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 2020/2021
Erogato nel 2020/2021

Anno di corso 1
Lingua INGLESE
Percorso Percorso comune
Docente Maria Grazia DE GIORGI
Sede Brindisi
Periodo Secondo 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. 5 Develop skills in planning and presentation of scientific talks and reports.
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
Classification, Challenges, and Advantages of Hybrids

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
- Course note