AEROSPACE ENGINEERING (LM52)

(Brindisi - Università degli Studi)

Insegnamento SPACE MISSION PROJECT AND SYSTEMS (MOD.2) C.I.

GenCod A006606

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Insegnamento SPACE MISSION PROJECT AND SYSTEMS (MOD.2) C.I.

Insegnamento in inglese SPACE MISSION PROJECT AND SYSTEMS

Settore disciplinare ING-IND/05

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 Primo Semestre

Tipo esame Orale

Valutazione

Orario dell'insegnamento https://easyroom.unisalento.it/Orario

BREVE DESCRIZIONE DEL CORSO

The objective of this course is to demonstrate the crucial factors, and potential advantages of space missions, while equipping students with the necessary tools for their conceptualization and development.
Space systems fall within the encompassing framework of the space mission, which will undergo comprehensive analysis through the examination of mission architecture, its constituent elements, and their interconnections.

PREREQUISITI

Courses at the undergraduate level encompassing the fields of physics, vector analysis, and

OBIETTIVI FORMATIVI

Students will gain an understanding of the complexities associated with the use of the space environment as a scientific and commercial sphere.
Students will also gain an insight into the geopolitical dynamics of space.
By the end of the course, students should be able to

- Evaluate the objectives of space missions
- Design the mission to achieve the objective
- Evaluate competing projects.

Students will learn to communicate effectively with professionals from other disciplines.

METODI DIDATTICI

– Lessons, exercises and workshops
– During the course, a project is proposed: students, divided into small groups, will be asked to design different elements/systems for a space mission. The project work is, in effect, a project laboratory: students must apply the knowledge acquired in-class hours to design the assigned task.
– Various design support tools, such as physical modelling (i.e. FREECAD, FUSION360) and some mathematical modelling (i.e. MODELICA/PYTHON/ EXCEL), will be used for the different types of analysis provided.

MODALITA' D'ESAME	– Learning is verified through an oral examination of the topics covered during the project work. – The student is invited to present his copy of the final report, of which he/she will be asked to discuss a presentation. The report must be compulsorily submitted at the end of the course.
PROGRAMMA ESTESO	– Types of space missions and their aims – Applied orbital mechanics, including interplanetary trajectories and Rendez-vous in space – Space environment – General concepts of space vehicle architecture (i.e., spacecraft, launchers, space stations, sub-orbital platforms) – Launchers Market – Selected onboard systems – Spacecraft Examples: Space Shuttle, Space Station, Tethered Satellite, the Hubble Space Telescope.
TESTI DI RIFERIMENTO	The instructional resources, curated by the educator and accessible on the teaching portal's course page, are composed in the English language. Some bibliography: - Space Mission Analysis and Design (SMAD), 3rd Edition, W.J. Larson and J.R. Wertz, Space Technology Library, Vol. 8 - Elements of Spacecraft Design, C.D. Brown, AIAA Education Series Mission Geometry; Orbit and Constellation Design and Management, - J.R. Wertz et alii, Space Technology Library, Vol. 13 Human Spaceflight; Mission analysis and Design, - W.J. Larson, Space Technology Series, McGraw Hill - ECSS standards (http://www.ecss.nl/) - NASA System Engineering Handbook, NASA/SP-2007-6105, Rev1.