

1. ECE 513: Digital Image Processing
2. 3 credits: 2-75 minute lecture sessions/week
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4. Digital Image Processing. Gonzalez, R.C. & Woods, R.E. 2017.
5. Course Information
 - a. Image acquisition and display systems, image enhancement, restoration and encoding, image analysis; real-life applications
 - b. Prerequisites: ECE 303 with a C or higher or STAT 303 with a C or higher; ECE 312
 - c. Selected Elective: Computer Engineering; Electrical Engineering
6. Goals for the Course
 - a. Course Learning Objectives
 - i. Identify and illustrate the fundamental theory and algorithms used in the field of digital image processing
 - ii. Design and implement an image processing algorithm for a given problem
 - iii. Analyze the performance of the designed methods using different performance metrics
 - iv. Identify a wide range of application areas in digital image processing
 - b. Student Outcomes
 1. An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics
 2. An ability to apply the engineering design process to produce solutions that meet specified needs with consideration for public health and safety, and welfare, as well as global, cultural, social, environmental, and economic factors
 6. An ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions
7. Topics Covered
 - DIP areas and applications.
 - Image Digitization: Sampling and quantization.
 - Image Transforms
 - Image Enhancement
 - Image Restoration
 - Image Compression and Encoding
 - Feature Extraction and Segmentation
 - Pattern Classification
 - Applications in satellite, sonar, radar and medical areas