Books useful for M435

Zachmanoglu, Thoe: *Introduction to Partial Differential Equations with Applications*, Dover — Official course textbook; see more on syllabus

Farlow: *Partial Differential Equations for Scientists and Engineers*, Dover — Decent book with modelling and calculational techniques, but virtually no theory. Since this also excludes very simple parts of theory that are perfectly useful for Sci&Engr, relying on the book alone will severely limit your ability to go beyond the calculational stuff, and this is a dead end. Very useful if you master the book. Becomes harmful if you *are* mastered by the book.

Haberman: *Elementary Applied Partial Differential Equations*, Prentice Hall — Popular, loquacious, and expensive. Things that are unified in ideas may be very far apart in the book (like Ch 2 vs Ch 7), so if you use it with the lecture, you may find that I am occasionally in two sections or chapters at the same time. Does contain good stuff, some beyond 435.

Gustafson: *Partial Differential Equations and Hilbert Space Methods*, Dover — Another friendly priced classic. Most agree that it is somewhat too advanced to serve as a 435 textbook, but the 1st chapter is actually quite nice, and the organization along "the usual three…" fits the design of 435 very well. What makes it advanced is the second half of the title. More mathematically oriented audience may want to give some consideration to the book, and up to sec 1.6, it should be more widely palatable.

Guenther, Lee: *Partial Differential Equations of Mathematical Physics and Integral Equations*, Dover – Contents, minus Integral Equations, fits the course reasonably well, but the design 'one space dimension first' seems to tear apart similar themes, so the same comment about the lecture being in two chapters at the same time applies here.

Keane: *A very applied first course in Partial Differential Equations*, Prentice Hall — This seems to be a very nice book, and I have considered it seriously for course adoption, but it is expensive. It would need a little spice added from the lecture, and it has some of the benefits of Farlow without being quite as confining in its viewpoint, and a bit of the usual modern-textbook loquacity. It's a pity we don't seem to have it in the library; but if you'd like to have a look at it, I have a copy to borrow briefly.

O'Neil: *Beginning Partial Differential Equations*, Wiley — A good fit for the theme of the course, more mathematically minded than Farlow, Haberman or Keane. But a somewhat cozier textbook style than Zachmanoglu, Thoe.

Evans: *Partial Differential Equations*, Amer. Math. Society — We often take this as textbook for out 535-536 sequence. Strong math majors aiming beyond 435 may already have a look at it, but it is clearly beyond the 435 course.