A Syllabus of
Engineering and Environmental Geology

Spring Semester, 2018 (Jan. 16- Apr. 26, 2018)

Course number: GSCI3710/CE3530/ENVE3530
Instructor: Prof. Lanbo Liu (email: Lanbo.Liu@UConn.edu)
Department: Civil and Environmental Engineering, U-3037
Lecture: Tuesday & Thursday, 9:30-10:45 am
HuskyCT: http://lms.uconn.edu/webct
TA: Rishav Aryal (email: rishav.aryal@uconn.edu)
TA Office Hours: Monday/Friday 2:30-4:30 PM, Castleman 123
Textbook: Geology Applied to Engineering, by Terry R. West, Waveland Press
Room: Castleman 201 (CAST 201)
Credit: 3 units
Homework: due in 1 week from the date of assignment
Grading: Homework: 40%; Midterm: 30%; Final: 30%

Week 01:
Tue. Introduction: the role of geology in civil and environmental engineering.
Thu. Reviews of fundamental math, Physics, units, and some useful constants.
Reading: Chapter 1, 20.

Week 02:
Tue. Rocks and tectonic cycle; Rock types, Mineralogy, Petrology.
Thu. Engineering properties of rocks.
Reading: Chapter 2, 3, 4, 5.

Week 03:
Tue. Engineering classification; Rock strength
Thu. Rocks as engineering materials.
Reading: Chapter 6

Week 04:
Tue. Combination of Mohr circle and Coulomb criterion. Rock mechanics summary;
Thu. Weathering: Mechanical and Chemical weathering, soil profiles
Reading: Chapter 6

Week 05:
Tue. Physical and chemical properties of soils; Soil profiles; agricultural soil maps.
Thu. Surface water, Groundwater hydrogeology: water table, hydraulic head, Darcy’s law, Groundwater distribution
Reading: Chapter 15
Week 06:
Tue.  Permeability, pumping test.
Thu. (2/22)  Visit Connecticut Advanced Pavement Lab (CAPLab);
Reading:  Chapter 15

Week 07:
Thu.  Physiographic Provinces and Engineering Consideration
Reading:  Chapters 12, 13

Week 08:
Tue.  Review of contents before break.
Thu. (3/8)  Midterm examination.
Reading:  Chapters 11, 15

Week 09: Spring Break Mar. 12 - 16, 2018 no class.

Week 10:
Tue.  Coastal problems, Coastal erosion and Coastline protection; Coast hazards: tsunami, salt water intrusion
Thu.  Stress, deformation, pore pressure, joints, effective stress, and faults
Reading:  Chapter 16

Week 11:
Tue. (3/27)  Groundwater Field trip
Thu.  Engineering Geophysics: seismic refraction
Reading:  Chapter 18

Week 12:
Tue.  Engineering Geophysics: electric resistivity tomography (ERT)
Thu.  Engineering Geophysics: frequency domain and time domain electromagnetics
Reading:  Chapter 18

Week 13:
Tue.  Engineering Geophysics: ground penetrating radar (GPR)
Thu.  Geohazard: Earthquakes Strong ground motion
Reading:  Chapter 10

Week 14:
Tue.  Geohazards: Mass movement and landslides
Thu.  Retaining structure failure: Slope stability and Subsidence
Reading:  Chapter 14

Week 15:
Tue.  Course summary
Thu.  Final exam