

Note: For all co-listed 400-500-level courses, the text used below (“Shares lecture with EARTH 4XX, but is graded separately”) will be changed to be in accord with a future planned Grad Council decision to standardize this language, with a more explicit indication that more work and/or better performance will be expected of grad students.

New course to be offered by Peter Mozley. Has been run as EARTH 489 in past.

ERTH 4XX (461?), Reservoir and Caprock Analysis, 3 cr, 3 cl hrs

Prerequisites: EARTH 202 and 203 or consent of instructor

Offered on demand

The class focuses on the role of sedimentary and structural heterogeneities in controlling porosity, permeability, and fluid flow in the subsurface. Topics include controls on conventional and unconventional reservoir quality and performance, evaluating caprock integrity, and the influence of faults and fracture networks on fluid flow. Applications to petroleum geology, petroleum engineering, carbon sequestration, and hydrology. There is a mandatory field trip associated with the class, which involves camping and moderately strenuous hiking on uneven ground. Shares lecture with EARTH 5XX, but is graded separately.

GEOL 5XX (561?), Reservoir and Caprock Analysis, 3 cr, 3 cl hrs

Prerequisites: Graduate standing or consent of instructor

Offered on demand

The class focuses on the role of sedimentary and structural heterogeneities in controlling porosity, permeability, and fluid flow in the subsurface. Topics include controls on conventional and unconventional reservoir quality and performance, evaluating caprock integrity, and the influence of faults and fracture networks on fluid flow. Applications to petroleum geology, petroleum engineering, carbon sequestration, and hydrology. There is a mandatory field trip associated with the class, which involves camping and moderately strenuous hiking on uneven ground. Shares lecture with EARTH 4XX, but is graded separately.

Courses to be offered by new Assistant Professor Kierran Maher

ERTH 3XX (360?), Earth Resources and Environmental Issues, 2 cr, 2cl hrs, 3 lab hrs

Prerequisite: any 200-level EARTH class with associated lab

Offered fall semester, on demand

Overview of the economics, geologic occurrence and extraction of earth resources. Coverage includes metallic, non-metallic, and energy resources, soils and groundwater, and the environmental impacts related to their use and extraction. Field trip.

ERTH 431, Exploration Geochemistry, 3 cr, 2cl hrs, 3 lab hrs

Prerequisite: EARTH 380; EARTH 462 recommended

Pre- or Corequisite: EARTH 412 or equivalent

Offered spring semester, on demand

An introduction to the generation, evaluation, and interpretation of geochemical datasets used in mineral exploration. Overview of trace element behavior in geologic environments. Sampling methodology and media, analytical techniques, data quality evaluation, and report writing. Field trip. Shares lectures with EARTH 531 but graded separately.

GEOC 531 Exploration Geochemistry, 3 cr, 2cl hrs, 3 lab hrs

Pre- or Corequisite: EARTH 412 or equivalent

Offered spring semester, on demand

An introduction to the generation, evaluation, and interpretation of geochemical datasets used in mineral exploration. Overview of trace element behavior in geologic environments. Sampling methodology and media, analytical techniques, data quality evaluation, and report writing. Field trip. Shares lectures with EARTH 431 but graded separately.

Notes:

ERTH360 as shown is offered fall semester. My expectation is to offer it every year, unless enrollment drops, in which case "on demand" allows for its less frequent offering.

My expectation is to offer EARTH 431/GEOC 531 in spring semesters in years alternating with the offering of EARTH 462. However, doing this means that the first offering will be in 2016. I might decide to offer it next spring (2015) for students who may be graduating in the next year and a half instead of waiting two years, hence "on demand".

Courses to be offered by Assistant Professor of Geophysics Jolante van Wijk

To REPLACE GEOP 525 Tectonophysics (remove GEOP 525 from catalog):

GEOP 5XX (559?), Geodynamics, 3 cr, 2 cl hrs, 3 lab hrs

Prerequisites: Graduate standing or consent of instructor

Offered Spring semester, even-numbered years

How does the Earth deform? Theory of mantle convection, rheology of the mantle and lithosphere, lithosphere deformation, heat transport in the Earth, and melting. Emphasis is on current controversies in geodynamics, and the formulation of mathematical models that explain the physical observations. Same as GEOL 5XX. Shares lecture with EARTH 4XX, but is graded separately.

GEOL 5XX (559?), Geodynamics, 3 cr, 2 cl hrs, 3 lab hrs

Prerequisites: Graduate standing or consent of instructor

Offered Spring semester, even-numbered years

How does the Earth deform? Theory of mantle convection, rheology of the mantle and lithosphere, lithosphere deformation, heat transport in the Earth, and melting. Emphasis is on current controversies in geodynamics, and the formulation of mathematical models that explain the physical observations. Same as GEOP 5XX. Shares lecture with EARTH 4XX, but is graded separately.

ERTH 4XX (459?), Geodynamics, 3 cr, 2 cl hrs, 3 lab hrs

Prerequisites: EARTH203 or 204

Offered Spring semester, even-numbered years

How does the Earth deform? Theory of mantle convection, rheology of the mantle and lithosphere, lithosphere deformation, heat transport in the Earth, and melting. Emphasis is on current controversies in geodynamics, and the formulation of mathematical models that explain the physical observations. Shares lecture with GEOP/GEOL 5XX, but is graded separately.

New description for EARTH 460 to reflect updated content:

ERTH 460, Petroleum and subsurface geology, 3 cr, 2 cl hrs, 3 lab hrs

Prerequisites: EARTH 203

Offered Spring semester

Principles of subsurface geology, geophysics, and basin analysis applied to petroleum systems. Topics include: composition, movement, and entrapment of petroleum; subsurface fluid pressure regimes (hydrostatic and dynamic); thermal evolution of sedimentary basins and petroleum source rock analysis; geodynamics of sedimentary basins; borehole and surface geophysics; facies and reservoir analysis; analysis of fluid and rock properties. Laboratory work includes measurements of porosity and permeability, structure contouring, pore pressure analysis of evolving sedimentary basins, bore hole correlation using geophysical well logs, reservoir volumetric calculations, construction of geologic cross sections; well hydraulics, and petroleum system modeling.

Changes to the Geochemistry catalog entries

1. Add:

GEOC 507, Hydrogeochemistry, 3 cr, 3 cl hrs

Prerequisite: CHEM 122

Pre- or Corequisite: EARTH 440

Offered fall semesters

The thermodynamics and aqueous chemistry of natural waters, with emphasis on groundwater.

Chemical equilibrium concepts, surface chemistry, redox reactions, and biochemistry. The interaction of water with the atmosphere and geologic materials. Basic concepts applied to problems of groundwater quality evolution, water use, and groundwater contamination.

Shares lecture with EARTH 407 but is graded separately (Same as CHEM 531, HYD 507)

2. Also need to **change entries for HYD 507 and CHEM 531 to add “Same as GEOC 507” inside parentheses where “Same as CHEM 531” or “Same as HYD 507” already exists.**

3.

GEOC 546, Contaminant Hydrology, 3 cr, 3 cl hrs

Prerequisites: EARTH 440; HYD 507

Pre- or Corequisite: HYD 508

Offered alternate fall semesters

The physics, chemistry, and biology of inorganic, organic, and microbial contaminants in groundwater and surface water systems. Mechanisms by which contaminants are introduced. Transport and transformations of contaminants in surface waters, the vadose zone, and the saturated zones. Movement, capillary trapping, and solubility of relatively immiscible organic liquids. Contaminant isolation and remediation techniques. **(Same as HYD 546)**

4. Also need to **change HYD 546 entry to add at end: (Same as GEOC 546)**

continued next page

Changes to GEOC MS Degree requirements (change is highlighted and underlined):

5.

GEOC 507 should be added to the GEOC MS requirements, and will count toward the “12 credit hours in geochemistry” that are already required:

Master of Science in Geochemistry

The Master of Science degree in Geochemistry may be earned either with thesis or without thesis in accordance with the general requirements of the Graduate Program.

The master’s candidate must demonstrate competence in chemistry, geology, mathematics, and physics comparable to the requirements for the Bachelor of Science degree in either chemistry, one of the engineering sciences, or one of the geological sciences. A program of study for the master’s degree must be approved by the student’s advisory committee and must satisfy the general requirements for the degree, including GEOC 590 (at least three credit hours) or GEOC 591 (at least six credit hours). Students must complete two credit hours of GEOC 592, at least four credit hours of GEOC 593 (unless the degree is completed in a shorter time), 12 credit hours in geochemistry, (which can also include EARTH 390 Principles of Geochemistry)) and six credit hours in upper- division or graduate chemistry courses. As part of the degree requirements, students must have completed CHEM 331; **GEOC 507**, GEOC 544, EARTH 200 (mineralogy); or their equivalents.