Applied Mathematics 433   Mathematical Methods in Physics

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

Syllabus

Topics	Number of Hours
Complex Analysis, Laurent Series, Residues, Cauchy theorem, Evaluation of real integrals by methods of complex analysis	12
Fourier Series and Fourier Integrals, boundary value problems for physical fields	7
Partial Differential Equations	11
Green's Functions	2
Laplace Transforms and applications	4
TOTAL HOURS	**36**

Course Outcomes:

Overview: The course introduces techniques of calculus of variations, complex variables, Fourier methods, and series expansions to solve various mathematical problems of interest in physics.

Calculational skills:

1.   The student will be able to compute integrals using residue theory, Laurent expansions of rational functions,

2.   Fourier series, Fourier integrals and series methods to solve some of the classical partial differential equations of mathematical physics as well as analyze the frequency content of digital signals.

3.   Furthermore, the student will have some understanding of the construction of functionals and the solution of Euler-Lagrange equations.

The mathematical level is pitched slightly below that of Butkov's `Mathematical Physics'.

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