Study programme(s): Mathematics (MA), Applied Mathematics (MB)	
Level: master	
Course title: Fixed Point Theory (MA-14)	
Lecturer: Olga L. Hadžić	
Status: elective	
ECTS: 5	
Requirements: none	

Learning objectives

Introducing students to a very important discipline of mathematical analysis, interesting both from the theoretical point of view and for its various applications in other sciences, especially in economical modelling.

Learning outcomes

Successful students should understand the basic principles and techniques of the fixed point theory, and be able to apply these principles in modelling concrete problems from other scientific areas.

Syllabus

Theoretical instruction

The Banach contraction principle, its generalizations and applications. Fundamentals of the simplex theory. Brouwer's theorem of fixed point and applications. Fundamentals of the KKM theory. Schauder's, Tychonoff's and Rothe's fixed point theorem. Continuous extension by a parameter. Krasnoselskii's fixed point theorem. Measure of noncompactness. Condensing operators. Generalizations of Schauder's theorem. Nonexpansive mappings. Fixed point theorem in metric spaces with a convex structure.

Practical instruction

Problem sessions follow the material covered at theoretical lectures. Problem solving exercises.

Literature

   1. O.Hadžić, *Osnovi teorije nepokretne tačke*, Institut za matematiku, Novi Sad, 1978.

Weekly teaching load				Other: 0
Lectures: 2	Exercises: 2	Other forms of teaching: 0	Student research: 0	
Teaching methodology				
Theoretical plenary lectures and problem solving on the blackboard.				
Grading (maximum number of points 100)				
Pre-exam obligations	points	**Final exam**		points
Colloquia	50	Oral exam		50