



## ECE 1512 Digital Image Processing & Applications FALL 2011 Course outline

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### Instructor

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**Overview:** This is an introductory level course for graduate students or practitioners to gain knowledge and hand-on experiences in image processing and applications. Topics include: Introduction to 2-D signal analysis, 2-D transforms, image filtering, edge detection, segmentation, color imaging, color feature extraction, digital camera processing, and applications such as secure color imaging, face and eye detection.

**Text:** No specific text will be assigned. Class Notes will be posted online.

### Recommended references:

- **R.C. Gonzalez, R.E. Woods, Digital Image Processing, 3<sup>rd</sup> Edition, ISBN: 978-0-168728-8, 2008, [Chapters: 1,2,3,8, 10].**
- **K.N. Plataniotis, A.N. Venetsanopoulos, Color Image Processing and Applications, Springer Verlag, Berlin, ISBN 3-540-66953-1, August 2000 (material available to registered students).**
- **R. Lukac and K.N. Plataniotis, Color Image Processing: Methods and Applications, CRC Press, ISBN 0-8493-9774-X, October 2006, (material available to registered students).**

**Place & Time:** BA TBD; Tuesday, 2.00 – 5.00 pm.  
(Starting Tuesday, September 20, 2011)

**Office hours:** By appointment



### ECE1512: Composition of the Final Mark

Problems and exercises: 20%

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Two problems or computer exercises will be assigned during the semester. A written report is due a week later.

Project: 80% (in class presentation: 40%, final report: 40%)

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A project will be assigned or chosen by October 18, 2011. Students are expected to make a presentation on their approach and methodology in addressing the project tasks, during the last two lectures. Interactive discussion and feedback from the class is expected. Final project reports are due Tuesday, December 13, 2011.

### Tentative Course plan

**September 20: Lecture 1**

Introduction to Imaging Systems.

**September 27: Lecture 2**

2-D Signal/Image Processing Fundamentals.

**September 27: Lecture 3**

2-D Image Transforms.

**October 4: Lecture 4**

Introduction to Color Image Processing.

**October 11: Lecture 5**

Intensity & Color Transformation: Spatial Filtering.

**October 18: Lecture 6**

Edge Detection.

**October 25: Lecture 7**

Segmentation.

**November 1: Lecture 8**

Color Feature Extraction.

**November 8: Lecture 9**

Digital Camera Pipeline – Demosaicking.



**November 15: Lecture 10**

Applications: Secure Color Imaging.

**November 22: Lecture 11**

Applications: Face and Eye Detection.

**November 29: Lecture 12**

Discussion of Course Projects.

**December 6: Lecture 13**

Presentation of Course Projects.

**December 13: Lecture 14**

Presentation of Course Projects.