

# AEROSPACE ENGINEERING (LM52)

(Brindisi - Università degli Studi)

## Insegnamento AEROSPACE STRUCTURES AND CERTIFICATION (MOD.1) C.I.

GenCod A006605

Docente titolare Saverio LAZZARO

**Insegnamento** AEROSPACE STRUCTURES AND CERTIFICATION

**Insegnamento in inglese** AEROSPACE STRUCTURES AND CERTIFICATION

**Settore disciplinare** ING-IND/04

**Corso di studi di riferimento** AEROSPACE ENGINEERING

**Tipo corso di studi** Laurea Magistrale

**Crediti** 6.0

**Ripartizione oraria** Ore Attività frontale: 54.0

**Per immatricolati nel** 2023/2024

**Erogato nel** 2023/2024

**Anno di corso** 1

**Lingua**

**Percorso** CURRICULUM AEROSPACE SYSTEMS

**Sede** Brindisi

**Periodo**

**Tipo esame** Orale

**Valutazione**

**Orario dell'insegnamento**

<https://easyroom.unisalento.it/Orario>

### BREVE DESCRIZIONE DEL CORSO

The course introduces to the finite elements method: basic structural schemes are developed and solved using commercial F.E.A. software. Certification issues are analysed in the second part. The course is completed by an experience in Laboratory where a static test is designed, carried out and analysed.

### PREREQUISITI

Knowledge of calculus, basic concepts of continuum mechanics, solid mechanics.

### OBIETTIVI FORMATIVI

Capability of developing a finite element model for aerospace structural applications  
Capability of aerospace structures' engineering analysis and numerical results interpretation  
Capability of debugging numerical models  
Knowledge of the certification process in the aeronautical field  
Knowledge of how a structural certification test is carried out

### METODI DIDATTICI

Frontal lectures  
Assignments  
Laboratory

### MODALITA' D'ESAME

Development of a FE model in classroom  
Discussion of the certification issues

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## PROGRAMMA ESTESO

Introduction to the finite elements method. The Galerkin method for the discretization of structures. Resolution of a truss loaded with concentrated loads. The commercial software used for the Finite Elements models development. Simple elements. Masses. Bars. Beams. Panels. Solid models. Materials. Simple structural schemes. The loads. The boundary conditions. The different structural analyses. Linear static analysis. Normal modes analysis. Transient analysis. Buckling analysis. The interpretation of the results. The visualization of the results. Integration of CAD/CAE. Certification specifications in the aeronautical field. CS 23, CS 25, CS VLA, CS VLR. The certification documentation. Certification tests. The flutter certification. A full development of a structural component: from the requirements to the design and calculation; the manufacturing and test with the final interpretation of the numerical and experimental results.

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## TESTI DI RIFERIMENTO

Handouts prepared by the teacher; engineering books proposed by the teacher (es: NIU, ROARK)