Math 400

Instructor: Neil Balmforth, njb@math.ubc.ca

Prerequisites: Complex variables (e.g. one of MATH 300, MATH 305) and an introduction to partial differential equations and Fourier series (e.g. one of MATH 256, MATH 257, MATH 316, MATH 368, MECH 368, PHYS 312). Implicit prerequisites: multivariable calculus, vector calculus, and linear algebra.

1. Definitions and classification - Parabolic (heat), elliptic (Laplace) and hyperbolic (wave) equations
2. Review of solution by separation of variables and Fourier series
3. Eigenfunction expansions and Sturm-Liouville theory
4. Solution by integral transforms
5. Quasi-linear first-order equations
6. Shocks and applications to traffic flow

Course website: www.math.ubc.ca/∼njb/Math400.htm

Optional text (none required): *Elementary Partial Differential Equations*, R. Haberman.

Approximate breakdown of marks (to be discussed in class): 50% final, 25% midterm, 25% assignments

Course Policies: Homework assignments submitted late will not be marked without instructor approval. Students are allowed to collaborate with others when working on homework assignments. However, the work that they submit must be their own and not copied. There are no make-up tests for missed midterm tests. If academic concession for a missed midterm test is requested by a student and approved by the course instructor, then the marks for the missed test are shifted onto the final examination. Examples of valid reasons include illness and being absent from home to represent the University, British Columbia or Canada in a competition or performance. Examples of reasons that are not valid include conficts with personal travel schedules or conflicts with work schedules. For more details on academic concession see the UBC Calendar website.

University Policy Statement:

https://senate.ubc.ca/policies-resources-support-student-success