

Partial Differential Equations

Lecturers: Alexey Glutsyuk and Ilya Vyugin

Semester: Spring, 5 credits

The course of partial differential equations is devoted to studying equations which describe basic phenomena of environment such as heat spreading, waves and stationary physical processes. Also we are going to discuss the generalized functions theory which are used for studying of equations of mathematical physics.

Program

1. Physical sense of the basic equations of mathematical physics.
2. Method of Characteristics and reduction of equations to the canonical form.
3. The wave equation. d'Alembert's formula.
4. The Fourier method and the Sturm–Liouville problem.
5. The first boundary-value problem for the heat equation.
7. Boundary-value problems for wave equation and Laplace equation.
8. Cauchy problem for heat equation.
9. Petrovsky correctness and Schredinger equation.
10. The concept of a generalized function
11. Generalized and fundamental solutions.
12. The Kirchhoff and Poisson formulas.