

## Introduction in Methods of Theoretical Physics

<b>Unit Title</b>	Introduction in Methods of Theoretical Physics.		
<b>Level of Study</b>			
<b>Credit Value</b>		<b>ECTS Value</b>	
<b>Home Department</b>	Department of Theoretical Physics		
<b>Home Faculty</b>	Physics Faculty		
<b>Unit Co-ordinator</b>	Kirill B. Tsiberkin		
<b>Key Words</b>	hyperbolic, parabolic and elliptic second-order linear equations, D'Alembert formula for wave equation, separation of variables and Fourier series, and Green's functions for all the equation kinds. Sturm–Liouville problem, one-, two- and three-dimensional initial-valued problems, bessel functions, orthogonal polynomials, and spherical harmonics.		
<b>Brief Summary</b>	The course introduces hyperbolic, parabolic and elliptic second-order linear equations with its application in physics.		
<b>Indicative Content</b>	The course introduces hyperbolic, parabolic and elliptic second-order linear equations with its application in physics. It describes the solution methods as D'Alembert formula for wave equation, separation of variables and Fourier series, and Green's functions for all the equation kinds. Sturm–Liouville problem, and one-, two- and three-dimensional initial-valued problems with different kinds of uniform and non-uniform boundary conditions are considered. The special functions are studied: Bessel functions, orthogonal polynomials, and spherical harmonics.		