

# AEROSPACE ENGINEERING (LM52)

(Brindisi - Università degli Studi)

## Insegnamento AERODYNAMICS (MOD.1) C.I.

GenCod A005137

Docente titolare Francesco DE VITA

**Insegnamento** AERODYNAMICS (MOD.1) C.I.

**Insegnamento in inglese** AERODYNAMICS (MOD.1) C.I.

**Settore disciplinare** ING-IND/06

**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** 2021/2022

**Erogato nel** 2021/2022

**Anno di corso** 1

**Lingua**

**Percorso** Percorso comune

**Sede** Brindisi

**Periodo** Secondo Semestre

**Tipo esame** Orale

**Valutazione**

**Orario dell'insegnamento**

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

### BREVE DESCRIZIONE DEL CORSO

*The course provides the fundamentals for the study of gas dynamics and aerodynamics. Starting from the formulation of the fundamental equations of gas dynamics in vector notation, the one-dimensional and quasi-one-dimensional gas dynamics is studied, analyzing the isentropic conditions and the normal shocks, in order to characterize the flow through nozzles. Two-dimensional supersonic flows are then studied taking into account oblique shocks and Prandtl-Meyer expansion waves and finally the flow past airfoils. After recalling the concepts of classical aerodynamics, the approximate solution to several important aerodynamic problems is addressed employing the potential flow assumption. Finally, the study of finite wing theory is carried out.*

### PREREQUISITI

*Basic knowledge of Calculus (derivatives and integrals), Applied Thermodynamics and Fluid Dynamics*

### OBIETTIVI FORMATIVI

*At the end of the course the student must:*

- Know the fundamental equations of gas dynamics in vector notation and their simplification in the simplified case of: one-dimensional flow; quasi-one-dimensional flow; multi-dimensional irrotational flow;
- Know how to characterize and calculate the properties of the flow through a normal shock, an oblique shock, an expansion wave
- Know how to evaluate the force coefficients in the case of airfoils in a supersonic flow
- Know the fundamental aspects of the flow past an airfoil and past a finite wing, along with the evaluation of the force coefficients.

### METODI DIDATTICI

*Lectures supported by the use of a computer and a projector*

### MODALITA' D'ESAME

*Oral test.*

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TESTI DI RIFERIMENTO

*John D. Anderson Jr., "Modern compressible flow: With historical perspective", Mc-Graw-Hill, Int. Ed. 1990.*

*John D. Anderson Jr., "Fundamental of Aerodynamics", Mc-Graw-Hill, 6th Ed. 2016.*