

Level: bachelor				
Course title: Mathematical methods III				
Status: obligatory				
ECTS: 8				
Requirements: Mathematical methods I and Mathematical methods II				
Learning objectives Introduction to the basics of the theory of differential equations and probability theory and its applications.				
Learning outcomes At the end of the course, students should be able to apply learned methods and techniques to the problems that arise in practice, and to understand the basic theory of differential equations and probability.				
Syllabus <ul style="list-style-type: none"> • Differential equations of the first order. Types of integrable differential equations. Implicit differential equations. Singular integral. Models. • Systems of differential equations. Linear systems. Homogeneous and nonhomogeneous systems. Linear systems with constant coefficients. Models. • Linear equations of the n - th order, homogeneous and non-homogeneous, the variation of parameters. Equations with constant coefficients. Equations with nonconstant coefficients, ordinary and regular singular point. Models. • Partial differential equations; some equations of mathematical physics. • Elements of the Probability theory. Probability, random variables, functions of random variables, multivariate random variables, Laws of large numbers, central limit theorem. Introduction to the basics of statistics. <p>Lectures are presented using classical teaching methods and supported by beamer presentations. Exercises are used to practise and analyse typical problems and their solutions. The ability of application of theoretical knowledge is checked on two colloquia. On the final exam, students are expected to demonstrate general understanding of the material presented.</p>				
Weekly teaching load				Other:
Lectures: 4	Exercises: 3	Other forms of teaching:	Student research:	