

UČNI NAČRT PREDMETA / COURSE SYLLABUS						
Predmet:		Fizika 1				
Course title:		Physics 1				
Študijski program in stopnja Study programme and level		Študijska smer Study field		Letnik Academic year		Semester Semester
Univerzitetni študijski program Matematika		ni smeri		1		drugi
First cycle academic study programme Mathematics		none		1		second
Vrsta predmeta / Course type				obvezni		
Univerzitetna koda predmeta / University course code:				M0238		
Predavanja Lectures	Seminar Seminar	Vaje Tutorial	Klinične vaje work	Druge oblike študija	Samost. delo Individ. work	ECTS
45		45			90	6
Nosilec predmeta / Lecturer:				prof. Anton Ramšak		
Jeziki / Languages:		Predavanja / Lectures:		slovenski/Slovene		
		Vaje / Tutorial:		slovenski/Slovene		
Pogoji za vključitev v delo oz. za opravljanje študijskih obveznosti:				Prerequisites:		
Vsebina:				Content (Syllabus outline):		

<p>Mehanika. Gibanje točkastih teles. Galilejeva transformacija. Gibanje togega telesa. Newtonovi zakoni. Energija, gibalna količina, gibanje težišča. Sistemске sile. Gravitacija, potencialna energija. Gibanje planetov. Vrtilna količina, dinamika togega telesa. Statika. Nihanje različnih nihal, dušeno, vsiljeno in sklopljeno nihanje.</p> <p>Termodinamika. Povezava med klasično mehaniko in termodinamiko. Statistična interpretacija in termodinamska limita na primeru idealnega plina. Temperatura, notranja energija, toplota, energijski zakon. Entropija in entropijski zakon. Toplotni stroji.</p>	<p>Mechanics. Motion of particles. Galilean transformation. Motion of a rigid body. Newton's laws. Energy, momentum, center of gravity. System forces. Gravity, potential energy. Movement of the planets. Angular momentum, rigid body dynamics. Statics. Oscillations of various pendulums, damped, forced and coupled oscillations.</p> <p>Thermodynamics. The connection between classical mechanics and thermodynamics. Statistical interpretation and the thermodynamic limit in case of an ideal gas. Temperature, internal energy, heat, energy law. Entropy and the entropy law. Heat engines.</p>
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Temeljni literatura in viri / Readings:

<p>Izbrana poglavja iz knjig:</p> <p>J. Strnad: Fizika. Del 1, DMFA-založništvo, 1995.</p> <p>R. Kladnik: Osnove fizike : za tehnike. Del 1, Državna založba Slovenije, 1969.</p> <p>D. Halliday, R. Resnick, J. Walker: Fundamentals of Physics, John Wiley & Sons, 2005.</p>
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Cilji in kompetence:

<p>Poglobitev znanja iz osnov fizike s primeri, predstavljenimi z eksperimenti, kjer slušatelji spoznajo tudi metode merjenja različnih fizikalnih količin.</p>

Objectives and competences:

<p>Enhancement of knowledge of basic physics by cases, presented by experiments, where students also learn of different methods of measuring physical quantities.</p>

Predvideni študijski rezultati:

<p>Znanje in razumevanje: Razumevanje pojmov: sila, polje, potencial, energija, temperatura. Povezava med mehanskimi in termodinamičnimi količinami, ohranitev celotne energije v naravi. Uporaba: Pridobljeno znanje fizike služi slušateljem kot primer za uporabo matematičnih metod (sistem linearnih enačb, odvod, integral, diagonalizacija matrik).</p>
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Intended learning outcomes:

<p>Knowledge and understanding: Understanding of basic concepts: force, field, potential, energy, and temperature. The link between mechanical and thermodynamic quantities, the conservation of the total energy in nature. Application: Acquired knowledge of physics can be used for building examples for the use of mathematical models (systems of linear equations, derivative, integral, matrix</p>

<p>Refleksija: Uporaba matematičnega pristopa in formalizma na konkretnih fizikalnih primerih.</p> <p>Prenosljive spretnosti – niso vezane le na en predmet: Spoznavanje z metodologijo uporabe fizikalnih teorij pri opazovanju pojavov v naravi: postavitve teoretičnega modela, definiranje fizikalnih količin in spremenljivk, ki nastopajo v modelu, in primerjava z izmerjenimi količinami.</p>	<p>diagonalization).</p> <p>Reflection: The use of mathematical approach and formalism on concrete physical examples.</p> <p>Transferable skills: Introduction to the methodology of using physical theories in observing phenomena in nature: building a theoretical model, definition of physical quantities and the variables that appear in the model, and comparison with measured quantities.</p>

Metode poučevanja in učenja:

<p>Predavanja, vaje, domače naloge, konzultacije</p>
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Learning and teaching methods:

<p>Lectures, exercises, homework, consultations</p>

Delež (v %) /

Načini ocenjevanja:

Weight (in %)

Assessment:

<p>Način (pisni izpit, ustno izpraševanje, naloge, projekt): 2 kolokvija namesto izpita iz vaj, izpit iz vaj, izpit iz teorije ocene: 1-5 (negativno), 6-10 (pozitivno) (po Statutu UL)</p>	<p>50% 50%</p>	<p>Type (examination, oral, coursework, project): 2 midterm exams instead of written exam, written exam oral exam grading: 1-5 (fail), 6-10 (pass) (according to the Statute of UL)</p>
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Reference nosilca / Lecturer's references:

<p>Anton Ramšak: – PRELOVŠEK, Peter, RAMŠAK, Anton, SEGA, Igor. c-axis conductivity in the normal state of cuprate superconductors. Physical review letters, ISSN 0031-9007. [Print ed.], 1998, 81, str. 3745-3748</p>
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– RAMŠAK, Anton, REJEC, Tomaž, JEFFERSON, J. H. Effect of deconfinement on resonant transport in quantum wires. Physical review. B, Condensed matter and materials physics, ISSN 1098-0121, 1998, 58, str. 4014-4018 [COBISS.SI-ID 778084]

– RAMŠAK, Anton, HORSCH, Peter. Spin polarons in the t-J model : shape and backflow. Physical review. B, Condensed matter, ISSN 0163-1829, 1993, vol. 48, str. 10559-10562 [COBISS.SI-ID 8194855]