Univerza v Mariboru

FAKULTETA ZA NARAVOSLOVJE IN MATEMATIKO
Koroška cesta 160
2000 Maribor, Slovenija
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UČNI NAČRT PREDMETA / SUBJECT SPECIFICATION

Predmet:	Osnovna merjenja
Subject Title:	Basic measurements

Študijski program Study programme	Študijska smer Study field	Letnik Year	Semester Semester
Fizika Physics		1	**1**

Univerzitetna koda predmeta / University subject code:

Predavanja Lectures	Seminar Seminar	Sem. vaje Tutorial	Lab. vaje Labor work	Teren. vaje Field work	Samost. delo Individ. work	ECTS
			30		60	**3**

Nosilec predmeta / Lecturer: Andrej Dobovišek

Jeziki / Languages:	**Predavanja / Lecture:**	Slovenski/Slovene
	Vaje / Tutorial:	Slovenski/Slovene

Pogoji za vključitev v delo oz. za opravljanje študijskih obveznosti:	**Prerequisits:**
Jih ni	none

Vsebina:	**Content (Syllabus outline):**
Predavanja: osnove merjenjenja in obdelave dobljenih podatkov. Lab. vaje: 1. Merjenje gostote trdnih teles 2. Merjenje prostornine in gostote kapljevin 3. Merjenje koeficienta vzmeti 4. Merjenje debeline 5. Merjenje krivinskega polmera leč 6. Mikroskopsko merjenje majhnih dimenzij 7. Merjenje frekvence 8. Merjenje električnega upora 9. Merjenje električnega toka in električne napetosti 10. Meritve svetlobnega toka 11. Merjenje temperature 12. Obdelava merskih podatkov s programskimi paketi kot so npr: Mathematica, Origin in Excel	Lectures: measurements and data processing. Lab work: 1. Measurements of density of solid bodies 2. Measurements of volume and density of fluids 3. Measurements of spring constant 4. Measurements of thickness 5. Measurements of curvature radius of lenses 6. Microscopic measurements of small dimensions 7. Measurements of frequency 8. Measurements of electrical resistance 9. Measurements of electrical current and voltage 10. Measurements of light flux 11. Measurements of temperature 12. Analysis of experimental data with software packages like: Mathematica, Origin and

13. Kinematika: merjenje z računalniškim merilnim sistemom.	Excel 13. Kinematics: Computer directed measurements

Temeljni literatura in viri / Textbooks:

1) Interna navodila za izvedbo vaj/ Guidelines for the experiments
2) Sirkevič, Koškin: *Priročnik elementarne fizike*. Ljubljana: TZS, 1988.
3) D. Halliday, R. Resnick, J. Walker, Fundamentals of Physics, 5. izdaja, (John Wiley & Sons, Inc., New York, 1997)
4) J. Strnad, Fizika, 1. del, (DMFA, Ljubljana, 2002)

Cilji:	**Objectives:**
Študentje osvojijo osnovna teoretična in praktična znanja s področja merjenja. 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 kvantitativnega in kvalitativnega eksperimenta. Usposobijo se precizno in adekvatno poročati o svojih eksperimentalnih ugotovitvah.	Students acquire elemental theorethical and practical knowledge from the field of meauremets . Also, students acquire experiences and laboratory skills that are essential for an autonomous execution of demonstrative physics experiments related to above-outlined topics. 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.

Predvideni študijski rezultati:	**Intended learning outcomes:**
Znanje in razumevanje: Poznavanje osnovnih meritev v fiziki. **Prenesljive/ključne spretnosti in drugi atributi:** Usposobljenost za delo v fizikalnem laboratoriju pri nadaljevalnih laboratorijskih vajah.	Knowledge and Understanding: Knowledge of basic measurements in physics. **Transferable/Key Skills and other attributes:** Ability to work in the physics lab at the advanced physical experiments.

Metode poučevanja in učenja:	**Learning and teaching methods:**
Metodika obsega: teoretičen uvod v obravnavano snov ter samostojno izvedbo eksperimentov pod mentorstvom profesorja.	They are based on: theoretical introduction to specific topics and an autonomous execution of experiments under the supervision of the professor.

Načini ocenjevanja:	Delež (v %) / Weight (in %)	**Assessment:**
Opravljene laboratorijske vaje in izdelan dnevnik vaj	**25 %**	Done experiments and written experimental reports
Pisni kolokvij	**25 %**	Written exam
Ustni in praktični izpit	**50 %**	Oral and practical exam

Reference nosilca / Lecturer's references:

1. DOBOVIŠEK, Andrej, FAJMUT, Aleš, BRUMEN, Milan. Strategy for NSAID administration to aspirin-intolerant asthmatics in combination with PGE [sub] 2 analogue: a theoretical approach. *Med. biol. eng. comput.*. [Print ed.], 2012, vol. 50, no. 1, str. 33-42, doi:10.1007/s11517-011-0844-x. [COBISS.SI-ID 18845192]

2. DOBOVIŠEK, Andrej, ŽUPANOVIĆ, Paško, BRUMEN, Milan, BONAČIĆ LOŠIĆ, Željana, KUIĆ, Domagoj, JURETIĆ, Davor. Enzyme kinetics and the maximum entropy production principle. *Biophysical chemistry*. [Print ed.], 2011, vol. 154, iss. 2/3, str. 49-55,

doi: 10.1016/j.bpc.2010.12.009. [COBISS.SI-ID 18206984]

3. DOBOVIŠEK, Andrej, FAJMUT, Aleš, BRUMEN, Milan. Role of expression of prostaglandin synthases 1 and 2 and leukotriene C [sub] 4 synthase in aspirin-intolerant asthma: a theoretical study. *Journal of pharmacokinetics and pharmacodynamics*, 2011, vol. 38, no. 2, str. 261-278, doi: 10.1007/s10928-011-9192-6. [COBISS.SI-ID 18203144]

4. ŽUPANOVIĆ, Paško, KUIĆ, Domagoj, JURETIĆ, Davor, DOBOVIŠEK, Andrej. On the problem of formulating principles in nonequilibrium thermodynamics. *Entropy (Basel, Online)*, 2010, vol. 12, no. 4, str. 926-931. http://www.mdpi.com/1099-4300/12/4/926/pdf, doi: 10.3390/e12040926. [COBISS.SI-ID 17555976]

5. BRUMEN, Milan, FAJMUT, Aleš, DOBOVIŠEK, Andrej, ROUX, Etienne. Mathematical modelling of Ca[sup]2+ oscillations in airway smooth muscle cells. *Journal of biological physics*, 2005, 31, str. 515-524. [COBISS.SI-ID 14363656]

6. FAJMUT, Aleš, DOBOVIŠEK, Andrej, BRUMEN, Milan. Mathematical modeling of the relation between myosin phosphorylation and stress development in smooth muscles. *J. chem. inf. mod.*, 2005, [Vol.] 45, str. 1610-1615. [COBISS.SI-ID 14353672]

7. FAJMUT, Aleš, DOBOVIŠEK, Andrej, BRUMEN, Milan. Mathematical modelling in aspirin-induced asthma : theory and clinical applications. V: BISLIMI, Adelina H. (ur.), TOLKA, Lulezime C. (ur.). *Asthma : causes, complications and treatment*, (Pulmonary and respiratory diseases and disorders). New York: Nova Science Publishers, cop. 2012, str. 1-32. [COBISS.SI-ID 19556360]