

UČNI NAČRT PREDMETA / COURSE SYLLABUS

Predmet: Uvod v prostorsko geometrijo
Course title: Introduction to Spatial Geometry

Študijski program in stopnja Study programme and level	Študijska smer Study field	Letnik Academic year	Semester Semester
Računalništvo in spletne tehnologije, visokošolski strokovni študijski program prve stopnje	-	Drugi	Četrty ali šesti
Computer Science and Web Technologies, first cycle Professional Study Programme	-	Second	Fourth or sixth

Vrsta predmeta / Course type

Izbirni / Elective

Univerzitetna koda predmeta / University course code:

2-RST-VS-IP-UPG-2022-12-16

Predavanja Lectures	Seminar Seminar	Vaje Tutorial	Klinične vaje work	Druge oblike študija	Samost. delo Individ. work	ECTS
30	-	45	-	-	105	6

Nosilec predmeta / Lecturer:**Jeziki / Languages:****Predavanja / Lectures:** Slovenski / Slovenian, Angleški / English**Vaje / Tutorial:** Slovenski / Slovenian, Angleški / English**Pogoji za vključitev v delo oz. za opravljanje študijskih obveznosti:**

Pogoj za vključitev v delo je vpis v 2. letnik študija in opravljene obveznosti pri predmetih Matematika 1 in Matematika 2. Študent/študentka mora pred pristopom k izpitu opraviti vse obveznosti na vajah.

Prerequisites:

Enrolment into the second year of the study and passed courses Mathematics 1 and Mathematics 2.
 Before examination, a student must complete all assignments given at the exercises.

Vsebina:**Content (Syllabus outline):**

- Vektorski prostori.
- Baze vektorskih prostorov.
- Linearna algebra (linearne transformacije, kvadratne forme).
- Točke v prostoru, koordinatni sistemi.
- Vektorske operacije v koordinatnih sistemih.
- Matematični zapis krivulj, ploskev, teles in zlepkov, v ravnini in prostoru.
- Krivulje in ploske drugega reda.
- Osnove topologije.
- Osnove projektivne geometrije.

- Vector spaces.
- Bases of vector spaces.
- Linear algebra (linear transformation, quadratic forms).
- Points in the space, coordinate systems.
- Vector operations in coordinate systems.
- Mathematical expressions of curves and surfaces in plane and space.
- Basics of topology.
- Basics of projective geometry.

Temeljni literatura in viri / Readings:

- Audin, M. (2003). Geometry. Springer.
- Stillwell, J. (2005). The Four Pillars of Geometry, Springer.
- Vidav, I. (1991). Višja matematika I. DMFA.
- Vidav, I. (2017). Algebra. DMFA.

Cilji in kompetence:

Učna enota prispeva k razvoju naslednjih splošnih in predmetno-specifičnih kompetenc:

Splošne kompetence:

- poznavanje pomena kakovosti in prizadevanje za kakovost strokovnega dela skozi avtonomnost, samoiniciativnost, (samo)kritičnost, (samo)refleksivnost in (samo) evalviranje v strokovnem delu
- sposobnost fleksibilne uporabe znanja v praksi
- sposobnost logičnega sklepanja, ocenjevanja velikostnega reda rezultata, natančnosti izražanja, pisanja in razmišljanja

Predmetno-specifične kompetence:

- poznavanje osnov linearne algebra
- poznavanje koordinatnih sistemov
- poznavanje krivulj in ploskev v prostoru in njihovih osnovnih lastnosti
- poznavanje matematičnega modela prostorskih podatkov

Objectives and competences:

The instructional unit contributes to the development of the following general and subject-specific competences:

General competences:

- familiarity with the importance of quality, striving to maintain the quality of professional work through practicing autonomous behaviour, showing initiative, as well as through (self-) criticism, (self-)reflection and (self-) evaluation
- ability to use the acquired knowledge in practice in a flexible manner
- ability to make logical conclusions, to estimate the order of magnitude of the result, to be precise in at expressions, writing and thinking

Subject-specific competences:

- Familiarity with basic linear algebra
- Familiarity with coordinates systems
- Familiarity with curves and surfaces in space and their properties
- familiarity with the mathematical spatial data model

Predvideni študijski rezultati:

Intended learning outcomes:

Znanje in razumevanje:

Študent/študentka:

- spozna matematične temelje za opisovanje prostorskih informacij, ki so nujno potrebni za sposobnost ravnanja s prostorskimi podatki in izdelavo spletnih ter mobilnih rešitev, ki temeljijo na prostorskih podatkih.

Knowledge and understanding:

The student:

- obtains a mathematical basis for modelling the spatial data necessary for managing the spatial data and to develop web and mobile applications that rely on spatial data.

Metode poučevanja in učenja:

- predavanja z aktivno udeležbo študentov (razlaga, diskusija, vprašanja, primeri, reševanje problemov)
- vaje: na vajah bodo reševali manjše primere, s katerimi bodo utrjevali snov s predavanj
- domače naloge in projektna naloga – z njimi bo študent preko samostojnega dela utrdil vse znanje, ki ga je pridobil na predavanjih in vajah
- kolokviji: z njimi bodo študentje stimulirani, da sproti študirajo snov, ki bo obravnavana na predavanjih in vajah

Learning and teaching methods:

- lectures with active student participation (explanation, discussion, questions, examples, problem solving)
- tutorials where students will rehearse, revise and lit up notions, methods encountered at lectures
- homework and project work: with them will students by individual work consolidate knowledge obtained at lectures and tutorials
- mid-term examinations will stimulate students to study the matter dealt with at lectures and tutorials simultaneously

Načini ocenjevanja:	Delež (v %) / Weight (in %)	Assessment:
<p>Način (pisni izpit, ustno izpraševanje, naloge, projekt):</p> <ul style="list-style-type: none"> • ustni izpit • pisni izpit <p>Namesto pisnega izpita lahko študent opravi obveznosti predmeta z domačimi nalogami in sprotnim delom (kolokviji, kvizi).</p> <p>Za pristop k ustnemu izpitu je potrebno s pisnim izpitom ali s sprotnim delom zbrati vsaj 51% možnih točk.</p> <p>Ustnega izpita ni potrebno opravljati, kadar študent s pisnim izpitom vsaj 85% točk.</p>	<p style="text-align: center;">30 70</p>	<p>Type (examination, oral, coursework, project):</p> <ul style="list-style-type: none"> • oral exam • written exam <p>Written exam can be replaced with homeworks and intermediate work (mid-term examinations, quizzes).</p> <p>As a prerequisite for the oral examination student must gain at least 51 % of possible points with intermediate work or with written exam.</p> <p>Students who have gained at least 85 % with written exam are exempted from the oral examination.</p>