

**131. Mechanics of Materials (3)**

Prerequisite: Engr 30. Application of principles of mechanics to find stresses and deformations in machine and structural members.

**131L. Mechanics of Materials Laboratory (1) (Former Engr 132)**

Prerequisite: Engr 32; 131 (or concurrently). Application of the principles and methods of testing to verify theory and determine limitations of principles of mechanics of materials. (3 lab hours)

**133. Steel and Timber Structures (3)**

Prerequisite: Engr 135. Steel and timber members for buildings and bridges designed for dead, live, impact, wind, and seismic forces; light gage and plastic steel design. (2 lecture, 3 lab hours)

**134. Reinforced Concrete (3)**

Prerequisite: Engr 135. Design and investigation of concrete structures by elastic and ultimate design procedures; prestressed concrete. (2 lecture, 3 lab hours)

**135. Theory of Structures (3)**

Prerequisite: Engr 131. Trusses and frames analyzed by algebraic and graphic procedures; influence lines and Cooper diagrams; rigid frames analyzed by slope deflection and moment distribution.

**136. Physical Metallurgy (2)**

Prerequisite: Engr 131L. Physical properties of metals as manufactured and affected by heat-treatment and forming processes; correlation of properties with microstructure. (1 lecture, 3 lab hours)

**137. Soil Mechanics (3)**

Prerequisite: Engr 131L. Physical and mechanical properties of soil as an engineering material; theoretical studies in permeability, compressibility and compression and stress-deformation and strength characteristics. (2 lecture, 3 lab hours; field trips)

**138. Highway Engineering (2)**

Prerequisite: Engr 2; 137 (or concurrently). Feasibility and economic considerations in location, design, construction, and maintenance of streets and highways.

**139. Advanced Mechanics of Materials (3)**

Prerequisite: Engr 70, 131; Math 81. Advanced topics in mechanics of materials.

**141. Irrigation Engineering (2)**

Prerequisite: Engr 131, 164. Flow of water in canals, design of canals and canal systems, measurements of water, surveys for irrigation systems. (1 lecture, 3 lab hours; field trips)

**142. Water Supply and Sanitation (2)**

Prerequisite: Engr 164. Water treatment plants, distribution systems, waste collection systems and disposal facilities; storm drainage systems. (2 lecture; field trips)

**143. Concrete Laboratory (1)**

Prerequisite: Engr 131L; 134 (or concurrently). Proportioning of concrete mixes; admixtures; test for entrained air; slump test; compressive and flexural strength tests; reinforced concrete. (3 lab hours; field trip)

**144. Foundation Design (3)**

Prerequisite: Engr 137, 134 (or concurrently). Theory and design of footings, piles, retaining walls, and other structures combining the use of soil mechanics and structural analysis.