Univerza v Mariboru

Fakulteta za naravoslovje in matematiko

UČNI NAČRT PREDMETA / COURSE SYLLABUS	
Predmet:	**Integralske transformacije**
Course title:	**Integral Transforms**

Študijski program in stopnja Study programme and level	Študijska smer Study field	Letnik Academic year	Semester Semester
Matematika, 2. stopnja		**1. ali 2.**	**1. ali 3.**
Mathematics, 2nd cycle		**1. or 2.**	**1. or 3.**

Vrsta predmeta / Course type	izbirni/elective
Univerzitetna koda predmeta / University course code:	

Predavanja Lectures	Seminar Seminar	Sem. vaje Tutorial	Lab. vaje Laboratory work	Teren. vaje Field work	Samost. delo Individ. work	ECTS
45		**30**			**135**	**7**

Nosilec predmeta / Lecturer:	Marko JAKOVAC

Jeziki / Languages:	**Predavanja / Lectures:**	SLOVENSKO/SLOVENE
	Vaje / Tutorial:	SLOVENSKO/SLOVENE

Pogoji za vključitev v delo oz. za opravljanje študijskih obveznosti:	**Prerequisits:**
Poznavanje matematične analize.	Knowledge of mathematical analysis.

Vsebina:	**Content (Syllabus outline):**
Klasične Fouriereve vrste. Hilbertov prostor. Ortonormiran sistem. Fouriereva in Laplaceova transformacija. Osnovne lastnosti. Inverzna formula. Uporaba Fouriereve in Laplaceove transformacije. Primeri drugih integralskih transformacij:	Classical Fourier series. Hilbert space. Orthonormal system. Fourier and Laplace transform. Basic properties. Inversion formula. Applications of Fourier and Laplace transform. Examples of other integral transforms: Two sided Laplace transform. Hartley transform,

Dvostranska Laplaceova transformacija. Hartleyjeva transformacija. Mellinova transformacija. Weierstrassova transformacija. Abelova transformacija. Hilbertova transformacija.	Mellin transform. Weierstrass transform. Abel transform. Hilbert transform.

Temeljni literatura in viri / Readings:

E. Zakrajšek: Analiza III, DMFA Slovenije, Ljubljana, 1998
E. Zakrajšek: Analiza IV, DMFA Slovenije, Ljubljana, 1999
A. Suhadolc: Integralske transformacije, Integralske enačbe, DMFA Ljubljana, 1994.
A. Suhadolc: Metrični prostor, Hilbertov prostor, Fouriereva analiza, Laplaceova transformacija, DMFA-založništvo, Ljubljana, 1998.
B. Zmazek: Diferencialna analiza, skripta, Maribor, 2006.
Gabrijel Tomšič, Tomaž Slivnik: Matematika IV, Založba FE in FRI, Ljubljana, 1998.

Cilji in kompetence:	**Objectives and competences:**
Temeljito spoznati integralske transformacije. Poznati uporabo Fouriereve in Laplaceove transformacije.	To know thoroughly integral transforms. To know thoroughly about applications of Fourier and Laplace transform.

Predvideni študijski rezultati:	**Intended learning outcomes:**
Znanje in razumevanje: - Razumevanje in uporaba integralskih transformacij. Prenesljive/ključne spretnosti in drugi atributi: - Identifikacija, formulacija in reševanje matematičnih in nematematičnih problemov s pomočjo integralskih transformacij. - Prenos znanja v zvezi z integralskimi transformacijami na druga področja (strojništvo, astronomija, fizika in druge)	Knowledge and Understanding: - Be able to understand and implement integral transforms. Transferable/Key Skills and other attributes: - Identification, formulation and solving mathematical and non-mathematical problems with integral transforms. - Knowledge transfer of the concepts, connected with integral transforms into other fields (mechanical engineering, astronomy, physics and others).

Metode poučevanja in učenja:	**Learning and teaching methods:**
Predavanja Seminarske vaje Individualno delo	Lectures Tutorial Individual work

Načini ocenjevanja:		**Assessment:**
Izpit:	Delež (v %) / Weight (in %)	Exams:

Pisni izpit – problemi Ustni izpit – teorija Vsaka izmed naštetih obveznosti mora biti opravljena s pozitivno oceno. Opravljen pisni izpit – problemi je pogoj za pristop k ustnemu izpitu – teorija. Pisni izpit – problemi se lahko nadomesti z dvema delnima testoma (sprotne obveznosti).	50% 50%	Written exam – problems Oral exam – theory Each of the mentioned assessments must be assessed with a passing grade. Passing grade of written exam – problems is required to take the oral exam – theory. Written exam – problems can be replaced with two mid-term tests.

Reference nosilca / Lecturer's references:

1. JAKOVAC, Marko. Relating the annihilation number and the 2-domination number of block graphs. *Discrete applied mathematics*, ISSN 0166-218X, 2019, vol. 260, str. 178-187, doi: 10.1016/j.dam.2019.01.020.

2. BUJTÁS, Csilla, JAKOVAC, Marko. Relating the total domination number and the annihilation number of cactus graphs and block graphs. *Ars mathematica contemporanea*, ISSN 1855-3966, 2019, vol. 16, no. 1, str. 183-202, doi: 10.26493/1855-3974.1378.11d.

3. JAKOVAC, Marko, PETERIN, Iztok. The b-chromatic number : a survey. *Discrete applied mathematics*, ISSN 0166-218X, 2018, vol. 235, str. 184-201. http://dx.doi.org/10.1016/j.dam.2017.08.008, doi: 10.1016/j.dam.2017.08.008.

4. GOLOGRANC, Tanja, JAKOVAC, Marko, PETERIN, Iztok. The security number of lexicographic products. *Quaestiones mathematicae*, ISSN 1607-3606, 2018, vol. 41, iss. 5, str. 601-613. https://doi.org/10.2989/16073606.2017.1393705, doi: 10.2989/16073606.2017.1393705.

5. YERO, Ismael G., JAKOVAC, Marko, KUZIAK, Dorota. The security number of strong grid-like graphs. *Theoretical computer science*, ISSN 0304-3975, 2016, vol. 653, str. 1-14, doi: 10.1016/j.tcs.2016.09.013.http://dx.doi.org/10.1007/s00373-010-0898-9.