UČNI NAČRT PREDMETA / COURSE SYLLABUS	
Predmet:	**Računska fizika**
Course title:	**Computational physics**

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

Vrsta predmeta / Course type	Obvezni/Obligatory
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
45			**45**		**90**	**6**

Nosilec predmeta / Lecturer:	Matjaž Perc

Jeziki / Languages:	**Predavanja/ Lectures:**	slovenski / slovene
	Vaje / Tutorial:	slovenski / slovene

Pogoji za vključitev v delo oz. za opravljanje študijskih obveznosti:	**Prerequisits:**
Pogojev ni.	None.

Vsebina:	**Content (Syllabus outline):**
Zgradba in delovanje računalnika. Računalnik pri delu v fiziki:risanje diagramov: različne oblike diagramov, prilagoditvene krivulje, prikaz napak, združevanje diagramov, osnovne računske tehnike, odvajanje in integriranje z računalniškimi orodji, priprava fizikalnega teksta, urejevalniki enačb, predstavitve, shranjevanje in prenos podatkov med različnimi programi, pošiljanje podatkov, osnovne meritve z računalnikom, pregled računalniških orodij za fiziko.	Computer architecture and operation Computer in physics diagram drawing: diagram types, fitting curves, error presentation, diagram joining, basic computer techniques, numerical derivation and integration with the computer tools, physics text preparation, equation editors, presentation, data shearing, storing and transmission, computer easurement, physics software tools

Temeljni literatura in viri / Readings:

- Dušan Kodek: Organizacija in arhitektura računalniških sistemov, Fakulteta za elektrotehniko Ljubljana, Ljubljana, 1988.
- David A Patterson, John L. Hennesy: Computer Architecture A Quantitative Approach, Morgan Kaufman Publishers, INC. San Mateo, California, 1991.
- Tanenbaum Andrew S.: Structured Computer Organization, Third Edition, Prentice-Hall, 1990.

Ostala literatura, ki se zaradi hitro razvijajočega področja spreminja, bo podana na predavanjih.

Cilji in kompetence:	**Objectives and competences:**
Uporaba osnovnih računalniških orodij pri laboratorijskem delu in pri pisanju fizikalnih tekstov.	The application of software tools in laboratory work and creation of physics text.

Predvideni študijski rezultati:	**Intended learning outcomes:**
Znanje in razumevanje: Študent zna z računalniškimi orodji obdelati in prikazati rezultate meritev. Pri strokovnem pisanju uporablja računalnik. **Prenesljive/ključne spretnosti in drugi atributi:** Delo z računalnikom je posebej pomembno pri vseh laboratorijskih vajah, pri seminarjih in diplomski nalogi.	**Knowledge and understanding:** Student knows to work with the computer tools and evaluate the results. He/she uses computer in the physics vocation. **Transferable/Key Skills and other attributes:** Work with the computer in laboratory, seminar work and diploma papers.

Metode poučevanja in učenja:	**Learning and teaching methods:**
Predavanja Laboratorijsko del	Lectures Laboratory work

Načini ocenjevanja:	Delež (v %) / Weight (in %)	**Assessment:**
Način (pisni izpit, ustno izpraševanje, naloge, projekt):		Type (examination, oral, coursework, project):
Opravljene vaje	**50**	Done experiments
Ustni izpit	**50**	Oral exam
Za uspešno zaključeno učno enoto mora biti vsak del posebej pozitiven. Opravljene vaje so pogoj za pristop k ustnemu izpitu.		For a successfully finished course, both parts have to be positive. Done experiments are a prerequisite to access the oral exam.

Reference nosilca / Lecturer's references:

1. SZOLNOKI, Attila, PERC, Matjaž. Oppressed species can form a winning pair in a multi-species ecosystem. *Applied mathematics and computation*. [Print ed.]. Feb. 2023, vol. 438, str. 1-8. ISSN 0096-3003. DOI: 10.1016/j.amc.2022.127568. [COBISS.SI-ID 125126147]
2. İZGI, Burhaneddin, ÖZKAYA, Murat, ÜRE, Nazım Kemal, PERC, Matjaž. Extended matrix norm method : applications to bimatrix games and convergence results. *Applied mathematics and computation*. [Print ed.]. Feb. 2023, vol. 438, str. 1-11. ISSN 0096-3003. DOI: 10.1016/j.amc.2022.127553. [COBISS.SI-ID 123701251]
3. BAYANI, Atiyeh, JAFARI, Sajad, AZARNOUSH, Hamed, NAZARIMEHR, Fahimeh, BOCCALETTI, Stefano, PERC, Matjaž. Explosive synchronization dependence on initial conditions : the minimal Kuramoto model. *Chaos, solitons and fractals*. [Print ed.]. Apr. 2023, vol. 169, [article no.] 113243, 6 str. DOI: 10.1016/j.chaos.2023.113243. [COBISS.SI-ID 144690435]
4. BARAĆ, Uroš, PERC, Matjaž, GOSAK, Marko. Determinants of collective failure in excitable networks. *Chaos*. 2023, vol. 33, iss. 4, [article no.] 043120, 9 str. ISSN 1054-1500. DOI: 10.1063/5.0149578. [COBISS.SI-ID 149413891]
5. YESILKAYA, Bartu, SAYILGAN, Ebru, YUCE, Yilmaz Kemal, PERC, Matjaž, ISLER, Yalcin. Principal component analysis and manifold learning techniques for the design of brain-computer interfaces based on steady-state visually evoked potentials. *Journal of computational science*. Apr. 2023, vol. 68, [article no.] 102000, str. 1-9, tabele. ISSN 1877-7503. DOI: 10.1016/j.jocs.2023.102000. [COBISS.SI-ID 146916099]