

General information	
Academic subject	Principles of Electrical Engineering and Automatic Control
Degree course	Science and Management of Maritime Activities
Academic Year	First year
European Credit Transfer and Accumulation System (ECTS)	12
Language	Italian
Academic calendar (starting and ending date)	Second semester
Attendance	No

Professor/ Lecturer	
Name and Surname	Graziano De Scisciolo
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Telephone	-
Department and address	-
Virtual headquarters	Microsoft Teams
Tutoring (time and day)	On appointment

Syllabus	
Learning Objectives	Know and understand the fundamentals of electrical engineering and its main fields of application, with particular attention to regulatory aspects relating to machines, electrical systems, electrical safety and automatic control. Be able to transfer the knowledge acquired in areas of professional operational practice.
Course prerequisites	Linear algebraic and differential equation systems. Trigonometry. Matrices and vectors. Complex Numbers. General Physics.
Contents	<ul style="list-style-type: none"> • Analyze DC LTI resistive circuits • Reduce any given LTI circuit to its Thevenin's or Norton's Equivalent • Analyze Transient Response of RL , RC Series • Resolve AC circuits using phasor techniques • Understand the Principle of Operation of DC/AC Machines • Identify Transformers and Their Performance • Analyze Three Phase Circuits • Understand the basic principles of AC power distribution and of electrical safety • Introduction to concept of dynamical system together with its mathematical representations. • Introduction to output feedback control. Block algebra • Feedback systems performance: transient and steady state. • Knowledge of the main performance requirements of feedback systems
Books and bibliography	• Giorgio Rizzoni. Elettrotecnica. Principi ed applicazioni, Mc Graw– Hill.
Additional materials	<ul style="list-style-type: none"> • Didactic material produced by the teacher during the lessons (files on IWB) • Didactic material deposited in the space dedicated to the course on the platform: https://mariscuola-ta.elearningmarina.difesa.it

Work schedule			
Total	Lectures	Hands on (Laboratory, working groups, seminars, field trips)	Out-of-class study hours/ Self-study hours
300	96		204
ECTS			
12	12		
Teaching strategy		Standard lectures. Practice lectures with complete solution of problems.	
Expected learning outcomes			

<p>Knowledge and understanding on:</p>	<ul style="list-style-type: none"> • Analyze DC LTI resistive circuits • Reduce any given LTI circuit to its Thevenin's or Norton's Equivalent • Analyze Transient Response of RL , RC Series • Risolve AC circuits using phasor techniques • Understand the Principle of Operation of DC/AC Machines • Identify Transformers and Their Performance • Analyze Three Phase Circuits • Understand the basic principles of AC power distribution and of electrical safety • Knowledge of the concept of dynamical system together with its mathematical representations. • Knowledge of the concept of feedback control of dynamical systems • Knowledge of the main performance requirements of feedback systems
<p>Applying knowledge and understanding:</p>	<ul style="list-style-type: none"> • Knowledge and understanding of the fundamentals of Electrical Engineering and Automatic control transferred to application areas specific to professional operational practice, with particular attention to the procedures of operation and maintenance of machines and electrical systems.
<p>Soft skills</p>	<ul style="list-style-type: none"> • <i>Making informed judgments and choices</i> Acquisition and development of critical study skills as regards Electrical Engineering gained through the reflection on the discipline contents and its application in operational professional practices. This process will be supported by the learners' operational experience. • <i>Communicating knowledge and understanding</i> Acquisition of the ability to expose the main technical-operational contents of the discipline in order to communicate them in moments of sharing. • <i>Capacities to continue learning</i> Acquisition of a learning method for both the knowledge and professional use of Electrical Engineering so as to have access to the consultation of technical regulations related to your professional field.

<p>Assessment and feedback</p>	
<p>Methods of assessment</p>	<p>Written test and optional oral discussion.</p>
<p>Evaluation criteria</p>	<ul style="list-style-type: none"> • <i>Knowledge and understanding</i> <ul style="list-style-type: none"> • Knowledge of elements of topology of a circuit and Kirchhoff's laws; ability to correctly express LKC/LKT. • Knowledge of Ohm's law and the fundamental combinations of resistors. • Ability to analyze simple LTI circuits in stationary or sinusoidal electrical regime. • Ability to analyze simple LTI three-phases circuits (symmetrical and balanced). • Be able to dynamically study a first-order LTI circuit. • Knowledge of the Principles of Electromechanics. • Knowledge of the concept of electrical risk and the effects of electric current on the human body. <ul style="list-style-type: none"> • Knowledge of the concept of dynamical system together with its mathematical representations. • Knowledge of the concept of feedback control of dynamical systems • <i>Applying knowledge and understanding</i> <ul style="list-style-type: none"> • Be able to establish a link between learning and its practice. Recognize the main measures to protect against electrical hazards. • <i>Making informed judgments and choices</i> <ul style="list-style-type: none"> • Operate with awareness and consideration in operating conditions characterized by the presence of electrical equipments and systems. • <i>Communicating knowledge and understanding</i> <ul style="list-style-type: none"> • Be able to describe, with clarity and technical language properties,

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	<p>settings involving the presence of electricity or electrical accidents.</p> <ul style="list-style-type: none">• <i>Capacities to continue learning</i><ul style="list-style-type: none">• Be able to continue studying electrical disciplines autonomously during the degree course.
Criteria for assessment and attribution of the final mark	The final evaluation is expressed in accordance with the evaluation criteria. It is expressed with a mark out of thirty, with possible honors where the candidate has shown autonomy of judgment and an adequate capacity for argumentation. The exam is passed when the grade is greater than or equal to 18/30.
Additional information	-