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Mathematics for engineers III (Calculus 2)

1 differentiation in $\mathbb{R}^d$
partial derivative, directional derivative, Hesse matrix
Taylor expansion, total differentiability
extrema, extremal values with constraints, Lagrangian formalism
vector fields, Jacobian, chain rule, divergence, curl, Laplacian
curves and parameter description

2 integration in $\mathbb{R}^d$
volume integral, coordinate transformation, center of mass, moment of inertia, parallel axis theorem
line integral, potential, integrability conditions
examples of integrals, surface integral, implicit function theorem

3 Fourier series
projections in L_2, real and complex Fourier series, properties of Fourier coefficients
convergence conditions in L_2, time and frequency domain, Gibbs phenomenon
natural oscillations, Fourier transformation, Parseval's identity