Partial Differential Equations: Models & Phenomena

Many mathematical models are formulated in terms of partial differential equations (PDEs). A complete applied mathematical study addresses two issues: connection of the original context with the model equations (derivation & interpretation), and investigation of the mathematical properties of the equations themselves (analysis & solution). Methods for the derivation, solution and computation of PDE models are discussed within the context of simple examples taken from the physical sciences.

The linear PDE trilogy (diffusion, Laplace & wave equations) will be investigated through the development of various solution techniques: eigenfunction expansions, Greens functions & integral transforms. Advanced lectures will address special examples of nonlinear PDEs.

Professor: David Muraki, 1127 Warren Weaver Hall, 998-3307
Lectures: 7:00-8:50pm — wednesday — 1013 Warren Weaver
Office Hours: by appointment (arrangements by phone/e-mail)
other books on reserve in CIMS library
E-Mail: essential channel for class communications
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Computing: numerical computing is an integral part of modern applied mathematics
computations & graphics will demand use of Matlab software
Matlab is accessible from CIMS UNIX accounts
CIMS UNIX computing/printing on (5th floor) & lab (1st floor)
PC student versions available from NYU bookstore
Responsibilities: written assignments
emphasis on presentation of concepts
balance of mathematical notation & discussion
evaluation: correctness, clarity, conciseness
discussion while working problem sets is encouraged
active participation in class & e-mail discussions
final assignment/project