Univerza v Mariboru
Fakulteta za naravoslovje
in matematiko

UČNI NAČRT PREDMETA / COURSE SYLLABUS	
Predmet:	Izbrana poglavja iz funkcionalne analize
Course title:	Topics in functional analysis

Študijski program in stopnja Study programme and level	Študijska smer Study field	Letnik Academic year	Semester Semester
Matematika, 3. stopnja		**1. ali 2.**	**1. ali 3 ali4.**
Mathematics, 3rd Degree		**1st or 2nd**	**1st or 3rd or 4th**

Vrsta predmeta / Course type   izbirni/elective

Univerzitetna koda predmeta / University course code:

Predavanja Lectures	Seminar Seminar	Vaje Tutorial	Klinične vaje work	Druge oblike študija	Samost. delo Individ. work	ECTS
30					**150**	**6**

Nosilec predmeta / Lecturer: Matej Brešar

Jeziki / **Languages:**	**Predavanja /** **Lectures:**	Slovenski in angleški jezik; Slovene and English
	Vaje / Tutorial:	Slovenski in angleški jezik; Slovene and English

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

Poznavanje temeljnih konceptov funkcionalne analize.

Prerequisits:

Knowledge of basic concepts of functional analysis.

Vsebina:

Izbrana so posebna poglavja iz teorije linearnih topoloških prostorov, teorije operatorjev, topoloških algeber ali katerega drugega modernega področja funkcionalne analize. Izbira poglavij je odvisna od interesa in raziskovalne usmerjenosti študentov ter trendov v sodobni funkcionalni analizi. Spodaj navedena literatura praviloma služi le kot osnova in je nadgrajena z bolj specializiranimi teksti.

Content (Syllabus outline):

Special topics in linear topological spaces, operator theory, topological algebras or some other area of contemporary functional analysis are chosen. The choice depends on students' interests and their research orientation, as well as on trends in modern functional analysis. The literature below in principle serves only as a basis, and is combined with more specialized texts.

Temeljni literatura in viri / Readings:

- J. B. Conway, A course in operator theory, AMS, 2000.
- J. B. Conway, A course in functional analysis, Springer-Verlag, 1997.
- H. G. Dales, Banach algebras and automatic continuity, Oxford Science Publications, 2000.
- N. Dunford, J. T. Schwartz, Linear opeartors, I, II, III, John Wiley & Sons, 1988.
- R. V. Kadison, J. R. Ringrose, Fundamentals of the theory of operator algebras, I, II, AMS, 1997.
- P. D. Lax, Functional analysis, John Wiley & Sons, 2002.
- R. E. Megginson, An introduction to Banach space theory, Springer-Verlag, 1998.
- H. H. Schaefer, M. P. Wolff, Topological vector spaces, Springer-Verlag, 1999.

Cilji in kompetence:

- študentu predstaviti moderno področje funkcionalne analize, kar lahko služi kot uvod v raziskovalno delo;
- Doseči poglobljeno razumevanje teoretskih in metodoloških konceptov s področja funkcionalne analize
- Razviti sposobnost za samostojno reševanje najzahtevnejših problemov iz funkcionalne analize
- Zmožnost razvijanja kritične refleksije na področju funkcionalne analize

Objectives and competences:

- to present a modern area of functional analysis, which can serve as an introduction to student's research work;
- To achieve a deeper understanding of theoretical and methodological concepts of functional analysis
- To develop the ability for solving the most challenging problems in functional analysis
- Ability to develop critical reflection in functional analysis

Predvideni študijski rezultati:

Znanje in razumevanje:
- poglobljeno znanje posebnega področja funkcionalne analize;
- poglobljeno razumevanje nekaterih posebnih pojmov funkcionalne analize.

Prenesljive/ključne spretnosti in drugi atributi:
- podlaga za raziskovalno delo na posebnem področju funkcionalne analize

Intended learning outcomes:

Knowledge and understanding:
- a deeper knowledge of basic of a special functional analysis topic;
- a deeper understanding of some special functional analysis concepts.

Transferable/Key Skills and other attributes:
- a basis for research in a special functional analysis area.

Metode poučevanja in učenja:	**Learning and teaching methods:**
• predavanja; • priprava seminarja; • konzultacije; • samostojni študij.	• lectures; • seminar work; • consultations; • self-study.

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

Način (pisni izpit, ustno izpraševanje, naloge, projekt);	Weight (in %)	Type (examination, oral, coursework, project):
• seminarsko predavanje;	**20 %**	• seminar talk;
• domače naloge;	**30 %**	• homework;
• ustni izpit.	**50 %**	• oral examination

Reference nosilca / Lecturer's references:

1. BREŠAR, Matej. Functional identities and rings of quotients. *Algebras and representation theory*, ISSN 1386-923X, 2016, vol. 19, iss. 6, str. 1437-1450

2. BREŠAR, Matej. Finite dimensional zero product determined algebras are generated by idempotents. *Expositiones mathematicae*, ISSN 0723-0869, 2016, vol. 34, iss. 1, str. 130-143.

3. BREŠAR, Matej. Functional identities on tensor products of algebras. *Journal of algebra*, ISSN 0021-8693, 2016, vol. 455, str. 108-136

4. BREŠAR, Matej. Jordan {g, h}-derivations on tensor products of algebras. *Linear and Multilinear Algebra*, ISSN 0308-1087, 2016, vol. 64, no. 11, str. 2199-2207.

5. ALAMINOS, J., BREŠAR, Matej, ŠPENKO, Špela, VILLENA, A. R. Orthogonally additive polynomials and orthosymmetric maps in Banach algebras with properties A and B. *Proceedings of the Edinburgh Mathematical Society*, ISSN 0013-0915, 2016, vol. 59, iss. 3, str. 559-568.