CPSC 542

Computational Methods for Ordinary Differential Equations and Dynamical Systems

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This course will investigate practical computational techniques for ordinary differential equations. The need to simulate solutions of such equations, and more generally of continuous dynamical systems, arises in many applications. Topics include

- Runge-Kutta and multistep methods for stiff and nonstiff equations;
- adaptive error control and mathematical software;
- methods for boundary value problems;
- methods for constrained problems (DAEs); and
- special methods for dynamical systems.

Prerequisites: some knowledge in differential equations and numerical methods (cpsc 303 is sufficient). Consult me if in doubt.

Work: There will be approximately four assignments and a course project which may be based on your favourite application.

Note: This course will be taught together with cpsc 403; however, graduate students are expected to register for cpsc 542 and their course requirements will be different from those of undergrads.