

Module Title: Laboratory Physics II

- **Type of Module:**

x	PC (Prescribed Core Module)
	PS (Prescribed Stream Module)
	ES (Elective Stream Module)
	E (Elective Module)

- **Level of Module: Compulsory**

- **Year of Study**

1^o

- **Semester**

2^o

- **Number of credits allocated**

6 (together with the course of Physics II)

- **Name of lecturer / lecturers : Associate Professor Kostas Papageorgiou
Dr. G. Maistros**

COURSES		OUTLINE AND LEARNING OBJECTIVES	
		➤	Introductory course. Electrical measurements. Instruments for electrical measurements. General characteristics and classification of the instruments for electrical measurements. Electrical measurements of voltage and current. Resistance color code. Method of Least squares.
1		➤	Current scale - Laplace force. Experimental verification and measurement of the Laplace force
2		➤	Joule's law – Calorimetry. Experimental verification of the Joule's law.
3		➤	Electrical measurements. Resistance connections. Experimental verification of the Ohm's law. Whetstone bridge and measurement of the value of an unknown resistance.
4		➤	Study of an electrical RLC circuit in serial and parallel resonance
5		➤	Study of the magnetic field of a solenoid. Measurement of the magnetic field using a second solenoid as a probe. Magnetic force acting on a current-

	carrying conductor.
6	➤ Oscilloscope. Familiarity of the undergraduate students with the basic functions and the usage of the oscilloscope for the measurement of continuous and alternating voltage, frequency and phase difference between two waveforms. Study of the beat and measurement of its characteristics. Lissajous curves.

BIBLIOGRAPHY

The laboratory physics exercises are based on the book of:

- **K. Papageorgiou, I. Gkialas, K. Theodosiou** “ *Laboratory Physics II , Electromagnetism* ”, University of the Aegean, Department of Financial and Management Engineering

Description

The Laboratory Physics II covers all the basic topics of Classical and Modern Physics in the field of the electromagnetism. More specifically the following topics are analyzed and studied thoroughly: Current scale and the Laplace force. Experimental verification and measurement of the Laplace force. Experimental verification of the Joule’s law. Experimental verification of the Ohm’s law. Whetstone bridge and measurement of the value of an unknown resistance. Study of an electrical RLC circuit in serial and parallel resonance. Study of the magnetic field of a solenoid. Magnetic force acting on a current-carrying conductor. Familiarity of the undergraduate students with the basic functions and the usage of the oscilloscope. Study of the beat and measurement of its characteristics. Lissajous curves.

Module Objective (preferably expressed in terms of learning outcomes and competences):

The main objective of the Laboratory Physics II (electromagnetism) is to present to the undergraduate students with an easy and scientific way all the basic concepts and principles of physics and further more to assist them to deeply understand those principles as well, through the experiments. Very important objective is also the challenge to cause the interest of the undergraduate students in experimental physics and at the same time to help familiarize themselves with all the modern experimental techniques for

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electrical measurements as well as with the usage of complex scientific instruments in the Laboratory. Additionally the preparation of a technical report or note is thoroughly analyzed and it is mandatory from the undergraduate students in every laboratory exercise in order to help them to develop all the required skills necessary in the science of the engineer.

- **Assessment Methods:**

- Oral examination 50%
- Technical reports 50%

The final score in the Laboratory Physics II represents the 30% of the total score in the course Physics II

- **Language of Instruction:** Greek

University of the Aegean

Department of Financial and
Management Engineering