Faculty of Science and Mathematics / MATHEMATICS / EQUATIONS OF MATHEMATICAL PHYSICS

Course:	EQUATIONS OF MATHEMATICAL PHYSICS			
Course ID	**Course status**	**Semester**	**ECTS credits**	**Lessons** (Lessons+Exercises+Laboratory)
6912	Mandatory	1	5	3+1+0
Programs	MATHEMATICS			
Prerequisites	No			
Aims	After the course, students will have knowledge of modelling of social and natural phenomeona through partial differential equations			
Learning outcomes	After passing this exam, students: Apply basic principles of modelling of natural and social phenomena partial differential equations. Customize odds partial differential equations according to the considered situation. Prove the existence and uniqueness of solutions of known nonlinear partial differential equations. Identifies type of partial differential equations and finds its numerical solution. An interpretation of solutions of equations as a description of the natural or social phenomenon that is modelled.			
Lecturer / Teaching assistant	Darko Mitrović			
Methodology	Attending lectures, doing homework, and attending consultations			
Plan and program of work				
Preparing week	Preparation and registration of the semester			
I week lectures	Introductory notions.			
I week exercises	Solving of basic PDEs			
II week lectures	Classification of partial differential equations of second order			
II week exercises	Classification of partial differential equations of second order			
III week lectures	Parabolic equations. Heat conduction. Diffusion. Cauchy problem.			
III week exercises	Heat conduction. Diffusion. Cauchy problem.			
IV week lectures	Solution of Cauchy problem by Fourier transform methods. Boundary problem of Sturm-Liouville.			
IV week exercises	Solution of Cauchy problem by Fourier transform methods.			
V week lectures	Maximum principle. Non-homogeneous heat equation. Examples.			
V week exercises	Preparation for I colloquium			
VI week lectures	I colloquium			
VI week exercises	Preparation for the correction of I colloquium			
VII week lectures	Correction of I colloquium			
VII week exercises	Defence of homework			
VIII week lectures	Hyperbolic equations. Wire equation. Cauchy problem. Method of characteristics			
VIII week exercises	Cauchy problem. Method of characteristics			
IX week lectures	Energy inequality. Kirchoff formulas.			
IX week exercises	Energy inequality. Kirchoff formulas.			
X week lectures	Wave propagation.			
X week exercises	Wave propagation.			
XI week lectures	Elliptic equations. Electrodynamics. Laplace and Poisson equations.			
XI week exercises	Laplace and Poisson equations.			
XII week lectures	Dirichlet and Neumann problems. Green function.			
XII week exercises	Dirichlet and Neumann problems.			
XIII week lectures	Uniqueness. Non-differentiable and discontinuous solutions to PDEs.			
XIII week exercises	Preparation for II colloquium			

XIV week lectures	II colloquium
XIV week exercises	Preparation for correction of II colloquium
XV week lectures	Correction of II colloquium
XV week exercises	Defence of homework
Student workload	6 hours 40 minutes / week

Per week	**Per semester**
5 credits x 40/30=6 hours and 40 minuts 3 sat(a) theoretical classes 0 sat(a) practical classes 1 excercises **2 hour(s) i 40 minuts** of independent work, including consultations	Classes and final exam: **6 hour(s) i 40 minuts x 16 =106 hour(s) i 40 minuts** Necessary preparation before the beginning of the semester (administration, registration, certification): **6 hour(s) i 40 minuts x 2 =13 hour(s) i 20 minuts** Total workload for the subject: **5 x 30=150 hour(s)** Additional work for exam preparation in the preparing exam period, including taking the remedial exam from 0 to 30 hours (remaining time from the first two items to the total load for the item) **30 hour(s) i 0 minuts** Workload structure: **106 hour(s) i 40 minuts (cources), 13 hour(s) i 20 minuts (preparation), 30 hour(s) i 0 minuts (additional work)**
Student obligations	Attending lectures, doing homework, and attending consultations
Consultations	2 hours/week
Literature	I. Aganović, V. Veselić Parcijalne diferencijalne jednadžbe, Element, Zagreb, 1987. F. John Partial Differential Equations, Springer Verlag, 1982. Skripta predavanja
Examination methods	2 coloquims 30 points each (60 points). 2 dhomeworks 4 point each (8 points). Attending classes: 2 points. Final exam - 30 points. Success level is 50 points.
Special remarks	
Comment	

Grade:	F	E	D	C	B	A
Number of points	less than 50 points	greater than or equal to 50 points and less than 60 points	greater than or equal to 60 points and less than 70 points	greater than or equal to 70 points and less than 80 points	greater than or equal to 80 points and less than 90 points	greater than or equal to 90 points