



Univerza v Mariboru

Fakulteta za naravoslovje
in matematiko

UČNI NAČRT PREDMETA / COURSE SYLLABUS

Predmet:	Praktično usposabljanje 2
Course title:	Practical qualifying 2

Študijski program in stopnja Study programme and level	Študijska smer Study field	Letnik Academic year	Semester Semester
Fizika, 1. stopnja		3	6
Physics, 1st cycle			

Vrsta predmeta / Course type

izbirni/elective

Univerzitetna koda predmeta / University course code:

Predavanja Lectures	Seminar Seminar	Vaje Tutorial	Lab. vaje Laboratory work	Terenske vaje Field work	Samost. delo Individ. work	ECTS
	15				165	6

Nosilec predmeta / Lecturer:

Mitja Slavinec

Jeziki /

Predavanja / Lectures:

slovenski/Slovenian

Languages:

Vaje / Tutorial:

slovenski/Slovenian

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

Ni pogojev za vključitev v delo.

Vsaka izmed naštetih obveznosti v načinih ocenjevanja mora biti opravljena s pozitivno oceno. Opravljen projekt je pogoj za pristop k ustnemu izpitu.

Prerequisites:

No prerequisites to join the course.

Each of the listed obligations in the assessment methods must be completed with a positive grade. Completed project is a prerequisite for taking the oral exam.

Vsebina:

Na seminarju predstavimo pomen in delo v interdisciplinarni skupini. Podrobna vsebina seminarja se prilagaja glede na to, kam so študenti odšli na prakso. Študent se sam dogovori za prakso na inštituciji ali v podjetju na temo, ki je v povezavi s fiziko. Nosilec predmeta oceni

Content (Syllabus outline):

At the seminar we present the meaning and work in an interdisciplinary group. The detailed content of the seminar depends on the chosen institutions and firms, where students are practical qualifying. Students arrange the work at an institution or a firm according to their wishes. The chosen field

primernost prakse v obsegu 100 ur in jo odobri. Nekatere izmed možnosti so:

- diagnostika v medicini (RTG, NMR, CT), nuklearna medicina in obsevanja,
- fizikalna merjenja (zagotavljanje kakovosti, kibernetika, upravljanje in optimizacija delovnih procesov, preizkus kvalitete izdelkov),
- jedrski reaktor in izkoriščanje jedrske energije,
- analitične metode v fiziki in eksperimentalna tehnika, polarizacijski mikroskop, tunnelski mikroskop, mikroskop na elektronsko silo, NMR, spektroskopija),
- tekočerkristalne aplikacije,
- druga področja eksperimentalne fizike.

should be related to physics. Practical work is done at a firm or institution. Lecturer evaluates and approves the chosen practical work in the range of 100 hours.

Some of the possibilities are:

- Medical diagnostic (RTG, NMR, CT), nuclear medicine and ray therapy,
- Physical measuring (quality assured, cybernetics, administering operation, quality control),
- Nuclear reactor and nuclear energy,
- Analytical methods in physics and experimental technique (polarized microscope, tunnel microscope, electronic force microscope, NMR, spectroscopy),
- Liquid crystal applications,
- Other experimental physics methods.

Temeljni literatura in viri / Readings:

Učbeniki s področja obravnavanih tem, ki se bodo letno spreminjale. Literatura bo podana letno v spletni učilnici / Textbook on the topics chosen by students for their qualifying in practice. The list will change annually according to the students interests and will be given in the e-classroom.

Cilji in kompetence:

Študentje osvojijo praktična znanja in izkušnje, potrebna za kompleksnejše razumevanje fizikalnih pojavov, procesov in reševanje fizikalnih problemov na različnih delovnih področjih in v aplikacijah.

Objectives and competences:

Students conquest practical knowledge and experiences that are necessary for complex understanding of physical phenomena, processes and solving physical problems in different fields of activities and in applications.

Predvideni študijski rezultati:

Znanje in razumevanje:

Po uspešno zaključeni učni enoti študent:

- osvoji praktična znanja in izkušnje iz specifičnega področja,
- pridobi spretnosti o načinu prenosa znanja v prakso,
- prepozna pomen prenosa teoretičnega znanja v prakso,
- se seznani z realnim delovnim okoljem,
- načrtuje in vodi delo,
- natančno in strokovno poroča o opravljenem delu.

Intended learning outcomes:

Knowledge and understanding:

On completion of this course student will be able to:

- acquire practical knowledge and experience from a specific field,
- acquire skills about how to transfer theoretical knowledge into practice,
- recognizes the importance of transferring theoretical knowledge to practice,
- get acquainted with the real working environment,
- plans and manages work,

Prenesljive/ključne spretnosti in drugi atributi:

- Neposredna vključitev v uporabo fizike v gospodarstvu in drugih dejavnostih.
- Razvoj spretnosti samostojnega in skupinskega strokovno raziskovalnega dela.
- Razvoj poklicno specifičnih kompetenc in kompetence podjetnosti.
- Razvoj komunikacijskih spretnosti.

- report precisely and professionally about the work done.

Transferable/Key Skills and other attributes:

- Direct involvement of students to physics application in economic organizations and firms.
- Development of skills of individual and group professional research work.
- Development of professionally-specific competences and competence of entrepreneurship.
- Development of communication skills.

Metode poučevanja in učenja:

Seminar: teoretičen uvod v aplikativno uporabo fizikalnih znanj v različnih področjih dela (razlaga, razgovor, demonstracija, študija primera)
Individualizacija učenja.

Learning and teaching methods:

Seminar: theoretical introduction on applicative use of physical knowledge on different fields of activity (explanation, discussion, demonstration, case study)
Individualization in teaching.

Načini ocenjevanja:

Delež (v %) /

Weight (in %)

Assessment:

projekt
ustni izpit

80
20

project
oral exam

Reference nosilca / Lecturer's references:

KLEMENČIČ, Eva, ZAVEC PAVLINIČ, Daniela, SLAVINEC, Mitja. Modelling the impact of moisture on the thermal conductivity of cotton jersey. *Fibres & textiles in Eastern Europe : an international magazine devoted to current problems of the textile industries in Central and Eastern Europe*. 2021, vol. 29, iss. 2 (146), str. 61-65. ISSN 1230-3666. <http://www.fibtex.lodz.pl/article2286.html>, DOI: [10.5604/01.3001.0014.6083](https://doi.org/10.5604/01.3001.0014.6083). [COBISS.SI-ID [60647427](https://www.cobiss.si/record/60647427)]

HÖLBL, Arbresha, PAL, Kaushik, SLAVINEC, Mitja, KRALJ, Samo. Slave-master mechanism of thermotropic liquid crystal phase transitional behavior. *Physica. B, Condensed matter*. [Print ed.]. Oct. 2022, vol. 642, str. 1-8. ISSN 0921-4526. DOI: [10.1016/j.physb.2022.414142](https://doi.org/10.1016/j.physb.2022.414142). [COBISS.SI-ID [117878531](https://www.cobiss.si/record/117878531)]

LI, Wen-Jing, JIANG, Luo-Luo, CHEN, Zhi, PERC, Matjaž, SLAVINEC, Mitja. Optimization of mobile individuals promotes cooperation in social dilemmas. *Chaos, solitons and fractals*. [Print ed.]. Dec. 2020, vol. 141, str. 1-7. DOI: [10.1016/j.chaos.2020.110425](https://doi.org/10.1016/j.chaos.2020.110425). [COBISS.SI-ID [37159939](https://www.cobiss.si/record/37159939)]