



Mathematics – A Brief Guide for Engineers and Technologists, part 1

Lecturer: prof. Jarosław Rybicki ; 15 h

Course contents:

1. FUNCTIONS OF ONE VARIABLE: limits, continuity, differentiation, differentials, mean value theorems, integration, improper integrals, numerical differentiation and integration.
2. ORDINARY DIFFERENTIAL EQUATIONS: first-order differential equations, first-order linear differential equations, homogeneous and non-homogeneous linear differential equations with constant coefficients, phase plane, critical points in the phase plane, stability of critical points, nonlinear oscillators, examples of applications. Overview of numerical methods for solving ordinary differential equations.
3. INFINITE SERIES: infinite sequences, convergence and divergence of infinite series, criteria of convergence, alternating series, uniform convergence, power series, Taylor series and their applications, asymptotic series, Fourier series, sine and cosine series, convergence of Fourier series, Fourier series and ordinary differential equations.
4. FUNCTIONS OF MANY VARIABLES: limits and continuity, partial derivatives, chain rules for partial derivatives, differentials and exact differential, directional derivative and gradient, Taylor's theorem for functions of several variables, maxima and minima, multiple integrals. The Monte Carlo method for calculating multiple integrals.

TERMINY WYKŁADÓW			
Data	Dzień tygodnia	Godzina	Sala
15.11.2011	Wtorek	17.00-19.00	418, gmach B
22.11.2011	Wtorek	17.00-19.00	418, gmach B
13.12.2011	Wtorek	17.00-19.00	418, gmach B
20.12.2011	Wtorek	17.00-19.00	418, gmach B
03.01.2012	Wtorek	17.00-19.00	418, gmach B
10.01.2012	Wtorek	17.00-19.00	418, gmach B
17.01.2012	Wtorek	17.00-20.00	418, gmach B