



Univerza v Mariboru
University of Maribor

Fakulteta za naravoslovje in
matematiko / Faculty of Natural
Sciences and Mathematics



OPIS PREDMETA / SUBJECT SPECIFICATION

Predmet:	Fizikalni eksperimenti 2
Subject Title:	Physics experiments 2

Študijski program Study programme	Študijska smer Study field	Letnik Year	Semester Semester
Izobraževalna fizika Educational Physics		2	3

Univerzitetna koda predmeta / University subject code:

Predavanja Lectures	Seminar Seminar	Sem. vaje Tutorial	Lab. Vaje Lab. Work	Teren. vaje Field work	Samost. delo Individ. work	ECTS
			40		80	4

Nosilec predmeta / Lecturer:

Jeziki /	Predavanja / Lecture:	slovenski / Slovenian
Languages:	Vaje / Tutorial:	slovenski / Slovenian

Pogoji za vključitev v delo oz. za opravljanje študijskih obveznosti:

Prerequisites:

Vsebina:

Contents (Syllabus outline):

Študent opravi 15 zahtevnejših vaj s področja elektromagnetizma.

Students perform 15 advanced experiments from electromagnetism.

- Predavanja: teoretični pregled vsebin laboratorijskih vaj, na primerih predstavljeni didaktični pristopi pri izvedbi poskusov iz elektromagnetizma v šoli
- Vaje z elektromagnetizma vsebujejo: električna vezja, notranji upor, temperaturni koeficient upora, merilniki temperature, električnega toka in napetosti, indukcija in generatorji, elektromotorji, elektroni v električnem in magnetnem polju, Coulombov zakon, Millikanov poskus, Hallov pojav, pregled osnovnošolskih in srednješolskih poskusov iz elektromagnetizma.

- Lectures: theoretical overview of the experiments, introduction of didactical approaches of execution of experiments from electromagnetism based on examples
- The experiments on electromagnetism contain: electrical circuits, internal resistance, temperature- current- and voltage-meters, induction and generators, electromotors, electrons in electric and magnetic field, Coulomb law, Millikan experiment, Hall effect, an overview of primary and secondary school experiments from electromagnetism.

Temeljni študijski viri / Textbooks:

- 1) Navodila za izvedbo vaj/ Guidelines for the experiments
- 2) Sirkevič, Koškin: Priročnik elementarne fizike. Ljubljana: TZS, 1988.
- 3) D. Halliday, R. Resnick, K. S. Krane, Physics, 5. izdaja, vol 1 in 2 (John Wiley & Sons, Inc., New York, 2002).
- 4) J. Strnad, Fizika, 1. in 2. del, (DMFA, Ljubljana, 2002)
- 5) Na spletnih straneh Oddelka za fiziko objavljena elektronska gradiva./ teaching material published on websites of Department of Physics
- 6) Učbeniki za fiziko v osnovni in srednji šoli / Learning books of physics in primary and secondary school

Cilji:

- Študenti usvojijo osnovno eksperimentalno znanje s področja elektromagnetizma. Pridobijo si primerne izkušnje in laboratorijske spretnosti, potrebne za samostojno delo pri demonstracijah in eksperimentalnih vajah. Navadijo se uporabljati ustrezno strokovno literaturo, svoje teoretično in računsko znanje in tudi druge informacijske vire. Usvojijo znanja, potrebna za pripravo kvalitativnega in deloma kvantitativnega eksperimenta. Usposobijo se precizno in adekvatno poročati o svojih eksperimentalnih ugotovitvah.

Predvideni študijski rezultati:
Znanje in razumevanje:

Razumevanje osnovnih procesov v naravi in sposobnost njihove demonstracije v primerno opremljenem laboratoriju.

Prenesljive/ključne spretnosti in drugi atributi:

Didaktični pristop pri obravnavi naravnih pojavov ter sposobnost prenesti znanje učencu.

Metode poučevanja in učenja:

- Predavanja
- Laboratorijske vaje
- Individualno delo

Načini ocenjevanja:

- Opravljene laboratorijske vaje, izdelan dnevnik vaj in ustni zagovor vaj (30%)
- Ustno preverjanje pripravljenosti na vajo (20%)
- Pisni kolokvij (20%)
- Ustni in praktični izpit (30%)

Delež (v %) /
Weight (in %)

30

20

20

30

Objectives:

- Students refresh and extend the basic experimental knowledge from electromagnetism. They also acquire experiences and laboratory skills that are essential for an autonomous execution of demonstrative physics experiments. Finally, they learn how to use their theoretical and practical knowledge, as well as information offered from secondary sources, to master problems that might occur during experimental work and report on their findings. They are able to prepare qualitative and partially quantitative experiments.

Intended learning outcomes:
Knowledge and Understanding:

Understanding of basic processes in nature and the ability to demonstrate them in an appropriately equipped laboratory.

Transferable/Key Skills and other attributes:

A didactic approach to real-life phenomena and the ability to transfer this knowledge to students.

Learning and teaching methods:

- Lectures
- Laboratory excersises
- Individual work

Assessment:

- Done experiments and the lab diary and the oral avocation of the experiments (30%)
- Oral assessment of readiness for the forthcoming experiment (20%)
- Written test (20%)
- Oral and practical exam (30%)

Materialni pogoji za izvedbo predmeta :

- Predavalnica
- Laboratorij

Material conditions for subject realization

- Lecture hall
- Laboratory

Obveznosti študentov:

(pisni, ustni izpit, naloge, projekti)

- Opravljene laboratorijske vaje, izdelan dnevnik vaj in ustni zagovor vaj
- Ustno preverjanje pripravljenosti na vajo

Students' commitments:

(written, oral examination, coursework, projects):

- Done experiments and the lab diary and the oral avocation of the experiments
- Oral assessment of readiness for the

• Pisni kolokvij • Ustni in praktični izpit	• forthcoming experiment • Written test • Oral and practical exam
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