

Math 4513 – Numerical Analysis – MWF 1:30-2:20 – CLB101 8–16–2007

Instructor: Dr. Hermann G. W. Burchard, burchar@math.okstate.edu

Office: MS 433. Ext. 45690/45688. Hrs: TTh 2:30-3:30, W 4:00-5:00

Text: G. M. Phillips & P. J. Taylor, Theory and Applications of Numerical Analysis, 2nd ed., Elsevier North America – Acad. Press (1996), paperback \approx \$69.00. ISBN 0-12-553560-0

Prerequisites: Diff. Equ., Linear Algebra (Math 2233, 3013), & computing experience

Course Outline: Numerical Analysis treats mathematical methods and algorithms for computer solutions of problems from science and engineering, that are based mainly on the calculus and matrix linear algebra. Subject matter in our text covers a year's course. We emphasize selected chapters*:

1. Introduction
 2. Basic Analysis
 3. Taylor's polynomial and series
 4. The interpolating polynomial**
 5. Best Approximation*
 6. Splines and other approximations
 7. Numerical integration and differentiation**
 8. Solution of algebraic equations of one variable**
 9. Linear equations*
 10. Matrix norms and applications*
 11. Matrix eigenvalues and eigenvectors
 12. Systems of nonlinear equations**
 13. Ordinary differential equations *
- Appendix. Computer arithmetic *

Style of Course:

- Lecture, problem solving, numerical calculations, Q&A, HW
- Calculator keystrokes for TI-89 (using memory, no-paper)
- E-mail Q&A (anonymous), web page course information

Exams:

- Maximal Semester Point Total (SPT) 600 points, as follows
- Three hour exams @ 100 pts: Wed Sept 19, Wed Oct 24, Wed Nov 21
- Weekly quizzes @ 10 pts except exam weeks, max total credit 100 pts
- Final exam @ 200 pts Fri Dec 14, 2:00-3:50 pm
- All exams comprehensiver – All deadlines flexible – All schedules tentative

Grading Procedures:

- Grade determined by $SPT \leq 600$ pts
- Grade of A guaranteed for 540 pts=90%, B for 480 pts=80%, etc
- A *curve* may be applied to SPT, rarely more than 1%
- Consistently high scores expected for grade of A, if *curved*
- Similar but lower expectations for grade of B or C, if *curved*
- Full credit for answers with complete solution details
- Partial credit for incomplete work generous, often lenient

Etcetera:

- Make-ups: Major exams only with valid excuse (OSU rules)
- No make-ups: All quizzes, projects, including official absences
- Daily attendance: Essential in a math course, strongly recommended
- Labor Day: Mon Sept 3
- Fall Break: Sat Oct 6 - Tues Oct 9
- OSU Break: Fri Nov 16
- Thanksgiving: Thur Nov 22 - Sun Nov 23
- Pre-Finals Week: Mon Dec 3 – Fri Dec 7
- Finals Week: Mon Dec 10 – Fri Dec 14