MATH 514
Numerical Analysis

Instructor: Giovanna Guidoboni

Course Description:
Numerical analysis is concerned with finding numerical solutions to problems, especially those for which analytical solutions do not exist or are not readily obtainable. This course provides an introduction to the subject and treats the topics of approximating functions by polynomials, solving linear systems of equations, and solving nonlinear equations. These topics are of great practical importance in science, engineering, medicine and finance, and also have intrinsic mathematical interest. The course concentrates on theoretical analysis and on the development of practical algorithms.

Why should I take this class?
This course can benefit graduate students as well as senior undergraduates. The goal of this course is to shape scientists who are not mere users of computational tools, but leaders in employing computational and mathematical thinking to solve complex scientific and engineering problems that defy traditional non-computational solutions. This course is also important for the qualifying exam system for our graduate program in mathematics, since the IUPUI Graduate Student Handbook for Purdue Programs includes this course, Numerical Analysis MATH 514, as one of the area exams.

Homework: There will be weekly homework assignments which will not be collected or graded. As a rule, one problem similar to those assigned in the homework will appear on each of the three tests. Homework includes both paper-pencil work and computer work (using Matlab or other programming language of student’s choice).

Programming: There will be three programming assignments throughout the course. Students may choose their favorite programming language.

Tests: There will be three in-class tests throughout the course. Tests are closed-books and 75 minutes long.

Final Exam: There will be one comprehensive final exam at the end of the course. The final is closed-books and two hours long.

Grading and Policies
Programming assignments, tests and final exam will contribute to the final grade as follows: Programming: 25%, Each test: 15%, Final Exam: 30%. Students should expect A (100-90), B (89-80), C (79-70), D (69-60), F (59-0).
This course complies with the campus-wide policies available at http://registrar.iupui.edu/course_policies.html.