Univerza v Mariboru

Fakulteta za naravoslovje in matematiko

UČNI NAČRT PREDMETA / COURSE SYLLABUS	
Predmet:	**Praktično usposabljanje 1**
Course title:	**Practical qualifying 1**

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 / Languages:		
	Predavanja / Lectures:	slovenski/Slovenian
	Vaje / Tutorial:	slovenski/Slovenian

Pogoji za vključitev v delo oz. za opravljanje študijskih obveznosti:	**Prerequisites:**
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.	There are 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:	**Content (Syllabus outline):**
Na seminarju so predstavljene možne aplikacije fizike v gospodarstvu in negospodarstvu. Predstavi se pisanje poročila o opravljenem delu. Podrobna vsebina seminarja se prilagaja glede na to, kje študentje opravljajo prakso. Študent se sam dogovori za prakso na inštituciji ali v podjetju na temo, ki je v	At the seminar, we present possible application of physics in industry and non-industry field. Students are acquainted with writing a report. Contents of seminar depend on the chosen institutions and firms, where students are practical qualifying.

povezavi s fiziko. Nosilec predmeta oceni 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, tunelski mikroskop, mikroskop na elektronsko silo, NMR, spektroskopija), - tekočekristalne aplikacije, - druga področja eksperimentalne fizike.	Students have to arrange the work at an institution or a firm according to their wishes. The chosen field should be related to physics. 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:	**Objectives and competences:**
Študentje osvojijo praktična znanja in izkušnje, potrebna za kompleksnejše razumevanje fizikalnih pojavov, procesov in reševanje fizikalnih problemov na različnih delovnih področjih in v aplikacijah.	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:	**Intended learning outcomes:**
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.	**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,

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.	• plans and manages work, • 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:	**Learning and teaching methods:**
Seminar: teoretičen uvod v aplikativno uporabo fizikalnih znanj v različnih področjih dela (razlaga, razgovor, demonstracija, študija primera) Individualizacija učenja.	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. [COBISS.SI-ID 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. [COBISS.SI-ID 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. [COBISS.SI-ID 37159939]