

AEROSPACE ENGINEERING (LM52)

(Brindisi - Università degli Studi)

Insegnamento SPACE PROPULSION MOD. 2

GenCod A003310

Insegnamento SPACE PROPULSION
MOD. 2

Insegnamento in inglese SPACE
PROPULSION MOD. 2

Settore disciplinare ING-IND/07

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 2018/2019

Erogato nel 2018/2019

Anno di corso 1

Lingua INGLESE

Percorso PERCORSO COMUNE

Docente Maria Grazia DE GIORGI

Sede Brindisi

Periodo Primo Semestre

Tipo esame Orale

Valutazione

Orario dell'insegnamento

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

BREVE DESCRIZIONE DEL CORSO

This course presents aerospace propulsive devices with particular focus on rocket engine

PREREQUISITI

-Fluid dynamic and fluid machinery

OBIETTIVI FORMATIVI

1 Gain knowledge of different types of aero-engines (turbojets, turbofans, ramjets) and to understand the aerodynamic and thermodynamic characteristics of major rocket components.
2 Develop the knowledge and skills to analytically and numerically solve problems related to aerospace propulsion systems.
3 Develop skills in working independently.
4 Develop skills in critical evaluation of scientific literature.

METODI DIDATTICI

Theory and practical activities

MODALITA' D'ESAME

The final exam consist of two part:
1)Written and oral examination covering all material covered in course
2)assignments and individual project

PROGRAMMA ESTESO

Rocket Nozzles and Thrust

Performance and nozzle design. Convective Heat Transfer

Combustion and Thermochemistry

Perfect gas law and thermodynamics review, equilibrium Thermochemistry, adiabatic flame temperature calculations, non-Equilibrium Flows. Rocket nozzle thermochemistry.

Solid Rocket Motors

General description, interior ballistics, component design goals and constraints.

Liquid Rocket Motors

General description, engine cycles, power balance calculations, component design fundamentals. Combustion of Liquid Propellants ; Injection and Mixing ; Stability; Pressurization and Pump Cycles; Turbomachinery Performance

Trajectory Analysis and staging

The rocket equation, vertical trajectories, multistage rockets.

Electric Propulsion

General description and classification of electric propulsion systems, performance analysis.

Hybrid rockets

TESTI DI RIFERIMENTO

- Aerothermodynamics of Gas Turbine and Rocket Propulsion Gordon C. Oates eISBN: 978-1-60086-134-5 print ISBN: 978-1-56347-241-1 DOI: 10.2514/4.861345
- Hill, P., and Peterson, C., Mechanics and Thermodynamics of Propulsion, Addison-Wesley Publishing Co., 1992,
- George P. Sutton, Oscar Biblarz, Rocket Propulsion Elements, 7th Edition John-Wiley & Sons, Ltd., ISBN: 0-471-32642-9