

Academic year 2025/2026

Courses offered by the programme

Mathématiques appliquées (MA)

Semester(s) :

Curricula are organized in groups of courses (Unités d'Enseignement (UE)), consisting of several courses (Éléments Constitutifs (EC)). An EC is a teaching module including lectures (cours magistraux (CM)), tutorials (travaux dirigés (TD)), laboratory work (travaux pratiques (TP)), projects (PR), conferences (CONF), personal work (TA) and possibly other pedagogical activities (DIV). Some internships (stages (ST)) are compulsory

Commonly used abbreviations

CM : Lectures

TD : Tutorials

TP : Laboratory Work

CONF : Conferences

TA : Personal Work

PR : Project

ST : Internship

DIV : Miscellaneous

Resistance of Materials	GMA06-RDM
Number of hours : 56.00 h	3.00 ECTS credit
CM : 22.00 h, TD : 22.00 h, TP : 12.00 h	
Reference Teacher(s) : RAGNEAU Eric	

Objectives :

This module is a more pragmatic extension of the "Continuum Mechanics" module of semester 5, including simplification of the classic Beam Theory and experimental basics in Resistance of Materials leading to familiarisation with the basic tools necessary in Mechanics for the calculation and design of parts.

Content :

Theory of Elasticity as applied to beams in 3D (Reminder). Beam Theory (fundamental hypothesis). Strain and deformation due to normal stress and bending moments (pure flexion, simple flexion, composed flexion, deviated flexion, etc). Strain and deformation due to the cutting stress (full cross-section, slim cross-section: shearing flux, torsion centre, etc). General theorems for the calculation of displacement and rotation of mean-plane beams (application of the Energy Theorems seen in Continuum Mechanics, NAVIER-BRESSE's equation). General methods to solve hyperstatic beam systems. Isostatic straight beams. Hyperstatic straight beams with one span.

Bibliography :

M. KERGUIGNAS, G. CAIGNAERT : Résistance des Matériaux. DUNOD (1997).
M. ALBIGES : Résistance des Matériaux Appliquée. DUNOD.
J. COURBON : Résistance des Matériaux. DUNOD (1971).

Requirements :

General Mechanics and Continuum Mechanics

Organisation :

Evaluation :

Three-hour written examination.
Mark for practical work in the laboratory

Target :