Asymptotic Methods of Applied Mathematics

MATH 4708/5408 (MAT 5185) - Fall 2022

Instructor: Prof. Lucy Campbell

This course covers asymptotic and perturbation methods for obtaining approximate analytical solutions to problems involving linear and non-linear differential equations. These methods allow one to analyze and obtain insight into complex problems, for example, in physics and engineering, for which closed form solutions often cannot be obtained. Asymptotic solutions can be used to validate the results of numerical simulations.

The course is aimed at graduate students and senior undergraduates in applied math, as well as in engineering and the physical sciences. The prerequisites are undergraduate complex analysis (e.g. MATH 3057) and differential equations, including Fourier and Laplace transform methods (e.g. MATH 3008, MATH 3705).

For more information, see the course webpage:

http://www.math.carleton.ca/~campbell/MATH5408

or contact: Lucy Campbell (campbell@math.carleton.ca)

[An example of an approximate asymptotic solution vs. the corresponding exact solution (Bender and Orszag, 1999)]