Department of Electrical and Computer Engineering
The Johns Hopkins University

520.443 Digital Multimedia Coding and Processing
Spring 2007

Instructor  Prof. Trac D. Tran
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Course Homepage  http://thanglong.ece.jhu.edu/Course/443/

Lectures  Wednesday, 2:00 - 5:00, 123 Barton Hall.

Course Description
An introduction to the coding and processing of digital multimedia. The course covers current
techniques for processing, storage and delivery of media such as speech, audio, images, and video.
This requires an in-depth understanding of digital signal processing for 1D signals, as well as the
extensions to 2D and 3D cases. The emphasis will be on the theoretical basis as well as efficient
implementations. Key components studied in details are digital filters, transforms, quantizers, bit
allocators, entropy coders, motion estimation and compensation algorithms. Current and future
audio/image/video compression standards and formats such as MP3, JPEG, JPEG2000, MPEG
family, H.263, H.264... are frequently used as illustrations.

Required Textbook
  012620862X.
- J. W. Woods, Multidimensional Signal, Image, and Video Processing and Coding, Academic

Recommended Textbook
- K. R. Rao and J. J. Hwang, Techniques and Standards for Image Video and Audio Coding,
  0131900757.


**Prerequisites**

• 520.435 Digital Signal Processing.

• C/C++ and Matlab.

• Basic knowledge in linear algebra and probability.

**Programming**

• This course emphasizes hand-on learning with a lot of computer assignments and projects. There will not be any exam!

• The use of Matlab and C/C++ is encouraged.

**Homework**

• There will be around 6 problem sets and computer assignments.

• Assignments handed in late will not be accepted unless consent is obtained from the instructor prior to the due date.
Final Project

- Students are expected to work independently or in teams on a related topic of choice.
- The topic can be your own or chosen/modified from a list of suggestions to be provided by the instructor.
- A final project report and an oral demonstration/presentation are required from each team.

Grading

- Homework and Class Participation: 50%
- Final project: 50%