

Course Specification Document

Title	Experimental Physics 1
--------------	------------------------

Credits	3.5 ECTS
----------------	----------

Aims	This course aims to acquaint the student with some laboratory equipment and alleviate the fear of handling them. It also aims to deepen some of the physical concepts related to the subject of the experiments, which contributes to his study of specialized engineering courses and later to his work practice.
-------------	--

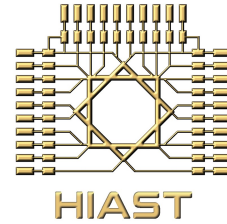
Intended learning outcomes

On successful completion of this course, the student will be able to:

- Recognize measurement techniques, the types of uncertainties resulting from measurement, and methods for calculating these uncertainties.
- Understand the working principle of tools for measuring geometric quantities and dimensions, or electrical quantities.
- Study the theoretical basis of various physical phenomena and how to achieve them experimentally.
- Use laboratory equipment well (oscilloscope, feeding blocks, measuring tools...).
- Use different types of paper in graphing (millimetric, logarithmic, semilogarithmic).
- Write a report of the practical session correctly.

Syllabus

- **Uncertainties:** Types of uncertainties and methods of calculating uncertainty.
- **Graph:** Graph and analyzing the results.
- **Measuring lengths:** Using the Vernier Caliper, Micrometer Screw Gauge, and Sphere Gauge.
- **Using some electrical measuring devices:** Using power supplies, current meters, voltmeters, and digital multimeters.
- **Ohm's Law:** Measurement of unknown resistance using Ohm's Law, studying the change in the resistance of a wire depending on its length, cross-sectional area, and material type.
- **Oscilloscope:** Use an alternating signal generator and display the signal on the oscilloscope, perform some measurements on the signal on the screen of the oscilloscope (amplitude measurement, frequency measurement), apply a capacitor charging and discharging circuit and display it on the oscilloscope.
- **Prism and spectrometer.**
- **Electric field lines.**
- **Cotton balance for magnetic field intensity measurement.**



- **Thermistor.**
- **Solar cells.**
- **Magnetic moment on a current loop.**
- **Measuring the angular speed of a motor.**
- **Measuring the ratio of an electron's charge to its mass.**
- **Weston Bridge.**
- **Diodes.**
- **Alternating current.**
- **Lenses.**
- **Specific heat capacitance.**
- **The simple pendulum.**
- **Absorption of infrared radiation.**
- **Torsional pendulum.**
- **The speed of sound.**