ENGINEERING FOR SAFETY OF CRITICAL INDUSTRIAL AND CIVIL

(Lecce - Università degli Studi)

Teaching STRUCTURAL MODELLING FOR SAFETY ENGINEERING

GenCod A008900

Owner professor ROSSANA DIMITRI

Teaching in italian STRUCTURAL MODELLING FOR SAFETY ENGINEERING

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SSD code ICAR/08

Reference course ENGINEERING FOR SAFETY OF CRITICAL INDUSTRIAL AND

Course type Laurea Magistrale

Credits 6.0

Teaching hours Front activity hours: 54.0

For enrolled in 2025/2026

Taught in 2025/2026

Course year 1

Language ENGLISH

Curriculum INDUSTRIAL AND CIVIL INFRASTRUCTURES

Location Lecce

Semester Second Semester

Exam type Oral

Assessment Final grade

Course timetable https://easyroom.unisalento.it/Orario

BRIEF COURSE DESCRIPTION	The course presents the main approaches for modeling the material and structural behavior under the effects of different loading conditions, focusing on the crack propagation in elastic media and structures, ductile-brittle fracture transition phenomena, thermo-elastic/plastics models, damage under increased temperatures, elasto-plastic and stability behavior of different structural members under a static and dynamic loading.
REQUIREMENTS	Structural mechanics.
COURSE AIMS	At the end of the course, the students will have a solid knowledge of the structural modeling strategies and FEM-based computational tools allowing a robust safety analysis of resilient structures and infrastructrues, for different geometries, boundary conditions, loading conditions, and material properties.
TEACHING METHODOLOGY	Frontal lessons and exercises.
ASSESSMENT TYPE	Oral exam

FULL SYLLABUS

- Plates and shells
- Finite element method
- Dynamics of discrete and continuous systems
- Buckling instability in slender, thin, and shallow structures
- Long-span structures: dynamcis and buckling
- High-rise structures: statics and dynamics
- Theory of plasticity
- Plane stress/strain conditions
- Mechanics of fracture

REFERENCE TEXT BOOKS

Alberto Carpinteri - Advanced Structural Mechanics, CRC Press, Taylor & Francis Group