

Master Course Syllabus
Department of Chemistry and Geosciences

Structural Geology (GEOL 3123)

Catalog Description: **Structural Geology. (2-3)** A study of the forces and processes resulting in the deformation of and structural features of units in the earth's crust. Lab work includes solution of problems by descriptive geometry, geologic and topographic maps and cross-sections. Lab fee \$10.

Prerequisites: GEOL 1054; GEOL 1064; MATH 1093 or approval of department head.

Expanded Course Description: This is an upper-level course that is required for multiple support areas in the Geoscience program. It is intended for students majoring or minoring in Geoscience. The course is a detailed study of stress and strain in the earth, and the relationship of these stresses and strains to faults, folds, and plate tectonics. The course has a heavy emphasis on field and lab work. Topics covered include: physical properties of the earth; force, stress, and strain; brittle and ductile deformation of rocks; primary and non-tectonic structures; the role of pore fluid pressure and confining pressure in rock behavior; joints and veins; faults and faulting; folds and folding; salt structures; extensional, compressional, and strike-slip regimes; whole earth structure; plate tectonics; geologic map construction and interpretation; cross-section construction; anatomy and use of the Brunton compass; balancing of cross-sections; and stereographic projection.

Intended Knowledge, Skill, and Value Outcomes: Students who successfully complete this course will be able to: identify geologic structures in the field and on geologic maps; infer tectonic setting from resident geologic structures; name, sketch, and describe geologic structures found in association with specific tectonic settings; construct balanced cross-sections from geologic maps; determine true dips from apparent dips and/or sparse well data; analyze stress data to anticipate rock behavior; use a Brunton compass; and understand the importance of structural geology in the location of natural resources.

Course Requirements: The course grade is determined by a combination of the following elements, subject to the instructor's discretion: non-comprehensive lecture exams, a comprehensive final exam, a term paper, oral presentations; quizzes; and the laboratory grade (consisting, subject to the instructor's discretion, of weekly laboratory exercises, field trips, and laboratory exams).

Department Head Signature/Date:

Signature

Date