Environmental Geology (ENV 301)

Professor: Rhawn Denniston Office: 202 Norton Phone: x4306 E-mail: RDenniston Office Hrs: 8:45-9:15; 11:15-11:30; 3:00-3:30

Text and Readings and Materials There is no textbook for this course. You will read *The Control of Nature* by John McPhee, sections of *Cadillac Desert* by Mark Reisner, as well as assorted articles. You should bring a calculator to each class.

Course Meeting Times 9:15 – 11:15 am and 1:15 – 3:00 pm Monday - Friday (except as scheduled below)

Grading Scheme 10% Fieldtrip Reports; 10% McPhee Paper; 10% Reisner Paper; 15% Homeworks; 25% Final Exam; 25% Field Project (write-up/talk); 5% Attendance/Participation

Policy on Late Work Homework assignments, papers, and exams are to be completed within the scheduled time frame. You will be penalized 25% for every day that the assignment is late. If you have a college-sanctioned excuse for missing class or an assignment deadline, notify me immediately.

Course Description and Goals This course will investigate the ways in which geology and society interact. To that end, we will discuss the movement of groundwater and surface water, the formation of soils, the composition of the atmosphere, and how each of these impacts on common features such as wells, wastewater treatment plants, and landfills.

Reading and Writing In addition to a field project and time in lecture, you will do a GREAT DEAL of reading in this class. You are expected to read everything I assign, and to do so carefully and on time. As for your paper, I expect you to write well, and I am happy to help you refine your writing and editing skills. As I will expand on later, a grade of "C" will be assigned to a paper with some misspellings, awkwardly worded sentences, mediocre structuring, poor word choices, an abundance of passive verbs, etc. In order to achieve grades above "C", you must have a minimum of grammatical/spelling errors, write cleanly and clearly, and articulate your thoughts well. The grade of "A" is reserved for exceptionally well-constructed papers without spelling or grammatical errors, and solid, well-backed arguments.

Exam Information covered in reading assignments, fieldtrips, videos, problem sets, and in lecture is fair game for the test.

Academic Honesty Cornell College expects all members of the Cornell community to act with academic integrity. An important aspect of academic integrity is respecting the work of others. A student is expected to explicitly acknowledge ideas, claims, observations, or data of others, unless generally known. When a piece of work is submitted for credit, a student is asserting that the submission is her or his work unless there is a citation of a specific source. If there is no appropriate acknowledgment of sources, whether intended or not, this may constitute a violation of the College's requirement for honesty in academic work and may be treated as a case of academic dishonesty. The procedures regarding how the College deals with cases of academic dishonesty appear in *The Compass*, our student handbook, under the heading "Academic Policies – Honesty in Academic Work."

Students with Disabilities Students who need accommodations for learning disabilities must provide documentation from a professional qualified to diagnose learning disabilities. For more information see cornellcollege.edu/disabilities/documentation/index.shtml. At the beginning of each course, the student must notify the instructor within the first three days of the term of any accommodations needed for the duration of the course.

Cell Phones and Laptops – I have a zero tolerance for texting or talking on cell phones during class. Cell phones should be turned off during class periods. Texting on, talking into, or in any other way interacting with a cell phone during class hours will result in your immediate expulsion from the course and a grade of F. You may turn them on before class, at break, and after class. Similarly, if you have a legitimate need to take notes on your laptop, you should present your rationale to me. However, if you use your laptop during class hours for anything other than course-related work, you will be (1) excused from the class for the rest of the day, and (2) not allowed to use your laptop again in class.

Monday	Tuesday	Wednesday	Thursday	Friday
9:00 – Introductory Geology 1:15 – Rocks & Minerals; Topo Maps; Intro to Excel HW- Intro Geo & Excel questions Read- McPhee	9:15 – **Intro geo/Excel questions due**; Topographic maps, contouring exercise, watershed boundaries 1:15 – dendritic drainage, random walk ex, incision vs aggradation, impacts of dams, Manning equ, Reynolds numbers, river systems, flood control; rating curve HW- Manning, topo problems Read- McPhee	9:15 – **Manning, topo questions due**; basin characteristics, recurrence intervals, infiltration 1:15 – infiltration exercises, groundwater to river (decay equation) HW- groundwater flow probs Read: McPhee	9:15 – **gw flow probs due**; aquifers; porosity; K; Darcy's Law; fracture flow; equivalent K; hydraulic head 1:15 – Leaky Aquitard exer HW- well problems Read- McPhee	9:15 – **well probs due**; confined and unconfined aquifers; total stress, effective stress, and fluid pressure; compression and subsidence 1:15 – Blow out exercise HW- groundwater problems Read- McPhee; Subsidence
8:30 – **groundwater probs due**; Fielldtrip- Dows Preserve 1:15 – measuring K at different scales (permeameter; slug test; pumping tests) HW- K problems Read- Water Quality: The Issues; Miss Basin N; McPhee	9:15 – **K probs due**; Discuss Readings; Groundwater Chemistry; Waste and Drinking Water Treatment Plant Designs 1:15 – Dows Project Time HW- none Read- Orange River; Ag Pump Ar; 1872 Law; McPhee	9:15 – Groundwater Chemistry (cont'd) 1:15 – Landfill design; soil and water remediation; **McPhee summary paper due; discuss McPhee** HW- groundwater chemistry probs Read- Reisner	9:15 – **gw chem probs due**; Guest Lecture: David Osterberg (Fracking sands in NE Iowa) 1:15 – Dows Project Time HW- none Read- Reisner; Big Spring Fieldtrip Guide	8:30 – 12:30 Fieldtrip to Landfill 1:15 – no class HW: landfill fieldtrip report Read- Reisner
9:15 – **landfill fieldtrip report due**; Pleistocene Climate Cycles 1:15 – Holocene Climate Variability HW- Climate problems Read- Reisner	9:15 – **Climate problems due;** ENSO; Modern and Future Climate 12:30- Fieldtrip Mt. Vernon Wastewater & Water Treat Plants HW- Climate problems; diagram of water and waster water plants Read –Reisner; Long-Term Data Show Lingering Effects Acid Rain	8:00 – 6:00 **Climate problems due; Water treatment plants fieldtrip report due;** Big Spring Fieldtrip HW- Big Spring Fieldtrip Report Read- Reisner	9:15 – no class; recover from fieldtrip 1:15 – **Big Spring fieldtrip report due**; Atmos: Ozone; Acid Rain HW- Acid rain and stratospheric ozone questns Read- Reisner	9:15 – Discuss Readings; Radiation in the Environment 1:15 – Dows Preserve Project HW- Radiation problems Read- In Search of Water; Facing up Nuke Waste; Reisner
9:15 – **Radiation probs**; **Dows Preserve Project Report and Presentations -** *attendance is mandatory* 1:15 – **Presentation cont'd** HW & Read- none	8:30 - 12:00 **– Reisner paper due**; Cadillac Desert Videos- *attendance is mandatory* 1:15 – *Dam Nation (attendance is mandatory)* HW& Read- none	8:30 - **Final Exam**		