

Syllabus for M597J: PDE III (Fall 2004)

Yuxi Zheng, Professor

Lecture Schedule: TR 1:00-2:15PM, 105 Osmond

Contact info: yzheng@math.psu.edu; Phone 865-0361; 007C Thomas Building

Web address: <http://www.math.psu.edu/yzheng>

Office hours: TRF 2:15-3:15pm.

This is PDE III. Together with PDE IV to be offered in the Spring 2005, it is intended as an intermediate PDE course sequence. The sequence is at a higher level than M513-514. And it is not yet specialized to the instructor's own research area(s). It is intended to cover skills and techniques that are needed in a BROAD area of the applied and computational mathematics program and common knowledge to all the PDE'ers of the PSU.

Specific **materials** are: Schauder and De Giorgi-Nash estimates for elliptic equations for Dirichlet, oblique, and mixed type boundary value problems with boundaries that have corners (useful for numerical estimates). A bit of geometrical PDEs (minimal surface equations). PDE IV will cover evolution-type equations.

Prerequisite is M513-4 or equivalent familiarity with PDEs.

1. Text: *Elliptic Partial Differential Equations of Second Order*, by Gilbarg and Trudinger, 2nd Edition (1983, 2001).

2. Homework: Visit <http://www.math.psu.edu/yzheng/m597jindex.html>

Schedule: The assignment will be sporadic, depending on the material covered.

3. Examinations: There will be no exams. Instead, student is required to deliver a 45-minute presentation. The final course grade will be determined as follows: 50% homework + 50% presentation.

4. Reference books: *Second Order Elliptic Equations and Elliptic Systems*, (Translations of Mathematical Monographs, Vol 174) by Ya-Zhe Chen and Lancheng Wu. Translated by Bei Hu. AMS. 1998, 245pp. ISBN: 0821809709. AMS member price US\$83.