

Math 582: Linear and Nonlinear Waves

Spring 2010
MWF 9-9:50am

Professor: Benjamin Akers
Office: SEO 1213
Office Hours : Mon 10-11am & Wed 10-11am, and by appt.
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Recommended Text(s): There is no required textbook, however a number of texts will prove valuable references. Texts which supplement portions of the course include: *Numerical Methods for Conservation Laws* by LeVeque, *Linear and Nonlinear Waves* by Whitham, *A Modern Mathematical Introduction to the Theory of Water Waves* by Johnson, *Waves in Fluids* by Lighthill, and *Wave Interactions and Fluid Flows* by Craik.

Course Description: The course covers techniques for linear, quasi-nonlinear, and weakly-nonlinear wave problems. We will present the method of characteristics, perturbative methods, and multiple scale expansions. In addition we will derive the Korteweg-de Vries and Nonlinear Schrödinger equations.

Grading: The course grade will be determined by the sum of the best four of five homeworks (25% each). **Late homework will not be accepted.** Homework may be turned in early. All homework assignments will be posted on the course webpage :

<http://www.math.uic.edu/~akers/Math582S10.html>

Course Policies:

- Academic dishonesty will not be tolerated in any aspect of the course. Students should consult the office of judicial affairs for university policy with regard to academic dishonesty.
- Students with disabilities should contact the Disability Resource Center for accommodation at the beginning of the semester. Accommodations can not be given retroactively for work already performed.
- Students who will miss large portions of class due to unforeseen circumstances should contact the instructor during the semester to discuss their options. After course grades are assigned they are final; this is not the time to discuss long absences.
- Students are responsible to attend class during scheduled meetings.

Professionalism: Students will act as professionals. This pertains to all course correspondence, assignments, and class conduct.