

Methods of Applied Mathematics I – Math 556 X1

Fall 2008

Syllabus

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Course Web Page: <http://www.math.uiuc.edu/~rdeville/teaching/556/>

Departmental syllabus: <http://www.math.uiuc.edu/Bourbaki/Syllabi/syl1556.html>

Optional Text: Keener, J. P. *Principles of Applied Mathematics*, 2000.

Lecture Time and Location: MWF, 12–12:50, Altgeld 447.

Office Hours: Illini Hall 344B, time TBD

Subject material: We will use Keener's book as a topical guide and use various supplemental materials throughout the course. As per the departmental syllabus, we expect to cover, roughly, Chapters 1–5, 7.

Grading:

I expect to assign homeworks about once every two weeks throughout the semester, and there will be a final exam. Each component worth half.

Course goals and expectations:

There are several types of mathematical problems (solution of differential equations, solution of integral equations, calculus of variations) whose solution is important in scientific applications but whose analysis is not amenable to exact solution techniques. The overarching theme of this course is the fundamental techniques in the *qualitative* analysis of these mathematical problems.

My expectation is that the students will have broad mathematical, engineering, or scientific interests and the course will be geared toward developing tools which are mathematically sound, yet also effective in dealing with realistic scientific or engineering problems. Because of the nature of the problems we consider, we will sometimes require computational approaches and thus the students will need fluency with some computational platform (e.g. reasonable familiarity with MATLAB and Mathematica/Maple is sufficient).

I expect this to be an enriching and useful course for all who take it. My hope is that this course will give a good introduction to modern applied mathematics and that it will lay down a foundation on which the students can build towards eventually doing research in these topics.