Al Imam Mohammad ibn Saud Islamic University
College of Computer and Information Sciences

Computer Science Department

Course Syllabus

CS451 - Digital Image Processing

Catalog Description: This course covers some the following concepts:
• Digital image fundamentals: representation, sampling and quantization, image acquisition, basic relationships between pixels, imaging geometry.
• Image transformation: discrete Fourier transform, discrete cosine transform.
• Image enhancement: in spatial domain and in frequency domain, image smoothing and image sharpening;
• Image restoration: degradation models, inverse filter
• Color and pseudo-color image processing;
• Image segmentation: detection of discontinuities, thresholding, region-oriented segmentation, the use of motion in segmentation

Credit Hours: 3 Credit hours: 3 Lectures per week 0 Labs. per week 0 Recitation per week

Prerequisites: CS242

Course Learning Outcomes:
1. Have a clear understanding of the principals the Digital Image Processing terminology used to describe features of images.
2. Have a good understanding of the mathematical foundations for digital manipulation of images.
3. Be able to write programs using MATLAB language for digital manipulation of images.
4. Learn and understand the Image Enhancement in the Spatial and Frequency Domain.
5. Understand the Image Restoration, Segmentation, and Representation.

Major Topics:
• Introduction and Image processing fundamentals
• Image Enhancement in the Spatial Domain
• Image Enhancement in the Frequency Domain
• Image restoration
• Image Segmentation

Text Books: Digital Image Processing, 3/E, by R. Gonzales and R. Woods, Prentice Hall, 2008

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Grading:

- The grading scale for this course is:
  - . 95 - 100 A+ Passing
  - . 90 - 94 A Passing
  - . 85 - 89 B+ Passing
  - . 80 - 84 B Passing
  - . 75 - 79 C+ Passing
  - . 70 - 74 C Passing
  - . 65 - 69 D+ Passing
  - . 60 - 64 D Passing
  - . 0 - 59 F Failing

- Final grades will be determined based on the following components:
  - . 60% Semester Work
  - . 40% Final Exam

- Students may not do any additional work for extra credit nor resubmit any graded activity to raise a final grade.

- Late submissions will not be accepted for any graded activity for any reason.

- Studentshave one week to request the re-grading of any semester work.

Attendance Policy:

Students should attend 80% of the overall course hours taught in the semester as per the University regulations.

If a student fails to achieve this portion, he/she shall not be allowed to appear in the final exam and shall be awarded “DN” grade and repeat the course.

Cheating and Plagiarism Policy:

The instructor will use several manual and automated means to detect cheating and/or plagiarism in any work submitted by students for this course.

When a student is suspected of cheating or plagiarism, the instructor raises the issue to the disciplinary committee.

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Communications: Registered students will be given access to a section of the Blackboard Learning System for this course. Bb will used as the primary mechanism to disseminate course information, including announcements, lecture slides, assignments, and grades.

Communication with the instructor on issues relating to the individual student should be conducted using CIS email, via telephone, or in person.