

Syllabus, GLG362 Geomorphology; Instructor: K. Whipple

1. Course Description

The Earth's near surface environment has been termed the "critical zone" as this is the zone that supports most life and because the Earth's surface is the dynamic interface where much of the geologic record is produced. We now know that we face rapid climate change and the consequences of changes in landuse, water resources, and ecosystems. But how will changes to the environment manifest themselves in the critical zone – in the form and function of the Earth's surface (landforms, water resources, soils, natural hazards, ecosystems) – and how will these changes impact us? Critical to planning a response to, or mitigation of, environmental change is an understanding how the Earth surface works – the interaction of physical, chemical and biotic processes in shaping the surface and determining fluid, solute and sediment fluxes.

This course offers a quantitative introduction to the form and function of the Earth's surface including the essentials of hydrology (runoff, groundwater), rivers, weathering, soil formation, erosion, slope stability, sediment transport, alluvial and coastal landforms, and ice sheet stability. This project-based course includes GIS analysis, interpretation of remotely sensed imagery, and field investigation (2 weekend trips) of geomorphic phenomena. Lessons learned are directly applicable to investigations of other planetary surfaces.

Prerequisites:

GLG 101 or SES 121 with C or better; MAT 266 or 271 with C or better; PHY121/122 or PHY150 with C or better, *or* permission of instructor

2. Learning Outcomes

Learning outcomes include both academic and practical job-skill goals. After taking this course students will be able to:

1. Approach earth science problems systematically through application of the principles of conservation of mass and momentum
2. Understand the fundamentals of surface hydrology and flood generation, including the influence of land use changes
3. Understand fundamental controls on erosion rates and on the pace and pattern of landscape evolution
4. Interpret the past history of climate and tectonic uplift from the record preserved in landforms and sediments
5. Appreciate the mechanisms and sensitivities of earth system response to environmental change (land use change, damming of rivers, climate change)
6. Use Excel and ArcGIS effectively in the analysis of earth science problems
7. Make geologic interpretations of aerial and satellite images

3. Assignments

This is a projects-based course. There are no exams. The course is built around five hands-on projects: (1) Surface Water Hydrology; (2) Cinder Cone Evolution; (3) Verde River Flow Hydraulics; (4) Alluvial Fan Evolution; and (5) Long Term Landscape Evolution. Three projects involve the preparation of technical scientific reports (Surface Water Hydrology, Cinder Cone Evolution, and Alluvial Fan Evolution). Guidelines for best practices in preparation of technical reports are provided. The remaining two projects (Verde River Flow Hydraulics and Long Term Landscape Evolution) involve calculations and data analysis and short-answer paragraph discussions of a set of posed questions. Two projects involve field trips including data collection efforts (Cinder Cone Evolution and Verde River Flow Hydraulics). Participation in both field exercises is strongly recommended, but are not required. All field data collected is shared with all students and the projects and reports are based on analysis of this data. Each project has interim benchmark due dates that are listed in the lab guides and posted on the course website. The interim due dates are imposed to (a) make sure all stay on track, and (b) provide feedback on the underlying analysis before students begin the preparation of their lab project reports.

In this course we will collect data in cooperative groups. Most lecture periods will also involve times when students are asked to discuss lecture topics in small groups and share their ideas with the class. Collaborative work in groups on data analysis is also encouraged as it can enhance the learning experience of all involved. ***However, each student MUST turn in their own final, independent work – reports must be written independently, figures should be finalized independently, and all calculations must be explained independently*** (see statement on Academic Honesty below).

4. Grading Policy and Percentages

Each project is worth 50 points, for a total of 250 points. An additional 5% (12 points) is attributed to participation in class discussions. For projects with written reports, students will be graded both on the accuracy of the data analysis and calculations and on the quality of the written presentation. In depth feedback about report organization, clarity, and writing style will be provided. Grading of written reports follows this template (50 point total):

Presentation (15)

- Clear statement of objectives, motivation and hypothesis(es) (5)
- Clarity (writing, illustrations, integration of text and figures) (10)

Analysis (25)

- Data / interpretations clearly separated (10)
 - unit definitions / criteria
 - relative age criteria
- Internal consistency of interpretation (15)
 - cogent synthesis of data
 - pro and con evidence presented
 - appropriate mapping considering focus of report

- alternate models recognized and considered

Further Work (10)

- Define problem areas (specific) and alternate hypotheses (5)
- Suggest future work and solutions (specific / feasible) (5)

Important: I will grade based on internal consistency, logic, clarity of writing and figures. I will not grade based on whether you have come up with the “right” answer. There is in fact no known “right” or complete answer to some of the problems you will tackle in this class.

LATE ASSIGNMENTS

Requests for modifications in assignment due dates must be made in writing and an approved by the instructor in advance of the due date of the assignment.

5. Required Readings

Textbook: Geomorphology: The Mechanics and Chemistry of Landscapes, Anderson and Anderson. Cambridge Univ. Press, 2010.

Weekly reading assignments from the text are detailed in the course schedule (in bold), typically one chapter per week.

Additional reading assignments of journal articles are associated with 3 of the 5 class projects. These are noted in the course schedule and will be posted to the course website.

6. Course Schedule – see separate document.

GRADE APPEALS

The College of Liberal Arts and Sciences has formal and informal channels to appeal a grade. If you wish to appeal any grading decision, please see: <http://clas.asu.edu/advising-and-academic-services/academic-grade-grievance>.

INCOMPLETES

A mark of “I” (incomplete) is given by the instructor when you have completed most of the course and are otherwise doing acceptable work but are unable to complete the course because of illness or other conditions beyond your control. Students who are granted a grade of “I” are required to arrange with the instructor for the completion of the course requirements and are recorded using the following form: <http://students.asu.edu/forms/incomplete-grade-request>.

STUDENT STANDARDS

Students are required to act in accordance with university and Arizona Board of Regents policies as outlined in the ABOR Code of Conduct: Arizona Board of Regents Policies 5-301 through 5-308: <https://students.asu.edu/srr>.

ACADEMIC INTEGRITY

Academic honesty is expected of all students in all examinations, papers, laboratory work, academic transactions and records. The possible sanctions include, but are not limited to, appropriate grade penalties, course failure (indicated on the transcript as a grade of E), course failure due to academic dishonesty (indicated on the transcript as a grade of XE), loss of registration privileges, disqualification and dismissal. For more information, see <http://provost.asu.edu/academicintegrity>.

If you fail to meet the standards of academic integrity in any of the criteria listed on the university policy website, sanctions will be imposed by the instructor, school, or dean. Academic dishonesty includes borrowing ideas without proper citation, copying others' work (including information posted on the internet), and failing to turn in your own work for group projects. Please be aware that if you follow an argument closely, even if it is not directly quoted, you must provide a citation to the publication, including the author, date, and page number. If you directly quote a source, you must use quotation marks and provide the same sort of citation for each quoted sentence or phrase.

You may work with other students on assignments, however, all writing that you turn in must be done independently (unless otherwise noted). If you have any doubt about whether the form of cooperation you contemplate is acceptable, ask the instructor in advance of turning in an assignment. Please be aware that the work of all students submitted electronically can be scanned using *SafeAssignment*, which compares them against everything posted on the internet, online article/paper databases, newspapers and magazines, and papers submitted by other students (including yourself if you have submitted work for a previous class).

Note: Turning in an assignment (all or in part) that you completed for a previous class is considered self-plagiarism and falls under these guidelines. Any infractions of self-plagiarism are subject to the same penalties as copying someone else's work without proper citations.

STUDENT SUPPORT AND DISABILITY ACCOMMODATIONS

In compliance with the Rehabilitation Act of 1973, Section 504, and the Americans with Disabilities Act of 1990, professional disability specialists and support staff at the Disability Resource Center (DRC) facilitate a comprehensive range of academic support services and accommodations for qualified students with disabilities.

Qualified students with disabilities may be eligible to receive academic support services and accommodations. Eligibility is based on qualifying disability documentation and assessment of individual need. Students who believe they have a current and essential need for disability accommodations are responsible for requesting accommodations and providing qualifying documentation to the DRC. Every effort is made to provide reasonable accommodations for qualified students with disabilities.

Qualified students who wish to request an accommodation for a disability should contact their campus DRC at: <http://www.asu.edu/studentaffairs/ed/drc/>.

If you are a student in need of special arrangements, we will do all we can to help, based on the recommendations of these services. For the sake of equity for all students, we cannot make any accommodations without formal guidance from these services. Typically, once a student discloses the need for an accommodation the faculty member, the student, and DRC will develop a plan on how to best accommodate the student within the parameters available within the course.

DROP AND ADD DATES/WITHDRAWALS

Please refer to the [academic calendar](#) on the deadlines to drop/withdraw from this course. Consult with your advisor and notify your instructor if you are going to drop/withdraw this course. If you are considering a withdrawal, review the following ASU policies: [Withdrawal from Classes](#) and [Medical/Compassionate Withdrawal](#).

EMAIL COMMUNICATIONS

All email communication for this class will be done through your ASU email account. You should be in the habit of checking your ASU email regularly as you will not only receive important information about your classes, but other important university updates and information. You are solely responsible for reading and responding if necessary to any information communicated via email.

CAMPUS RESOURCES

As an ASU student, you have access to many resources on campus. This includes tutoring, academic success coaching, counseling services, financial aid, disability resources, career and internship help, and many opportunities to get involved in student clubs and organizations.

- Tutoring: <http://studentsuccess.asu.edu/frontpage>.
- Counseling Services: <http://students.asu.edu/counseling>.
- Financial Aid: <http://students.asu.edu/financialaid>.
- Disability Resource Center: <http://www.asu.edu/studentaffairs/ed/drc/>.
- Major/Career Exploration: <http://uc.asu.edu/majorexploration/assessment>.
- Career Services: <http://students.asu.edu/career>.
- Student Organizations: <http://www.asu.edu/studentaffairs/mu/clubs/>.

HARASSMENT PROHIBITIONS

ASU policy prohibits harassment on the basis of race, sex, gender identity, age, religion, national origin, disability, sexual orientation, Vietnam era veteran status, and other protected veteran status. Violations of this policy may result in disciplinary action, including termination of employees or expulsion of students. Contact Student Life (UCB 221) if you feel another student is harassing you based on any of the factors above; contact EO/AA (480-965-5057) if you feel an ASU employee is harassing you based on any of the factors above.

ESTABLISHING A SAFE LEARNING ENVIRONMENT

Learning takes place best when a safe environment is established in the classroom. Students enrolled in this course have a responsibility to support an environment that nurtures individual and group differences and encourages engaged, honest discussions. The success of the course rests on your ability to create a safe environment where everyone feels comfortable to share and explore ideas. We must also be willing to take risks and ask critical questions. Doing so will effectively contribute to our own and others intellectual and personal growth and development. We welcome disagreements in the spirit of critical academic exchange, but please remember to be respectful of others' view points, whether you agree with them or not.

SYLLABUS DISCLAIMER

The course syllabus is an educational contract between the instructor and students. Every effort will be made to avoid changing the course schedule but the possibility exists that unforeseen events will make syllabus changes necessary. The instructor reserves the right to make changes to the syllabus as deemed necessary. You will be notified in a timely manner of any syllabus changes via email or through Blackboard.

STUDENT CONDUCT STATEMENT

Students will be required to adhere to the behavior standards listed below:

- Arizona Board of Regents Policy Manual Chapter V – Campus and Student Affairs: Code of Conduct <http://www.azregents.edu/policymanual/default.aspx>.
- ACD 125: Computer, Internet, and Electronic Communications <http://www.asu.edu/aad/manuals/acd/acd125.htm>.
- ASU's Student Academic Integrity Policy <http://www.asu.edu/studentaffairs/studentlife/srr/index.htm>.

Students are entitled to receive instruction free from interference by other members of the class. If a student is disruptive, an instructor may ask the student to stop the disruptive behavior and warn the student that such disruptive behavior can result in withdrawal from the course. An instructor may withdraw a student from a course when the student's behavior disrupts the educational process under USI 201-10 (<http://www.asu.edu/aad/manuals/usi/usi201-10.html>).

Course discussion messages should remain focused on the assigned discussion topics. Students must maintain a cordial atmosphere and use tact in expressing differences of opinion.

Inappropriate discussion board messages may be deleted if an instructor feels it is necessary. Students will be notified privately that their posting was inappropriate. Student access to the course Send Email feature may be limited or removed if an instructor feels that particular students is sending inappropriate electronic messages to other students in the course.

RELIGIOUS ACCOMMODATIONS

Students who need to be absent from class due to the observance of a religious holiday or participate in required religious functions must notify the faculty member in writing as far in advance of the holiday or obligation as possible. Students will need to identify the specific holiday or obligatory function to the faculty member. Students will not be penalized for missing class due to religious obligations or holiday observance and are responsible for contacting the instructor to make arrangements for making up tests/assignments within a reasonable time.