AEROSPACE ENGINEERING (LM52)

(Brindisi - Università degli Studi)

Teaching MATHEMATICAL AND NUMERICAL METHODS IN AEROSPACE ENGINEERING, WITH

GenCod A003291
Owner professor Raffaele VITOLO

Teaching in italian MATHEMATICAL AND NUMERICAL METHODS IN AEROSPACE ENGINEERING, WITH

Teaching MATHEMATICAL AND NUMERICAL METHODS IN AEROSPACE

SSD code MAT/07

Reference course AEROSPACE ENGINEERING

Course type Laurea Magistrale

Credits 6.0

Teaching hours Front activity hours: 54.0

For enrolled in 2022/2023

Taught in 2022/2023

Course year 1

Language ENGLISH

Curriculum CURRICULUM AEROSPACE DESIGN

Location Brindisi

Semester First Semester

Exam type Oral

Assessment Final grade

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

BRIEF COURSE DESCRIPTION	Algorithms and methods of approximate solution of algebraic and differential equations, with computer experiments.
REQUIREMENTS	Calculus of functions of one or more real variables; linear algebra.
COURSE AIMS	The Students will reach the following objectives: ▪ Knowledge and understanding: partial differential equations and their origin as mathematical models for physics and engineering. ▪ Ability to apply knowledge and understanding: computational abilities for differential equations. The techniques will be tought during the lectures. ▪ Autonomy: all concepts will be based on computations that the Students can repeat or expand in an autonomous way, and can be used in a variety of situations. ▪ Communicating abilities: the course does not involve comminicative abilities in a significant way. ▪ Learning abiliites: the Students will learn that complex mathematical problems can be solved with computer.
TEACHING METHODOLOGY	Lectures and computer experiments.
ASSESSMENT TYPE	Oral exam on the course program (as exposed during the lectures) and proof of knowledge of the Matlab language.

FULL SYLLABUS	Matrix computations Principles of numerical mathematics Direct methods for the solution of linear systems Iterative methods for the solution of linear systems Iterative methods for eigenvalues and eigenvectors Solution of non-linear algebraic equations Polynomial interpolation of functions and data Numerical integration Orthogonal polynomials and Fourier transform Numerical solution of ODEs Introduction to PDEs for Engineers Finite difference methods and finite element methods for PDEs.
REFERENCE TEXT BOOKS	Quarteroni, Sacco, Saleri: Numerical Mathematics, 2nd ed., Springer 2006.