research project
Wed Feb 3	Discuss Homo Toxicus Film/HW. Discuss Research Topics
Mon Feb 8	Bluebook Quiz. Discuss Plumlee et al. 2006. Paper Critique DUE
Wed Feb 10	Bluebook Quiz. Discuss Morman and Plumlee 2013 or 2014 paper. Paper Critique DUE
Mon Feb 15	No class Presidents Day
Wed Feb 17	Nellis Dunes Research presentation. Research Topics Outline DUE
Mon Feb. 22	Bluebook Quiz. Griffin 2007 Dust/microbes. Paper Critique DUE
Wed Feb 24	Asbestos Film 1
Mon Feb 29	Asbestos Film 2
Wed March 2	Bluebook Quiz. Discuss Harper et al., 2008 Paper Critique DUE
Mon March 7	Bluebook Quiz. Discuss Buck et al., 2013
Wed March 9	Bluebook Quiz. Discuss Metcalf and Buck, 2015
Mon March 14	Bluebook Quiz. Discuss Baumann et al., 2015 & Replies
Wed March 16	Exam
*****March 21 & 23 Spring Break*****	
Mon March 28	Tar Creek Film (54 min). Discussion.
Wed March 30	Bluebook Quiz. Discuss Plumlee et al., 2013. Lead Paper Critique DUE
Mon April 4	Bluebook Quiz. Discuss Centeno et al. 2007 Arsenic
Wed April 6	Bluebook Quiz. Discuss Combs 2005 Nutrition
Mon April 11	Medical geology in the News/Discussion
Wed April 13	In-class Student Research Presentations/discussion
Mon April 18	In-class Student Research Presentations/discussion
Wed April 20	In-class Student Research Presentations/discussion
Mon April 25	In-class Student Research Presentations/discussion
Wed April 27	In-class Student Research Presentations/discussion
*****Friday April 29 Geosymposium Presentations*****	
Mon May 2	No Class.
Wed May 4	Review/Discuss Final exam
May 9 ----- Final Exam ----- May 9, 1:00-3:00 pm	