

Mechanics (D)

Calendar: 1st day semester

Contact Hours: TP 45,0 h; OT 7,5 h

Scientific Area: Mechanics and structures

Intended learning outcomes (knowledge, skills and competences to be developed by the students):

It is intended that after the attendance of this course unit, students are able to: (i) solve problems involving the equilibrium of particles and rigid bodies, with and without friction; (ii) obtain mass centre position and the moment of inertia; (iii) solve problems to obtain internal forces in linear elements of structures.

Syllabus:

1. Statics of the particles in a plane and in space.
2. Equilibrium rigid bodies in a plane and in space.
3. Distributed forces: Centroid, static moments and moments of inertia.
4. Analysis of structures: trusses, simple structures, machines
5. Dry friction. Square screw thread, axis, discs.

Evidence of the syllabus coherence with the curricular unit's intended learning outcomes:

With the syllabus taught at the chapters 1 and 2 the students acquire the ability to solve problems involving the equilibrium of particles and rigid bodies without friction.

With the syllabus taught at the chapter 3 the students acquire the ability to obtain the mass centre position and the moment of inertia. With the syllabus taught in chapter 4, students acquire the ability to solve problems for linear internal forces in elements of structures.

With the syllabus taught at the chapter 5 the students acquire the ability to solve problems involving the concept of friction.

References:

Ferreira, P. S. – Mecânica. Estática. Escola Superior de Tecnologia do Barreiro, 2008.

Ferreira, P. S. – Mecânica. Atrito. Escola Superior de Tecnologia do Barreiro, 2008.

Ferreira, P. S. – Mecânica. Geometria de massas. Escola Superior de Tecnologia do Barreiro, 2008.

Neves, R. D. – Mecânica. Exercícios resolvidos. Escola Superior de Tecnologia do Barreiro, 2009.

Beer, F. P.; Johnston, E. R.; Eisenberg, E. R. – Mecânica Vectorial Para Engenheiros. Estática.

McGraw-Hill de Portugal, Nona edição, 2012