

F012	Elective 3 rd Year	General Physics Laboratory B	L	S	P	LE	ECTS 5
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Course objective. The aim of the course is to enable a student to independently perform experiments in the field of general physics. An additional goal is to learn how to process and physically interpret obtained results. Students will create an experiment report and statistically process the results. Also, students will use a computer when processing data of some experiments.

Prerequisites. Competences acquired by attending the courses “General Physics III and IV”.

Course content. Introduction to laboratory work (physical size and corresponding units of measurement, the concept, accuracy and record measurements, types of errors and measured results, graphical and tabular display of measurement, safety guide for the laboratory work).

List of experimental exercises (with possibility of choosing 10 of them):

1. Determination of the coil inductance
2. Determination of the capacity of the condenser
3. Geomagnetism, Balmer series
4. Electrolysis, conductivity of the electrolyte
5. Polarization, polarimetric measurement of the concentration of sugar solution, Photometry
6. Lenses
7. Electron diffraction, Determination of maximum energy beta radiation absorption in aluminium;
8. Stefan-Boltzmann law; Leslie cube
9. Latent heat of vaporization of water, Determination of the heat coefficient expansion of solids
10. Determination of the specific heat coefficient of petroleum, Determination of the adiabatic coefficient of air
11. Sound waves – properties. Determination of velocity of sound waves by Kundt tube
12. Colorimetry
13. Checking the laws of Physics in the Electronics Workbench programme
14. Millikan experiment

LEARNING OUTCOMES

No.	LEARNING OUTCOMES
1.	Independently conduct experiments in the field of general physics (handling measuring devices and instruments).
2.	Explain physical phenomena during the performed experiments (making a connection between physical laws and their application as well as cause and effect).
3.	Statistically analyse the results obtained by experiment, interpretation of the results.
4.	Use a computer to process the results.
5.	Make a detailed and complete laboratory report of the experiment.
6.	Critically use a scientific literature in which the measurement results are shown.

RELATING THE LEARNING OUTCOMES, ORGANIZATION OF THE EDUCATIONAL PROCESS AND ASSESSMENT OF THE LEARNING OUTCOMES

TEACHING ACTIVITY	ECTS	LEARNING OUTCOME **	STUDENT ACTIVITY*	EVALUATION METHOD	POINTS	
					min	max
Class attendance	0,5	1-6	Class attendance; Measuring and data processing	Evidence list	5	10
Performing the laboratory exercises	1	1-6	Measuring and data processing	Evidence list; Precision measurement and analysis of results, written verification of measurement results	10	30
Independent work	2	1-6	Theoretical preparation for experiments, writing reports	Oral test of preparation for the conducting of the experiment, examination of the students written preparation	20	40
Final exam	1,5	1-6	Performing certain exercises, data analysis and report writing	Written report and oral exam	15	20
TOTAL	5				50	100

Teaching methods and knowledge assessment.

Laboratory exercises are mandatory, but the student can justifiably abstain from two laboratory exercises, which is obliged to compensate for the foreseen time periods. Laboratory behaviour must be in accordance with the rules of operation in the laboratory, i.e. in a safe manner in which students are introduced at beginning of the semester and by signature they accept it. The final grade is determined on the basis of the knowledge demonstrated during the course, the mid-term evaluation of the completed experiment reports and the final exam.

Can the course be taught in English: Yes

Basic literature:

1. Interna skripta iz kolegija Praktikum iz osnova fizike B, dostupna na: <http://kolegij.fizika.unios.hr/pof2>

Recommended literature:

1. M. Požek, A. Dulčić; Fizički praktikum I i II, Sunnypress, Zagreb, 1999.
2. Paić, M. Fizička mjerenja I, II i III, Liber, Zagreb, 1988.

3. B. Marković, D. Miler, A. Rubčić, Račun pogrešaka i statistika, Liber, Zagreb, 1987.