Partial Differential Equations of Mathematical Physics

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Timetable: 10 hours. First lecture on February 13, 2018, 09:00 (dates already fixed, see the calendar), Torre Archimede, Room 2BC/30

Course requirements: Knowledge of basic university facts on functions of real and complex variables, differential equations, algebra and geometry. Everything is up to the level of understanding basic university courses which include these subjects.

Examination and grading: During the course I will ask some questions for homework activity. Those who will complete these homework questions will get score up to 50% of the total. The final test (quiz) will be given to the students, and on the base of this test a student may have also up to 50% of the total score. Those students who will consider their score lower than they’ve expected will be provided with an opportunity to defend their answers with no restrictions on time after the last lecture.

SSD: MAT/05

Aim: The course discusses the application of mathematics to problems in physics and development of the mathematical methods suitable for such applications and for the formulation of physical theories and effects. It is aimed to provide the students with a theoretical and practical knowledge of the studying and solving problems inspired by physics or thought experiments within a mathematically rigorous framework.

Course contents: The course briefly covers elliptic, parabolic and hyperbolic equations in a various setting. It provides with classical formulae for solutions and physical meaning of these formulas. It also treats the concept of correctness, generalized solutions and regularizations. It covers to some extent notions and useful facts of Fourier analysis, orthogonality and special functions, including Bessel functions, potential theory, harmonic functions and Lyapunov surfaces.