

Study programmes: PhD studies – Mathematics, Applied Mathematics				
Course name: 3M509 - Finite Element Method and Applications				
Lecturers: Aleksandar Savić, Aleksandra Delić, Sandra Živanović				
Status: Optional				
ECTS: 9				
Attendance prerequisites: No prerequisites				
Course aims: Introduction to the finite element method and training for creative work.				
Course outcome: After completing this course, the student has fundamental knowledge about the finite element method. He is able to independently solve real problems using appropriate software.				
Course content: Variational formulation of boundary value problems. The Ritz-Galerkin method, the collocation method and the least square method. Finite elements in one, two and three dimensions. Higher order finite elements. A fine family of finite elements. A Conformal Decomposition Finite Element Method. Hierarchical finite elements. Isoparametric elements. Finite element spaces. Error analysis in different norms. The effect of numerical integration in finite element methods. Computer algorithms and software packages.				
Literature: <ol style="list-style-type: none"> 1. <i>Morton K.W., Basic Course in Finite Element Methods, Oxford University Computing Laboratory, 1986.</i> 2. <i>Strang G., Fix G., An Analysis of the Finite Element Method, Prentice-Hall, 1973.</i> 3. <i>Ciarlet, P.G., The Finite Element Method for Elliptic Problems, SIAM Classics in Applied Mathematics, No. 40, SIAM, Philadelphia, 2002.</i> 				
Number of hours: 10	Lectures: 4	Tutorials: -	Laboratory: -	Research: 6
Teaching and learning methods: Frontal / Interactive / Exercises				
Assessment (maximal 100 points)				
Course assignments	points	Final exam		points
Lectures	-	Written exam		-
Exercises / Tutorials	-	Oral exam		70
Colloquia	-	Written-oral exam		-
Essay / Project	30			