

SYLLABUS FOR MATH 416, SPRING 2014

Monday, Wednesday, Friday 11:00 a.m. - 11:50 a.m.
MTH B0425

Prerequisites: MATH 141, MATH 240, or permission of the instructor. Familiarity with MATLAB is also required.

Text: Mathematics for Multimedia, Mladen Victor Wickerhauser, Birkhauser - Springer, 2009 (Required)

Instructor: Dr. Wojciech Czaja

Office: MTH 2105

Office Hours: Wednesday 12:00 - 12:50, Friday 10:00 - 10:50, or by appointment

Phone: (301) 405 - 5106

Email: wojtek (at) math (dot) umd (dot) edu

Class Web Page: www.math.umd.edu/~wojtek/416_13.htm

Exams: There will be 3 midterm exams during the semester, each for the total of 100 points. The lowest score is dropped. They are tentatively scheduled on October 13, November 5, and December 3. The final exam is worth 200 points.

Calculators: Calculators will NOT be allowed for the exams, but small (5 x 3 in.) note cards will be allowed during the exams.

Homework: On Friday of the week that has no exam scheduled, homework will be assigned. (Homeworks are due the next Wednesday at the start of the class.) Each one is worth 25 points, and there will be 10 such assignments. The lowest 2 scores (including absences) are dropped. Late homework will not be accepted.

Grading: The maximum point total is 600 points and the total used to calculate the final grade is the minimum of the two numbers: 600 points and the largest score in the class. The setting of letter grades will be based on the number of points and will be no worse than: 50% - D, 60% - C, 75% - B, 90% - A.

Academic integrity: The University makes me remind you about its academic integrity policies. So I do. Nobody, however, has to remind me that part of my job is to make sure that these policies are obeyed.

Attendance and absences: You are responsible for the material covered in class, whether you attend or not. You are also responsible for the announcements made during class; they may include changes in the syllabus.

The instructor will adhere strictly to the official university policy on makeup exams. In particular, it is the policy of the University to excuse the absences of students that result from the following causes: illness of the student, or illness of a dependent; religious observance (where the nature of the observance prevents the student from being

present during the class period); participation in university activities at the request of University authorities; and compelling circumstance beyond the student's control. Students claiming excused absence must apply in writing and furnish documentary support for their assertion that absence resulted from one of these causes. Moreover, foreseeable absences (such as those resulting from religious holidays or participation in university-sponsored events) must be submitted in writing to the instructor by September 15.

Disabilities: If you have a disability disallowing you to test under the usual time or in-class conditions, you may contact the office of Disabled Students Services (DSS) in Shoemaker. **(Please let me know by Sept. 15 if you think you may require these services.)** If they assess you as meriting private conditions and/or extra time, then you may arrange to take your tests at DSS, with extra time as they indicate. You must arrange this well in advance of a test (in particular: no retakes). **Remember: I need to sign the document.**

Emergency closures: In case of an emergency that closes the University for an extended period of time (for example, due to inclement weather), be sure to access your email for instructions from me. Also check the University's home page or call 301-405-SNOW for snow closure information. Should any classes or exams be cancelled, please check the class schedule page for updated schedule information.

Course evaluations: Your participation in the evaluation of courses through CourseEvalUM is important to us, and helps improve teaching and learning at the University. CourseEvalUM will be open for you to complete your evaluations for the Fall semester. Evaluations are anonymous and will not be available to faculty and TAs until next semester, so they cannot possibly affect your grade.

OUTLINE OF MATERIAL

Background Material: Numbers and Computer Arithmetic; Vector Spaces and Linear Transformations [2 weeks]

Finite frames and bases [2 weeks]

Fourier Series, Discrete Fourier Transform [3 weeks]

Sampling, Quantization, Precision, and Accuracy [2 weeks]

Wavelet Bases, Discrete Wavelet Transform, [3 weeks]

Applications to Coding, Detection, and Compression [3 weeks]