

21:640:473:01/Numerical Analysis/Spring 2012

Class meetings: MTh 1–2:20, Smith 241

Instructor: John Randall
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Office hours: M 9–10, WTh 11:30–1

Course web site: <http://pegasus.rutgers.edu/~randall/473> and Rutgers Blackboard.

Textbook: J. Douglas Faires & Richard L. Burden, *Numerical Methods*, 3rd edition, Cengage, 2003. ISBN 9780534407612

Prerequisites: Calculus II, Computers & Programming I

Assessment

We will have weekly quizzes (15% total), 2 in-class exams (15% each), a comprehensive final exam (40%), and projects (15% total).

Topics

We will cover the following topics, not necessarily in order. For each numerical method we will discuss error and computer implementation. Projects will be discussed in detail. Practical instruction will be given on using calculators and spreadsheets effectively, and in using mathematical programming languages.

1. Errors and computer arithmetic.
2. Root finding: bisection method, Newton's method.
3. Interpolation: Lagrange interpolation, divided differences, cubic spline interpolation.
4. Numerical integration and differentiation.
5. Approximation theory: least squares approximation.
6. Numerical solution of the heat equation and Black-Scholes equation.
7. Discrete Fourier transforms.

Other topics will be covered as time permits.

Attendance Policy

Students are expected to attend all classes and to complete all assignments. No makeups will be given for quizzes. No makeups will be given for exams except for absences due to the recognized grounds described in the catalog.

Important dates

Tue	Jan	17	Classes start
Tue	Jan	24	Last day to drop classes
Wed	Jan	25	Last day to add classes
Thu	Mar	1	Exam #1
Sat	Mar	10	Spring recess begins
Sun	Mar	18	Spring recess ends
Tue	Mar	27	Last day to drop classes with a 'W'
Thu	Apr	19	Exam #2
Mon	Apr	30	Classes end
Mon	May	7	Final exam, 11:45–2:45