Instructor
Dimitrios Hatzinakos
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Office Hours: Wednesdays, 2:00 pm to 3:00 pm

Course Description
This course is a technically-oriented upper-division engineering course. The main emphasis is on the theoretical basis for multimedia processing, rather than multimedia application tools.

Lectures
Monday, 12:00-1:00 pm (WB219)
Wednesday, 12:00-1:00 pm (WB219)
Friday, 2:00 pm to 3:00 pm (WB219)
First class: Monday, January 5, 2015

Labs
Labs commence the week of January 19, 2015. (Mondays, 9:00-11:00 am, Room BA3128)More details in separate handout.

Midterms
Wed, February 11, 2015, 12:00-1:00 pm
Wed. March 11, 2015, 12:00-1:00 pm

Marking Scheme
Final Exam 50%
Midterms 30%
Lab(s) 20%
Total 100%

Course Policies

- All tests and examinations for this course are closed-book. The only permissible aids for the midterm and the examination will be a NON-PROGRAMMABLE calculator. Everyone taking the course is expected to attend all lab sessions. The lab period will be devoted to discussing concepts and implementation issues. Students are expected to come to lab prepared, and to answer related questions.

- Usage of the course webpage will be limited to people taking the course. This means that in order for students to download relevant labs and course material from the course website, they MUST register.

- Remarking Policy: remarking requests may be made up to one week after an item is returned. If the item is taken up in class (e.g., midterm), then you may request remarking up to one week after it is taken up. Only under special circumstances will remarking be considered after this time limit.

Course Outline

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<td>Graphics/Image Data Types</td>
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<td>Colour in Image and Video</td>
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<td>Distortion Measures</td>
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<td>Quantization</td>
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<td>Transform Coding (Lossy) - DCT, KLT</td>
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<td>Information Theory/Lossless Coding</td>
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<td>Predictive Coding (Lossless)</td>
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<td>JPEG Standard</td>
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<td>Wavelet Transform</td>
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<td>Wavelet Based Coding (EZW)</td>
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<td>JPEG2000 Standard</td>
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<td>Video Compression/Motion Estimation</td>
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<td>MPEG-1/2 Standards</td>
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<td>MPEG Audio Compression</td>
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Special Topics (Time Permitting):
References

Textbook (Required)

Fundamentals of Multimedia
ZeNian Li, Mark S. Drew

Additional References (Optional)

Introduction to Data Compression (3rd Edition)
K. Sayood

Multimedia Signals and Systems
Mrinal Kr. Mandal

Color Image Processing and Applications
K.N. Plataniotis, A.N. Venetsanopoulos
Springer Verlag, ISBN 3-540-66953-1, August 2000

Digital Video Processing
A. Murat Tekalp
Prentice-Hall, 1995

IEEE Signal Processing Magazine: Transform Coding (Special Issue)
IEEE, September 2001

IEEE Signal Processing Magazine: Immersed in Multimedia (Special Issue)
IEEE, January 1999

Design and Implementation of Next Generation Video Coding Systems (H.265/HEVC Tutorial) Vivienne Sze (sze@mit.edu) Madhukar Budagavi (m.budagavi@samsung.com) ISCAS Tutorial 2014