Level: bachelor

Course title: Fixed Point Theory (M4-29)

Status: elective

ECTS: 5

Requirements: none

Learning objectives

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

Learning outcomes

Successful students will understand the basic principles and techniques of fixed point theory, and will 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. Fundaments of simplex theory. Brouwer's theorem of fixed point and applications.

Fundaments of 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 on theoretical lectures. Solving exercises.

Weekly teaching load				Other: 0
Lectures: 2	Exercises: 2	Other forms of teaching: 0	Student research: 0	