



INTRODUCTION TO ELECTRICAL MACHINES

Enrollment year	2020/2021
Academic year	2021/2022
Regulations	DM270
Academic discipline	ING-IND/32 (POWER ELECTRONIC CONVERTERS, ELECTRICAL MACHINES AND DRIVES)
Department	DEPARTMENT OF ELECTRICAL, COMPUTER AND BIOMEDICAL ENGINEERING
Course	INDUSTRIAL ENGINEERING
Curriculum	Meccanica
Year of study	2°
Period	2nd semester (07/03/2022 - 17/06/2022)
ECTS	6
Lesson hours	54 lesson hours
Language	Italian
Activity type	WRITTEN TEST
Teacher	BENZI FRANCESCO (titolare) - 6 ECTS
Prerequisites	Basic knowledge of electrical engineering and circuit theory.
Learning outcomes	The course aims to provide the basic knowledge of electrical machines employed in industry and in electrical power systems. An namely: the thermal behaviour and types of service according to the standard; role of transformers and motors in industrial plants; knowledge of the operating principles and their sizing with respect to the relative loads.
Course contents	Electric machines for industrial applications Role and features of electrical machines in industry and power systems. The materials used, the sources of loss, the relative thermal problems. Types of service and rated characteristics. - Power transformers Transformer operating principle. Ideal and real transformer.

	Three-phase transformers. Transformer equivalent circuit. Power, torque and efficiency. - The induction machine The rotating magnetic field. Operating principle of the induction machine. Operation as a motor. Equivalent circuit of the induction machine. Mechanical and current characteristics. Starting techniques. ONLY FOR THE STUDENTS IN ENERGY. - Single-phase asynchronous machine. - Speed regulation. Notes on the variable frequency power supply of the induction machine and the flux constant speed regulation.
Teaching methods	Two-thirds of lectures. A third of numerical exercises.
Reccomended or required readings	The lecture notes and numerous numerical exercises with solutions are made available by the teacher through the Kiro platform.
Assessment methods	A written test, consisting consists of a numerical resolution of one or more exercises. Possible oral integration at the request of the student.
Further information	
Sustainable development goals - Agenda 2030	\$lbl_legenda_sviluppo_sostenibile