



UČNI NAČRT PREDMETA / SUBJECT SPECIFICATION

Predmet:	Svetloba, vid, barve
Subject Title:	Light, vision, colour

Študijski program Study programme	Študijska smer Study field	Letnik Year	Semester Semester
FIZIKA PHYSICS	-	1 ali 2	1 ali 2

Univerzitetna koda predmeta / University subject code:

Predavanja Lectures	Seminar Seminar	Sem. vaje Tutorial	Lab. vaje Labor work	Teren. vaje Field work	Samost. delo Individ. work	ECTS
10	5		10		125	5

Nosilec predmeta / Lecturer:

Jeziki / Languages:	Predavanja / Lecture:	slovenski/Slovenian in/and angleški s slovenskim prevodom/English with translation in Slovenian
	Vaje / Tutorial:	slovenski/Slovenian in/and angleški s slovenskim prevodom/English with translation in Slovenian

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

Prerequisites:

Vsebina:

1. Geometrijska in valovna optika
2. Oko: nastanek slike, občutljivost in odzivnost
3. Barva: barvni sistemi, fizikalni opis barvnega stimula
4. Modeli barvnega vida
5. Optične lastnosti materialov: barva zaradi odboja, loma, disperzije, barva atomov, ionov, molekul, luminescence, barva pri kovinah, polprevodnikih, izolatorjih

Content (Syllabus outline):

1. Geometrical and wave optics
2. Eye: Imaging in the eye, sensitivity and response
3. Colour: colour order systems, the physics of colour stimuli
4. Models of colour vision
5. Optical properties of materials: colour due to refraction, reflection, dispersion, scattering, colour from atoms, ions and molecules, colour from charge transfer and luminescence, colour in metals, semiconductors and insulators

Temeljni literatura in viri / Textbook:

1. A. Valberg, *Light Vision Color* (John Wiley and Sons, Chichester, 2005).
2. R. Tilley, *Colour and the optical properties of materials* (John Wiley and Sons, Chichester, 2005).
3. D. Falk, D. Brill, and D. Stork, *Seeing the Light, Optics in Nature, Photography, Color, Vision and Holography* (John Wiley & Sons, New York, 1986).
4. D Božič in sod., *Interdisciplinarnost barve* (Društvo koloristov Slovenije, Maribor, 2001, 2003).

Cilji:

Objectives:

Predmet je namenjen učiteljem ter raziskovalcem na področju poučevanja fizike in naravoslovja.

Cilj predmeta je povezati temeljna fizikalna znanja in jih nadgraditi v razumevanje kompleksnosti barvnega vida ter razumevanje fizikalnih pojavov, zaradi katerih predmete vidimo v barvah.

The course is primarily addressed to teachers and researchers in the physics and science education.

The main goal is to connect the basic physics principles in order to understand the complexity of colour vision and relationship between light and the optical properties of materials.

Predvideni študijski rezultati:

Znanje in razumevanje:

Razumevanje kompleksnosti človeškega vida ter zveze med svetlobo, optičnimi lastnostmi materialov in barve.

Prenesljive/ključne spretnosti in drugi atributi:

- Integrirana uporaba fizikalnih znanj
- Prenos znanja v poučevanje fizike in drugih naravoslovnih predmetov.

Intended learning outcomes:

Knowledge and Understanding:

Understanding of the complexity of human colour vision and the relationship between light and the optical properties of materials.

Transferable/Key Skills and other attributes:

- integrated use of physical principles
- transfer of knowledge into the physics and natural science education

Metode poučevanja in učenja:

Predavanja
Seminarji
Laboratorijske vaje

Learning and teaching methods:

Lectures
Seminars
Laboratory work

Delež (v %) /

Weight (in %)

Načini ocenjevanja:

Assessment:

Projektna naloga

75

Project work

Predstavitev projektne naloge

25

Presentation of the project