Math 656 Introduction to Partial Differential Equations

Sijue Wu

Mon. Wed.: 2:30pm-4pm, 3333 MH

Office hours: Mon: 4-5pm, Wed: 4-6pm, and by appointment.

Office: 4064 EH, Phone: 734-764-6898, sijue@umich.edu

website: http://www.math.lsa.umich.edu/~sijue/class656.html

Prerequisites: Math 451, 452, Math 556, Math 597

Texts: Fritz John: Partial Differential Equations, Springer

                L. C. Evans: Partial Differential Equations. Graduate Studies in
                        Mathematics, 19. AMS 1998. ISBN: 0-8218-0772-2

Reference: Robert C. McOwen: Partial Differential Equations: methods and applications, 2nd ed. Prentice Hall

Partial Differential Equations are mathematical structures for models
in science and technology. It is of fundamental importance in
physics, biology and engineering design with connections to analysis,
geometry, probability and many other subjects. The goal of
this course is to introduce students (both pure and applied) to the
basic concepts and methods that mathematicians have developed to
understand and analyze the properties of solutions to partial
differential equations.

Topics to be covered will include nonlinear first order equations, linear elliptic,
hyperbolic and parabolic equations. The method of characteristics,
energy methods, maximum principle, Fourier transform and Sobolev spaces will be introduced.

Course material will be partly taken from Chapters 1, 2, 3.6, 4, 5, 7 of F. John, and/or Chapters 1-3, 5 of Evans

Grading: Grades will be based on a few sets of homework and attendance and participation. Homework will be announced in class
and posted on the course website. You are encouraged to discuss with your classmates, however you are required to write up the
answer by yourself. No late homework.

Subsequent Courses: Math 657 Nonlinear Partial Differential Equations