

**UČNI NAČRT PREDMETA / COURSE SYLLABUS**

**Predmet:** Repetitorij iz fizike  
**Course title:** Repetitory of Physic

Študijski program in stopnja Study programme and level	Študijska smer Study field	Letnik Academic year	Semester Semester
Tehnologije in sistemi – prva stopnja	/	prvi	prvi
Technologies and Systems – 1st cycle	/	first	first

**Vrsta predmeta / Course type** obvezni/obligatory

**Univerzitetna koda predmeta / University course code:** TS 1 UN 5

Predavanja Lectures	Seminar Seminar	Vaje Tutorial	Klinične vaje work	Druge oblike študija	Samost. delo Individ. work	ECTS
30		30			80	5

**Nosilec predmeta / Lecturer:** izr. prof. dr. Franci Merzel

**Jeziki / Languages:** slovenski/slovenian  
**Predavanja / Lectures:** slovenski/Slovenian  
**Vaje / Tutorial:** slovenski/Slovenian

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

- vpis v prvi letnik študija,
- študent mora pred izpitom pravočasno oddati portfolio z opravljenimi vajami in biti ustrezno prisoten na vajah in predavanjih.

**Prerequisites:**

- enrollment in the first year of study,
- before the exam, the student must submit a portfolio with completed exercises and be properly present at tutorials and lectures.

**Vsebina:**

- Opis gibanja;
- dinamika;
- ravnovesje in elastičnost;
- tekočine;
- nihanje;
- valovanje;
- temperatura;
- toplota;
- prvi in drugi zakon termodinamike;
- elektrostatika, električno polje in električni potencial;
- električni tok in upor;
- magnetno polje in indukcija;
- elektromagnetno nihanje in izmenični tok;
- elektromagnetni valovi;
- optika;
- interferenca in uklon;
- svetloba, fotoni in elektroni;
- atomi;
- trdna snov;
- atomsko jedro;
- energija iz atomskih jeder.

**Content (Syllabus outline):**

- Description of the movement;
- dynamics;
- balance and elasticity;
- fluids;
- fluctuation;
- wave;
- temperature;
- heat;
- the first and second laws of thermodynamics;
- electrostatics, electric field and electric potential;
- electric current and resistance;
- magnetic field and induction;
- electromagnetic oscillation and alternating current;
- electromagnetic waves;
- optics;
- interference and deflection;
- light, photons and electrons;
- atoms;
- solid matter;
- atomic nucleus;
- energy of atomic nuclei.

**Temeljni literatura in viri / Readings:****Temeljna literatura/Basic literature**

Borštnik, Branko. (2011). Fizika za študente visokih šol. Ljubljana: DMFA – založništvo.

**Priporočljiva literatura/Recommended**

Halliday, D., Resnick, R., Walker, J. (2014) *Fundamentals of Physics, 10th edition*. Wiley

**Cilji in kompetence:**

*Učna enota prispeva predvsem k razvoju naslednjih splošnih in specifičnih kompetenc:*

- poznavanje osnovnih pojmov fizike in njihove uporabe,
- sposobnost fizikalnega razumevanja tehniških problemov in uporaba matematičnih metod pri reševanju le-teh – sposobnost prenosa in uporabe pridobljenega teoretičnega znanja v prakso,

**Objectives and competences:**

*The learning unit mainly contributes to the development of the following general and specific competences:*

- knowledge of the basic concepts of physics and their application,
- the ability to physically understand technical problems and use mathematical methods in solving them - the ability to transfer and use the acquired theoretical knowledge in practice,

- sposobnost razumevanja in uporabe sodobnih teorij s področja fizikalnih, tehniških, tehnoloških in naravoslovnih ved,
- sposobnost evidentiranja problema, analize ter predvidevanja rešitev,
- avtonomnost v strokovnem delu s področja tehnologij in sistemov,
- sposobnost interdisciplinarnega povezovanja znanja,
- sposobnost stalne uporabe informacijske in komunikacijske tehnologije na svojem strokovnem področju,
- usposobljenost za svetovalno delo (prenos znanja).

- the ability to understand and apply modern theories in the field of physical, technical, technological and natural sciences,
- the ability to identify a problem, analyze and anticipate solutions,
- autonomy in professional work in the field of technologies and systems,
- the ability to integrate knowledge in an interdisciplinary manner,
- the ability to continuously use information and communication technology in one's professional field,
- qualification for consulting work (transfer of knowledge).

#### **Predvideni študijski rezultati:**

Znanje in razumevanje:

*Študent/študentka:*

- razume osnovne naravne zakonitosti,
- zna podati in razviti matematično analitičen opis osnovnih fizikalnih pojavov,
- osvoji standardne metodološke prijeme reševanja fizikalnih problemov,
- pridobi splošno razgledanost po naravoslovno- tehniških vsebinah,
- razume umeščenost svojega strokovnega področja v matematično-naravoslovnih vedah,
- reflektira vsebine z drugih strokovnih disciplin in jih poveže s pridobljenim znanjem.

#### **Intended learning outcomes:**

Knowledge and understanding:

*Student:*

- understands the basic laws of nature,
- can give and develop a mathematical-analytical description of basic physical phenomena,
- masters the common methodological approaches to solving physical problems,
- acquires a general knowledge of scientific and technical content,
- understands the location of his subject in the mathematical-scientific disciplines,
- reflects contents from other disciplines and links them to the acquired knowledge.

#### **Metode poučevanja in učenja:**

- *predavanja* z aktivno udeležbo študentov (razlaga, diskusija, vprašanja, primeri, reševanje problemov),
- *vaje*, kjer bodo študentje na konkretnih problemih ponovili, utrdili in dodatno osvetlili pojme in metode, spoznane na predavanjih,
- *raziskovalni seminarji*,
- *individualni študij ob uporabi CD-roma*.

#### **Learning and teaching methods:**

- *lectures with* active student participation (explanation, discussion, questions, examples, problem solving),
- *tutorials*, where students will repeat, consolidate and additionally shed light on concepts and methods learned in lectures on specific problems,
- *research seminars*,
- *individual study using CD-ROM*.

Delež (v %) /

**Načini ocenjevanja:**

Weight (in %) **Assessment:**

<ul style="list-style-type: none"><li>• pisni izpit</li><li>• ustni izpit</li><li>• sprotno delo</li></ul> Ocenjevalna lestvica: ECTS.	70% ocene 20% ocene 10% ocene	<ul style="list-style-type: none"><li>• written exam</li><li>• verbal exam</li><li>• ongoing work</li></ul> Grading scale: ECTS.
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