

King Fahd University of Petroleum & Minerals
Department of Electrical Engineering
EE 665 – Signal and Image Compression
First Semester (091)

Course Information

Instructor: Dr. Samir H. Abdul-Jauwad
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Textbook: Image and Video Compression for Multimedia Engineering, Fundamentals, Algorithms, and Standards, Second Edition, by Yun Q. Shi, and Huifang Sun

Course Web Site: <http://faculty.kfupm.edu.sa/ee/samara/page8.htm>

References:

1. **Digital Image Processing**, 2nd Edition, by Rafael C. Gonzalez and Richard E. Woods
2. **Digital Image Processing Using MATLAB**, by Rafael C. Gonzalez, Richard E. Woods, and Steven Eddins
3. **Applications of Digital Signal Processing**, by Alan V. Oppenheim, Editor
4. **Signals and Systems**, by A.V. Oppenheim, A.S. Wilsky, and I.T. Young
5. **Digital Image Processing**, by W.K. Pratt
6. **Digital Image Processing for Remote Sensing'** by Ralph Bernstein, Editor
7. **Fundamentals of Digital Image Processing**, by Anil K. Jain
8. **Digital Image Restoration**, by H.C. Andrews, and B.R. Hunt

Tentative Course Outlines:

Fundamentals

Introduction
Quantization
Differential Coding
Transform Coding
Variable-Length Coding: Information Theory Results (II)
Run-Length and Dictionary Coding: Information Theory Results (III)

Still Image Compression

Still Image Coding: Standard JPEG
Wavelet Transform for Image Coding: JPEG2000
Nonstandard Still Image Coding

Motion Estimation and Compensation

Motion Analysis and Motion Compensation

Block Matching

Pel-Recursive Technique

Optical Flow

Further Discussion and Summary on 2-D

Motion Estimation

Video Compression

Fundamentals of Digital Video Coding

Digital Video Coding Standards: MPEG-1/2 Video

Application Issues of MPEG-1/2 Video Coding

MPEG-4 Video Standard: Content-Based Video Coding

ITU-T Video Coding Standards H.261 and H.263

A New Video Coding Standard: H.264=AVC

MPEG System: Video, Audio, and Data Multiplexing

Grade Distribution:

Major Exam: 10%

Projects: 60%

Final Exam: 30%