

Syllabus for Math 807, Fall 2008

Numerical Methods for Partial Differential Equation I

Please read this syllabus carefully. You will be responsible for all the information given here, and for any modifications to it that may be announced in class. Updated information and handouts can be accessed at my website: www.math.ohio-state.edu/~kao/

Instructor: Chiu-Yen Kao

Texts: (1) Numerical Solution of Partial Differential Equations: Finite Difference Methods by G.D. Smith, Second Edition

Lecture: WMF 12:30pm @ BE0134A

Topics: Finite difference methods for parabolic, hyperbolic, and elliptic PDEs

Office Hours: MW 1:30-2:30pm @ MW 410 and by appointment

E-mails: kao@math.ohio-state.edu

Tentative Schedule:

Ch1. Introduction and Finite Difference Methods
Ch2.
Explicit Finite-Difference Approximation to Parabolic Equation
Crank-Nicolson Implicit Method
Gauss's Elimination Method
Stability of the Elimination Method
Alternating Direction Implicit Method
Accuracy
Nonlinear Parabolic Equations
Ch3.
Convergence, Stability and Consistency
----- **midterm**
Ch3
Convergence, Stability and Consistency
Lax's Equivalence Theorem
Ch4.
Hyperbolic Equation
Lax-Wendroff Method
Courant-Friedrichs-Lewy condition
Shock Waves
(If time permitted, I will cover some elliptic equations)

Grading: midterm (Mon. Nov 3, 25%), final exam(Mon. Dec 8 11:30am-1:18pm, 35%), class participation (5%), and homework (35%). The letter grade will be with an approximately 90(A)-80(B)-70(C)-60(D) scale.

Class Participation: You are expected to attend all lectures, and are responsible for all information given out during them. Excessive absences without any medical reasons will result in points lost from your class participation grade. Activities such as sleeping, reading, listening to headsets, browsing the web, conversing with other students, and so on do not constitute class participation. Students engaging in such behavior during the lecture will be counted as absent.

Homework: I encourage students to discuss HW with each other. However, you should still write your own answers. No late HW will be accepted. Source codes for numerical HWs need to be also submitted electronically to kao@math.ohio-state.edu. I will check randomly whether the source code does provide the correct solution in the written solutions you hand in. The title for the e-mail need to be "807HW#-your name".

Examination: final exam will be held on Mon, Dec 8, 11:30am. University regulations require that you take it at that time. It will cover all sections listed in the class schedule. All tests must be taken at the scheduled times, except in extraordinary circumstances. If you cannot take a test at the scheduled time, you should contact me in advance. Check the grading of your exams carefully when they are returned; all grading errors should be brought to my attention as soon as possible. **No calculators will be allowed during any exams.**

***Any student who feels s/he may need an accommodation based on the impact of a disability should contact me privately to discuss your specific needs. Please contact the Office for Disability Services at 614-292-3307 in room 150 Pomerene Hall to coordinate reasonable accommodations for students with documented disabilities. <http://www.ods.ohio-state.edu>**

***It is the responsibility of the Committee on Academic Misconduct to investigate or establish procedures for the investigation of all reported cases of student academic misconduct. The term "academic misconduct" includes all forms of student academic misconduct wherever committed; illustrated by, but not limited to, cases of plagiarism and dishonest practices in connection with examinations. Instructors shall report all instances of alleged academic misconduct to the committee. For additional information, see the Code of Student Conduct http://studentaffairs.osu.edu/resource_csc.asp.**