Study program: Mathematics (Ph.D. program)	
Course: Finite Element Methods for Partial Differential Equations	
Course instructor(s): Helena Zarin	
Course type (compulsory/elective): elective	
Credit points: 10 ECTS	
Prerequisites: -	

Course objectives:
  Introduction to finite element methods for partial differential equations.

Learning outcomes:
  Adoption of numerical methods which enable research in the field of partial differential equations.

Course description (outline):
Weak solutions. Lax-Milgramm lemma. Cea theorem. Finite element spaces. Polynomial approximations in Sobolev spaces. Nonconforming methods. Isoparametric elements. A posteriori error estimates. Saddle point problem. Stokes problem. Finite elements in mechanics.

References:
  1. Ciarlet, P.G., Handbook of Numerical Analysis, Finite Element Methods, Elsevier, 1991
  2. Braess, D. Finite Elements, Cambridge University Press, 2001
  3. Brenner, S.C., Scott, L.R., The Mathematical Theory of Finite Element Methods, Springer, 2002

Active teaching hours	**Theoretical classes:** 2	**Practice classes:** -6

Methods of teaching:
  Lectures and computer practice, with active participation of the students, discussion, etc.

Grading structure			
Pre-exam obligations	**Points**	**Exam**	**Points**
Colloquia	**25**	Oral exam	**50**
Seminars	**25**		