

ECE 4367: Image Processing

Credit / Contact hours: 3 / 3 per week

Course coordinator: Hamed Sari-Sarraf

Textbook(s) and/or other required material: R. C. Gonzalez and R. E. Woods, Digital Image Processing, 3rd Edition, Prentice Hall, 2008.

Catalog description: Imaging fundamentals. Linear operations in both spatial and frequency domains. Image enhancement and restoration techniques. Analysis and coding of images.

Pre-requisite: ECE 3323

Co-requisites (if any): None

Designation: Elective

Course learning outcomes: Upon completion of this course, students should be able to do the following:

1. Identify the characteristics of an image that can be changed by digital image processing
2. Enhance images in the spatial and frequency domain.
3. Apply morphological operators for image processing tasks.
4. Apply standard image segmentation techniques
5. Apply knowledge gained to devise and implement a solution to a current, real problem and present and demonstrate their findings

ABET Student Outcomes addressed: a, c, e, and k.

Topics covered:

Introduction to the field – 1 week

Sensing and Image formation – 1 week

Image enhancement in spatial and frequency domains – 3 weeks

Image restoration – 2 weeks

Morphological image processing – 2 weeks

Classical image segmentation and registration – 2 weeks

Deformable Models and PDE-based Image Processing – 3 weeks