

MAT 518 Topics in Applied Mathematics
A. Lutoborski, Syracuse University
Fall 2009.

Classes: Section 001, M-W-F, 9:30-10:25, Carnegie Building, Room 316.

Instructor: Professor Adam Lutoborski, Department of Mathematics,
213 B Carnegie, phone: 443-1489, e-mail: alutobor@syr.edu

Office Hours: Mondays 3:30-4:30, Tuesdays 3:30-4:30.

Text: "An Introduction to Wavelet Analysis" by David F. Walnut, Birkhauser 2004. Auxiliary reference for complementary readings: "Ripples in Mathematics The Discrete Wavelet Transform" by A. Jensen, A. la Cour-Harbo, Springer, 2001.

Prerequisites: MAT 514.

Course Description: We will discuss transform methods, both continuous and discrete for representing and analyzing functions. We begin with the Fourier analysis which is now a classical tool in applied mathematics and devote the second part of the course to wavelets. Wavelets were developed in the last 20 years finding applications in signal processing, numerical analysis, astronomy and physics. We will cover Chapters 1-7 from the text. Main topics are: inner product spaces, Fourier series, Fourier transform, Discrete Fourier transform, Haar wavelets, wavelet transforms, multiresolution analysis.

Exams, Homeworks, Final Exam: There will be two 55 min exams and a cumulative final exam given in this course. Homework will be given every week and will be handed in; selected problems will be graded. Dates of the exams will be announced approximately a week before the exam. Final Exam: Wednesday December 16, 7:15-9:15 pm.

Course Grades: Course grades will be determined by: 2 exams: 50% (25% each), final exam: 30%, homework 20%, total = $0.25 * (T1 + T2) + 0.3 * \text{final} + 0.167 * H$. There will be no make-up exams for any reason. A missed test counts as zero unless the student presents a note from the doctor or from the dean's office stating explicitly that the student was not able to attend. With the note, the final exam grade will be used to fill the missing grade. Everyone is required to take the final exam.

Disabilities: If you believe that you need accommodations for a disability, please contact the Office of Disability Services(ODS), <http://disabilityservices.syr.edu>, located in Room 309 of 804 University Avenue, or call (315) 443-4498 for an appointment to discuss your needs and the process for requesting accommodations. ODS is responsible for coordinating disability-related accommodations and will issue students with documented disabilities Accommodation Authorization Letters, as appropriate. Since accommodations may require early planning and generally are not provided retroactively, please contact ODS as soon as possible.