

transport, and selected numerical solution techniques. Applications to water resource, environmental, and geological problems.

Credit Hours: 3

Prerequisites: GEOL 4100 or equivalent

GEOL 7150: Structural Geology

(cross-leveled with GEOL 4150) The mechanical behavior of earth materials. Analysis of the geometry and mechanics of faults, fractures, and folds. Laboratory includes problems on stresses and strains associated with deformation, geometric analysis of deformation structures, and interpretation of geologic maps.

Credit Hours: 4

Prerequisites: instructor's consent and GEOL 1100 or GEOL 2130 or GEOL 1200 and MATH 1140 or MATH 1160 or MATH 1500

GEOL 7180: Solar System Science

(same as PHYSCS 7180 and ASTRON 7180). Investigates physical states, interior structures and comparative geology of solar systems bodies: planets, moons, asteroids, comets, sun. Solar system formation and evolution.

Credit Hours: 3

Prerequisites: MATH 1700 and PHYSCS 1220 or PHYSCS 2760 or instructor's consent

GEOL 7200: Economic Geology with Laboratory

Geochemistry of ore deposits. Introduction to types of mineral deposits, genesis of ore, and current areas of research. Laboratory emphasizes hand-specimen and polished-section studies of a wide variety of ore deposit types.

Credit Hours: 4

Prerequisites: GEOL 4900

GEOL 7300: Introduction to Low-Temperature Geochemistry

Introduction to the chemical alteration of rock-forming minerals in weathering environments and to factors controlling the chemical composition of subsurface water.

Credit Hours: 3

Prerequisites: GEOL 3300 or instructor's consent

GEOL 7318: Environmental Soil Chemistry

(same as SOIL 7318 and ENV_SC 7318; cross-leveled with GEOL 4318, SOIL 4318, ENV_SC 4318). Study of chemical constituents and processes occurring in soils. Topics include soil minerals, and weathering processes organic matter, solution chemistry, oxidation-reduction reactions and adsorption processes.

Credit Hours: 3

Prerequisites: SOIL 2100 or GEOL 2400, CHEM 1320 and CHEM 1330 or instructor's consent

GEOL 7350: Taphonomy

(cross-leveled with GEOL 4350). The purposes of this course are to 1) analyze patterns in the history of life and 2) to recognize the biased processes that led to its preservation. We will accomplish these goals by examining two disparate fossil preservation pathways: 1) Konservat lagerstätten: fossil deposits that are notorious for the exceptional and

rare preservation of soft tissues and 2) Konzentrat lagerstätten: fossil deposits that are exceptional for the enormous amount of fossilized skeletal material they contain. Through careful examination of both the rare and hyper-abundant we can address the fundamental question of paleobiology: how literally can the fossil record be read as the history of life? Graded on A-F basis only.

Credit Hours: 3

GEOL 7370: Conservation Paleobiology

(cross-leveled with GEOL 4370). Humans are having an undeniable influence on Earth systems, including the biosphere. Climate change, habitat destruction, over-hunting/harvesting, pollution, and invasive species are among the primary stressors of modern biodiversity. How have ecosystems responded to such stressors in the past? How do we determine what a "pristine" ecosystem looks like when planning ecosystem restoration? Paleontologists are uniquely equipped to address these questions using the fossil record. In this course we will review the important questions in this emerging discipline, learn about the tools used to address these questions, and learn from case studies involving invertebrate, vertebrate, and plant fossils from a variety of environments.

Credit Hours: 3

GEOL 7500: Organic Geochemistry

(cross-leveled with GEOL 4500). Topics include chemistry of petroleum-forming reactions and their kinetic parameters; use of organic-chemical criteria in source-rock evaluation; carbon isotope fractionation in organic precursors of biological molecules; early history of earth's atmosphere.

Credit Hours: 3

Prerequisites: instructor's consent

GEOL 7650: Plate Tectonics

(cross-leveled with GEOL 4650). Formation, evolution, and structure of the earth. Rules, causes, and implications of plate tectonics with emphasis on present-day features.

Credit Hours: 3

Prerequisites: GEOL 3250, GEOL 3650 or instructor's consent

GEOL 7680: Neotectonics and Earthquake Geology

(cross-leveled with GEOL 4680). Introduction to techniques and concepts of active crustal deformation from the geological and geodetic perspectives. Topics include tectonic geomorphology, paleoseismology, Quaternary dating, tectonic geodesy, numerical models of faults, and earthquake hazard assessment.

Credit Hours: 3

Prerequisites: GEOL 4150 or GEOL 4650

GEOL 7700: Theoretical Geochemistry

Introduction to theoretical concepts in low and high temperature geochemistry. Topics include thermodynamics of fluids, gases and solids in geological materials, phase diagrams, equilibrium constants, electrolyte theory, oxidation-reduction reactions.

Credit Hours: 3

Prerequisites: GEOL 3250, CHEM 1330 and MATH 1700
