

Course:	Numerical Methods for Ordinary Differential Equations
Professor:	Andrew Christlieb
Office:	D304 Wells Hall
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e-mail:	christlieb@math.msu.edu
Office Hours:	1:30–3:00 MW OR BY APPOINTMENT
Book 1:	<i>Computer Methods for Ordinary Differential Equations and Differential-Algebraic Equations</i> By: Ascher and Petzold
Book 2:	<i>Scientific Computing with Ordinary Differential Equations</i> By: Deuffhand and Bornemann
Book 3:	<i>Finite Difference Methods for Differential Equations</i> By: LeVeque
Book 4:	<i>An Introduction to Numerical Analysis</i> By: Atkinson
Time:	11:30–12:20 M,W
Location:	C304 Wells Hall

Course Description: Math 852 is the third course in the graduate sequence on numerical methods. The course is concerned with the development and analysis of numerical methods for ordinary differential equations (ODEs). In particular, we will focus on a class of numerical schemes known as finite difference methods. Initial value problem topics include, stability, consistency and convergence of single step and multi step methods for both non-stiff and stiff IVP's. Additional topics such as symplectic integrators and multi scale methods for problems with multiple time scales will be discussed. Time permitting, two point boundary value problems and modern numerical methods such as iterative solvers, Krylov and multi grid methods will be discussed.

Prerequisites:

1. an undergraduate course in ODE's, math 850 and math 851.
2. knowledge in a programming language (e.g., Fortran, C/C++, or MATLAB).

Homework: There will be 6 homework assignments. Most assignments will be given over a three week period. Home work is due by 4pm on the specified date. Each day an assignment is late, a 10% penalty will be assessed.

Quizzes: No Quizzes

Exams: Two Exams, one in class and one take home final. The take home final will be given out one week before the end of the term and will be due by 5pm on the date that the registers office scheduled our final exam.

Course Grade:

Homework	50% of final grade
In Class Mid-Term	25% of final grade
Take Home Final	25% of final grade

Grade Review Policy: No grades will be discussed immediately before class, in class or immediately following class. Questions about a particular grade assigned may be discussed in office hours or by appointment.

Unclaimed Assignment Policy: Assignments not retrieved on the day of return can be picked up during office hours only.

E-mail Policy: I will respond to e-mail during office hours.

	Mon.	Wed.	Fri.	
Week 1		Sep. 1	Sep. 3	
Week 2	Sep. 6	Sep. 8	Sep. 10	
Week 3	Sep. 13	Sep. 15	Sep. 17	
Week 4	Sep. 20	Sep. 22	Sep. 24	
Week 5	Sep. 27	Oct. 29	Oct. 1	
Week 6	Oct. 4	Oct. 6	Oct. 8	
Week 7	Oct. 11	Oct. 13	Oct. 15	
Week 8	Oct. 18	Oct. 20	Oct. 22	Mid-Term Exam
Week 9	Oct. 25	Oct. 27	Oct. 29	
Week 10	Nov. 1	Nov. 3	Nov. 5	
Week 11	Nov. 8	Nov. 10	Nov. 12	
Week 12	Nov. 15	Nov. 17	Nov. 19	
Week 13	Nov. 22	Nov. 24	Nov. 26	
Week 14	Nov. 29	Dec. 1	Dec. 3	
Week 15	Dec. 6	Dec. 8	Dec. 10	

Wednesday Dec. 15th 2010, Take Home Final Due by 5pm