

Strength of Materials II

Introducing

Description

Beam theory:

- Transition from the real system to the beam type model: average line and geometric properties of sections, connections, loading, linear elastic material;
- Static reminders – Balance – Linking actions – Isostaticity and hyperstaticity;
- Internal forces: normal force, bending, shear force, torsion;
- Stress/strain/displacement fields and potential energy of elastic deformation associated with the different internal forces;
- Methods for solving hyperstatic structures (by application of the superposition principle and Castigliano's theorem).

Objectives

The student will be able to assess:

The mechanical behavior of isostatic and hyperstatic “beam” type structures under static loading:

- Model a “beam” type structure (geometric characteristics, support and loading),
- Calculate the support actions and internal forces,
- Calculate the stress, deformation and displacement fields associated with each type of internal force,
- Calculate the potential energy of elastic deformation,
- Apply resolution methods for hyperstatic structure of degree 1.

Necessary prerequisites

Mechanics
Materials science
Mathematical tools

Évaluation

L'évaluation des acquis d'apprentissage est réalisée en continu tout le long du semestre. En fonction des enseignements, elle peut prendre différentes formes : examen écrit, oral, compte-rendu, rapport écrit, évaluation par les pairs...

Practical info

Location(s)

 Toulouse