Math 4600/5600 - 100 Numerical Analysis

(Class Number 4012/4027)
Fall 2016-2017

Class homepage: http://www.ohio.edu/people/shenx/class/math5600/math5600.html
Time: MWF 3:05-4:00 pm, 314 Morton Hall
Instructor: Dr. Annie X. Shen
Office: 571 Morton Hall
Office Hours: 2:00-3:00 pm WF, or by appointments
Email: shenx@ohio.edu
Phone: 740-593-1288

Catalog description. A survey of the ideas, methods, and algorithms in Numerical Analysis.

Prerequisites. You must have earned a passing grade in each of the following courses: MATH 3400 (elementary Des) and (3200 Applied Linear Algebra or 3210 Linear Algebra) and (3600 Applied Num Methods or CS 2300 or 2400 or ET 2100). Homework will involve the use of MATLAB programming (at entry level).

Expected outcomes. Students will be able to:
- Understand basic theorems and ideas of numerical methods;
- Construct algorithms to solve mathematical problems;
- Analyze the accuracy of such algorithms and associated computational cost and efficiency;
- Be able to perform numerical experiments related to such algorithm using computers and identify the sources of failure, and avoid them.

Required textbooks
An Introduction to Numerical Methods and Analysis,

Optional
Solutions Manual to accompany An Introduction to Numerical Methods and Analysis 2nd Edition

(1) Numerical Computing with MATLAB, Cleve Moler

Homework and projects
Homework will be assigned during every lecture. Unless otherwise specified, each homework/project assignment will be due before class at the due date. No late homework will be accepted. Electronic submissions will not be accepted under any circumstances. Due to limited reader time, randomly selected problems from each assignment will be graded.

Attendance and Exam information. In the event of a major campus emergency, course requirements, deadlines and grading percentages are subject to changes that may be necessitated by a revised calendar or other circumstances beyond the instructor’s control. Emails are ways to get information about changes in this course. Attendance at the scheduled examinations and final exam is required. There is no provision for absences due to vacations, family outings and other social activities, other special plans and appointments, etc. There will be no make-up tests. For absences due to medical reason, missed work will be replaced by the corresponding percentage earned on the
final exam. In such a case, a medical excuse on physician's letterhead, signed by the physician must be submitted before the scheduled exam.

**Grading Policy**

*All exams should be done independently; otherwise you will be guilty of plagiarism. A student who is caught cheating will get an F for the course and will be referred to student judiciaries for further action.*

<table>
<thead>
<tr>
<th>Score</th>
<th>[0, 60)</th>
<th>[60, 70)</th>
<th>[70, 80)</th>
<th>[80, 90)</th>
<th>[90,100]</th>
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<tbody>
<tr>
<td>Letter grade</td>
<td>F</td>
<td>D</td>
<td>C</td>
<td>B</td>
<td>A</td>
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Extra credit problems will not be assigned. Letter grades will be assigned at the end of the academic term and are based on (schedules are subject to change).

- **Homework** 20%, for submission dates, see class website
- **2 Midterm exams** 25%, each, Wed, week 5 and week 10
- **Final Exam** 30%, Wed, December 7, at 12:20.

**Copyrights of class materials.** The lectures, classroom activities, and all materials associated with this class and developed by the instructor are copyrighted in the name of the instructor on the date 4/26/2016.

**Accommodation for disability.** Any student who suspects s/he may need an accommodation based on the impact of a disability should contact the class instructor privately to discuss the student’s specific needs within the first week of class and must provide written documentation from the Office of Student Accessibility Services. If the student is not yet registered as a student with a disability, s/he should contact the Office of Student Accessibility Services.

**Coverage**

- Chapter 1 Introduction and Calculus Review
- Chapter 2 A survey of Simple Methods and Tools
- Chapter 3.1 – 3.3, 3.8-3.10 Root-Finding
- Chapter 4.1-4.8 Interpolation and Approximation
- Chapter 5.1-5.7 Numerical Integration

* Chapter 6.1-6.3 Numerical Methods for Ordinary Differential Equations

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