Course description

Department/Unit /	KMA / TVN			**Academic Year**	2023/2024
Title	Theory of Variational Inequalities			**Type of completion**	Exam
Accredited/Credits	Yes, 5 Cred.			**Type of completion**	Written
Number of hours	Lecture 4 [Hours/Week]				
Occ/max	Status A	Status B	Status C	**Course credit prior to**	YES
Summer semester	0 / -	0 / -	0 / -	**Counted into average**	YES
Winter semester	0 / -	0 / -	0 / -	**Min. (B+C) students**	1
Timetable	Yes			**Repeated registration**	NO
Language of instruction	Czech			**Semester taught**	Summer semester
Optional course	Yes			**Internship duration**	0
Evaluation scale	1|2|3|4			**Ev. sc. – cred.**	S|N
No. of hours of on-premise					
Auto acc. of credit	No				
Periodicity	K				
Substituted course	None				
Preclusive courses	N/A				
Prerequisite courses	N/A				
Informally recommended courses	N/A				
Courses depending on this Course	N/A				

Course objectives:

The goal of this course is to give a grouding in the theory of variational inequalities and applications to unilateral boundary value problems for differential equations.

Requirements on student

The ability to apply theoretical results in solving problems on the topics in the syllabus.

Content

The weak formulation of unilateral boundary value problems in terms of variational inequalities, variational method, penalty method, method of successive approximations, problems with a free boundary and their variational formulations.

Fields of study

Guarantors and lecturers

- **Guarantors:** Prof. RNDr. Pavel Drábek, DrSc. (100%)

Literature

- **Recommended:** Fučík, Svatopluk; Kufner, Alois. *Nelineární diferenciální rovnice*. Vyd. 1. Praha : Nakladatelství technické literatury, 1978.
- **Recommended:** J. F. Rodrigues. *Obstacle Problems in Mathematical Physics*. 1991.

Time requirements

All forms of study

Activities	Time requirements for activity [h]
Contact hours	52
Preparation for an examination (30-60)	52
Individual project (40)	26
Total:	**130**

assessment methods

Knowledge - knowledge achieved by taking this course are verified by the following means:

Combined exam

Seminar work

prerequisite

Knowledge - students are expected to possess the following knowledge before the course commences to finish it successfully:

Students should be familiar with the theory of ordinary differential equations (to the extent of the course KMA/ ODR) and elements of partial differential equations.

teaching methods

Knowledge - the following training methods are used to achieve the required knowledge:

Lecture supplemented with a discussion

Interactive lecture

Self-study of literature

Individual study

One-to-One tutorial

learning outcomes

Knowledge - knowledge resulting from the course:

Students after finishing this course will have a survey about basic approaches to solution of variational inequalities and their relation to boundary value problems for differential equations.

Course is included in study programmes: