

Mathematics 605

Differential Equations III

Calendar Description: Systems of ordinary differential equations. Existence and uniqueness. Introduction to partial differential equations.

Prerequisites: Applied Mathematics 411 and Mathematics 445 or 447 or consent of Department

Antirequisite: Applied Mathematics 605

Textbooks:

P, Hartman, Ordinary Differential Equations, Wiley W. A. Strauss, Partial Differential Equations, an introduction", second ed, Wiley.

(see Course Descriptions under the year applicable: http://www.ucalgary.ca/pubs/calendar/)

Syllabus

Topics:	<u>Number of</u> <u>Hours</u>
Existence and uniqueness of solutions of ordinary differential equations.	3
Dependence on initial conditions and parameters.	2
Linear systems. Systems with periodic coefficients, Floquet theory, periodic solutions, stability.	8
Nonlinear systems. Poincaré-Bendixson theory, qualitative analysis, stability, linearization.	8
Partial differential equations: first order equations, the Cauchy-Kowalewski theorem. Classification of second order equations: hyperbolic, elliptic and parabolic.	9
Optional topics: boundary value problems, asymptotics, chaos and global analysis of ordinary differential equations, distributions, weak solutions, or the choice of the instructor.	6
TOTAL:	36

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