Univerza v Novi Gorici
Fakulteta za naravoslovje

University of Nova Gorica
School of Science

UČNI NAČRT PREDMETA / COURSE SYLLABUS	
Predmet:	Analitična mehanika
Course name:	Analytical mechanics

Študijski program in stopnja Study program and level	Študijska smer Study field	Letnik Academic year	Semester Semester
Fizika in Astrofizika I. stopnja	/	2	1
Physics and Astrophysics I. level	/	2	1

Vrsta predmeta / Course type	obvezni / mandatory
Univerzitetna koda predmeta / University course code:	1FAF13

Predavanja Lectures	Seminar Seminar	Sem. vaje Tutorial	Lab. vaje Lab. work	Teren. vaje Field work	Samost. delo Indiv. work	ECTS
30	/	30	/	/	120	6

Nosilec predmeta / Lecturer:	Prof. dr. Giovanni De Ninno	
Jeziki / Languages:	**Predavanja / Lectures:**	slovenščina / English
	Vaje / Tutorial:	slovenščina / English

Pogoji za opravljanje študijskih obveznosti:	**Prerequisits:**
Fizika 1, Analiza 1	Physics 1, Analysis 1

Vsebina:	**Syllabus outline:**
Pregled osnovnih principov mehanike. Variacijski principi in Lagrangeve enačbe. Problem središčne sile. Kinematika gibanja togega telesa. Oscilacije. Klasična mehaniha posebne teorije relativnosti. Hamiltonove enačbe gibanja. Kanonične transformacije. Hamilton-Jacobijeva teorija in akcijske spremenljivke kota. Kanonične petrurbacije.	Survey of elementary principles of mechanics. Variational principles and Lagrange's equations. The central force problem. The kinematics of rigid body motion. The rigid body equations of motion. Oscillations. The classical mechanics of the special theory of relativity. The Hamilton Equations of Motion. Canonical transformations. Hamilton-Jacobi theory and action-angle variables. Canonical Perturbation.

Temeljni literatura in viri / Basic readings:
1. H. Goldstein: Classical mechanics (ed. Pearson) + lecture notes

Cilji in kompetence:	Objectives and competences:
Pregled osnovnih principov analitične mehanike s povdariom na Lagrangevih in Hamiltonovih pristopih ter ohranitvenih teoremih.	Overview of the basic principles of analytical mechanics, with emphasis on the Lagrange and Hamilton approaches and on conservation theorems.

Predvideni študijski rezultati:	Intended learning outcomes:
Trdno znanje osnovnih principov Lagrangeve in Hamiltonove mehanike.	Solid knowledge of the basic principles of Lagrangian and Hamiltonian mechanics.

Metode poučevanja in učenja:	Learning and teaching methods:
• - kolokviji, pisni izpit • - ustni izpit	50 50

Načini ocenjevanja:	Utež / Weight (%)	Assessment:
- kolokviji, pisni izpit - ustni izpit	50 50	- written tests, writen exam - oral exam

Reference nosilca / references of the course principal:

Prof. dr. Giovanni De Ninno je redni profesor za področje fizike na Univerzi v Novi Gorici. Professor Giovanni De Ninno is a full professor of physics at the University of Nova Gorica.

1. 1. ALLARIA, E., DE NINNO, Giovanni, GAUTHIER, David, et al. Two-colour pump-probe experiments with a twin-pulse-seed extreme ultraviolet free-electron laser. *Nature communications*, ISSN 2041-1723, maj 2013, vol. 4, str. 1-7, doi: 10.1038/ncomms3476. [COBISS.SI-ID 2887163]

2. 2. ALLARIA, Enrico, DE NINNO, Giovanni, GAUTHIER, David, SPAMPINATI, Simone, et al. Two-stage seeded soft-X-ray free-electron laser. *Nature photonics*, ISSN 1749-4885, 2013, vol. 7, no. 11, str. 913-918, doi: 10.1038/nphoton.2013.277. [COBISS.SI-ID 2928379]

3. 3. DE NINNO, Giovanni, MAHIEU, Benoît, ALLARIA, E., GIANNESSI, L., SPAMPINATI, S. Chirped seeded free-electron lasers : self-standing light sources for two-color pump-probe experiments. *Physical review letters*, ISSN 0031-9007. [Print ed.], 2013, vol. 110, no. 6, str. 064801-1-064801-5, doi: 10.1103/PhysRevLett.110.064801. [COBISS.SI-ID 2882299]

4. 4. ALLARIA, E., DE NINNO, Giovanni, et al. Highly coherent and stable pulses from the

FERMI seeded free-electron laser in the extreme ultraviolet. *Nature photonics*, ISSN 1749-4885, 2012, vol. 6, no. 10, str. 699-704, doi: 10.1038/nphoton.2012.233. [COBISS.SI-ID 2817787]

5. 5. DE NINNO, Giovanni, FANELLI, Duccio, Out-of-equilibrium statistical ensemble inequivalence. *Europhysics letters*, ISSN 0295-5075, 2012, vol. 97, no. 2, str. 20002-p1-20002-p5, doi: 10.1209/0295-5075/97/20002. [COBISS.SI-ID 2883323] [COBISS.SI-ID2620155]