Electrical Engineering 5450: Digital Image Processing
Prior Number – Electrical Engineering 345

Credit and Contact Hours
3 credit hours lecture (Three 50-minute or two 75-minute sessions per week are typical).

Instructor
Randy Moss, Ph.D.

Text(s)

Course Information
Course Description
Fundamentals of human perception, sampling and quantization, image transforms, enhancement, restoration, image and video compression and coding.

Prerequisites
Electrical Engineering 3410 (215)
(Co-listed with Computer Engineering 5450 (345))

Required or Elective
Selected elective

Course Goals
General Outcomes
1. Understand image formation and the role human visual system plays in perception of gray and color image data.
2. Get broad exposure to and understanding of various applications of image processing in industry, medicine, and defense.
3. Learn the signal processing algorithms and techniques in image enhancement and image restoration.
4. Acquire an appreciation for the image processing issues and techniques and be able to apply these techniques to real world problems.
5. Be able to conduct independent study and analysis of image processing problems and techniques.
Relationship of Course to Program Outcomes

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S – strong connection; M – medium connection; W – weak connection

Topics Covered

1. Introduction Digital Image Processing (1 week)
2. Image Fundamentals and Human Visual Perception (1 week)
3. Image Enhancement in Spatial Domain (2 weeks)
4. Image Transforms (1 week)
5. Image Enhancement in Frequency Domain (1.5 week)
6. Image Restoration (2 week)
7. Image Morphology – Introductory (1 week)
8. Color Image Processing – Introductory (1 week)
9. Image Compression and Coding (2.5 week)
10. Wavelet Transforms – Introductory (1 week)
11. Student Presentations, Reviews, Examinations, and Final (3 weeks)