

# AEROSPACE ENGINEERING (LM52)

(Brindisi - Università degli Studi)

## Insegnamento DESIGN AND TESTING OF POWER CONVERTERS AND ELECTRICAL MACHINES

GenCod A005678

**Insegnamento** DESIGN AND TESTING OF POWER CONVERTERS AND

**Insegnamento in inglese** DESIGN AND TESTING OF POWER CONVERTERS AND

**Settore disciplinare** ING-IND/32

**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** CURRICULUM AEROSPACE SYSTEMS

**Docente** Marco PALMIERI

**Sede** Brindisi

**Periodo** Primo Semestre

**Tipo esame** Orale

**Valutazione** Voto Finale

**Orario dell'insegnamento**

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

### BREVE DESCRIZIONE DEL CORSO

The course introduces the main components of an aeronautical electrical system, with a particular focus on power electronics converters and electrical machines.

### PREREQUISITI

Fundamentals of physics.  
Fundamentals of electrotechnics.  
Fundamentals of electric measurements theory.

### OBIETTIVI FORMATIVI

At the end of the course the student will know the main aeronautical electrical system components used to generate, distribute and consume the electric energy on board the aircraft. The autonomy of judgment will be developed both by deepening the design of the experiments and by the critical analysis of experimental data. The part of the course dedicated to the exercises includes group work. Communication skills and learning abilities will also be verified during the oral examination.

### METODI DIDATTICI

Whole class teaching (lectures).  
Computer-aided simulations and laboratory experiences.

### MODALITA' D'ESAME

Oral exam (plus written report on the laboratory experiences)

### APPELLI D'ESAME

### ALTRE INFORMAZIONI UTILI

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## PROGRAMMA ESTESO

Introduction, electric power evolution in aircraft electrical systems and main components of the electrical system.  
AC\DC electric power conversion.  
DC\DC electric power conversion.  
DC\AC electric power conversion.  
DC Electrical machines (generators\motors)  
AC Electrical machines (generators\motors)  
Standards for testing aeronautical electrical and electronic components and documentation for the qualification of an aeronautical devices  
Laboratory experiences  
Computer-aided modeling, simulation and analysis of power converters  
Computer-aided modeling, simulation and analysis of electrical machines

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## TESTI DI RIFERIMENTO

M. Rashid: "Power electronics Devices, circuits and applications" – Pearson  
N. Mohan, T. Undeland, W. Robbins: "Power Electronics: Converters, Applications and Design" – Wiley  
A. Fitzgerald: "Electric machinery" – Mc Graw Hill  
G. Conte: "Macchine elettriche" - Hoepli  
I. Moir, A. Seabridge "Aircraft Systems: Mechanical, Electrical and Avionics Subsystems Integration" – Wiley.  
USA Department of Transportation, Federal Aviation Administration, "Aviation Maintenance Technician Handbook"