



STRUCTURAL MECHANICS

Enrollment year	2017/2018
Academic year	2018/2019
Regulations	DM270
Academic discipline	ICAR/08 (CONSTRUCTION SCIENCE)
Department	DEPARTMENT OF CIVIL ENGINEERING AND ARCHITECTURE
Course	CIVIL AND ENVIRONMENTAL ENGINEERING
Curriculum	PERCORSO COMUNE
Year of study	2°
Period	1st semester (01/10/2018 - 18/01/2019)
ECTS	6
Lesson hours	50 lesson hours
Language	
Activity type	WRITTEN AND ORAL TEST
Teacher	MORGANTI SIMONE - 5 ECTS SCALET GIULIA - 1 ECTS
Prerequisites	The course requires the knowledge of the topics of Analisi Matematica A (Calculus A), Fisica Matematica (Rational Mechanics) and Geometria and Algebra (Linear Algebra). Moreover, basic notions from the course of Fondamenti di Informatica (Basics of Informatics) are useful.
Learning outcomes	The goal of this module of the course of Mechanics of Solids and Structures is to provide the students with the basic and general ideas to tackle complex structural systems. The two fundamental steps are a first phase of construction of the system model (with a particular focus on beam models) and a second more practical phase aiming at the determination of the static equilibrium, as well as of the stress and strain state.
Course contents	1. Rigid body systems Introduction, definitions and static equilibrium equations. Constraints.

	<p>Kinematic analysis. Static analysis. Geometric and static determination. Static indetermination and mechanisms. Analytical and graphical solution methods. Computation of reaction forces. Modeling of complex structural systems and their reduction to simple statically determined schemes.</p> <p>2. Stress state analysis Truss systems. Beams. Generalized stress diagrams for beams and frames.</p> <p>3. Statically indeterminate systems Bernoulli-Euler deformable beams. Methods for the determination of the stress and deformation states. Continuous beams. Use of Mohr's analogy for the deformation and reaction force determination.</p> <p>4. Multiply statically indeterminate systems Displacement approach. Matrix form of the problem.</p> <p>5. Potential further topics Timoshenko deformable beams.</p>
Teaching methods	<p>Lectures (hours/year in lecture theatre): 90 Practical class (hours/year in lecture theatre): 0 Practicals / Workshops (hours/year in lecture theatre): 0</p>
Reccomended or required readings	Lecture notes.
Assessment methods	Written examination: theoretical questions and exercises
Further information	Written examination: theoretical questions and exercises
Sustainable development goals - Agenda 2030	\$lbl legenda sviluppo sostenibile