

Courses**ENGINEERING**

Note: Associated lecture and laboratory courses must be taken concurrently except for Engr 140, 140L; 160, 160L; 161, 161L; and 163, 163L.

1. Plane Surveying: Elementary (2)

Prerequisite: Math B, C, one year of mechanical drawing, or permission of instructor. Familiarization with surveying instruments; calculations and map drawing.

1L. Plane Surveying: Elementary Laboratory (1)

Field practice in measurement of distances and in use of the level and transit for practical problems. (3 lab hours; field trips)

2. Plane Surveying: Advanced (2)

Prerequisite: Engr 1, 1L. Theory and computation covering topographic surveying, land surveying, mine surveying, engineering astronomy, subtense bar.

2L. Plane Surveying: Advanced Laboratory (1)

Field practice in land surveying, triangulation, astronomy; transit and plane table mapping. (3 lab hours; field trips)

11. Manufacturing Processes (2)

General purpose and production machine tools, metal cutting and welding, hot and cold forming, grinding, gages, jigs, fixtures, tooling.

11L. Manufacturing Processes Laboratory (1)

Operation of machine tools, welding equipment, hot and cold forming equipment, casting equipment; practice in the use of gages, jigs, and fixtures. (3 lab hours; field trips)

25. Engineering Graphics (5)

For students who have not had one year of high school mechanical drawing, or who fail the mechanical drawing proficiency test. Not open to students with credit in Engr 26. Prerequisite: plane geometry, trigonometry, Math 3 (or concurrently). Elementary mechanical drawing and lettering; use of instruments; geometric constructions; balance of course content same as Engr 26. (3 4-hour lecture-labs)

26. Engineering Graphics (4)

May be taken for reduced units by students with credit in part of this work; not open to students with credit in Engr 25 or equivalent. Prerequisite: plane geometry, trigonometry, Math 3 (or concurrently); one year high school mechanical drawing and satisfactory score on mechanical drawing proficiency test. Principles of descriptive geometry and application to three-dimensional problems in engineering; pictorials, dimensioning, working drawings; graphical mathematics—functional scales, empirical equations, elementary concurrency and alignment charts, nomograms. (3 3-hours lecture-labs)

30. Analytical Mechanics: Statics (3)

Prerequisite: Physics 4A; Math 6 (or concurrently). Statics, analysis of force systems, equilibrium problems, friction, graphic and algebraic methods of problem solution, centroids and moments of inertia.

32. Materials of Engineering Construction (2)

Prerequisite or concurrently: Engr 30. Properties of engineering materials; basic structure of materials, mechanical properties, and control of properties during production and fabrication.