

Statics for Mechanical Engineering

1. **Course number and name:** 020STMNI4 Statics for Mechanical Engineering
2. **Credits and contact hours:** 2 ECTS credits, 1x1:15 contact hours
3. **Name(s) of instructor(s) or course coordinator(s):** Nada Ghorra.
4. **Instructional materials:** PowerPoint slides; course handouts.

5. Specific course information

a. Catalog description:

Statics is an introduction to learning and applying the principles required to solve engineering problems. Concepts will be applied in this course from previous courses taken in basic math and physics. The course addresses the modeling and analysis of static equilibrium problems with an emphasis on real world engineering applications and problem solving. The purpose of this course is to study methods for quantifying the forces between bodies and defining their equilibrium. Forces are responsible for maintaining balance and causing motion of bodies, or changes in their shape. Motion and changes in shape are critical to the functionality of objects and structure. Statics is an essential prerequisite for many branches of engineering, such as civil engineering and mechanical engineering, which address the various consequences of forces.

b. Prerequisites: 020MC1NI1 Mechanics 1

c. Required/Selected Elective/Open Elective: Required

6. Educational objectives for the course

a. Specific outcomes of instruction:

- Quantify the forces between bodies.
- Identify external Couples
- Define the static equivalent force and moments of a system of external forces
- Classify the different types of structures.
- Identify internal forces of the structure elements
- Realize the equilibrium of several bodies
- Study of trusses and identify internal forces in bars

b. PI addressed by the course:

PI	1.2	1.3
Covered	x	x
Assessed	x	x

7. Brief list of topics to be covered

- Definitions and identifications of forces and moment due to a force about a point, and moment due to a couple (1 lecture)
- Static equivalence and summation of several forces and external couple (1 lecture)
- Analyze of general equilibrium for bodies in two (2D) and three (3D) dimensions loaded with simple concentrated forces, couples and distributed loads (2 lectures)
- Introduction to internal forces, study of axial load (2 lectures)
- Study of equilibrium, classification of structures, and introduction to different types of supports (2 lectures)
- Equilibrium of bodies with engineering connections, (1 lecture)
- Study of equilibrium, classification of structures, and introduction to different types of supports (2 lectures)
- Study of trusses and identification of internal forces in each bar (3 lectures)