

CEG4311 Fall 2003
Summary of Lectures

Lecture	Date	Topics covered	Reference
1	Sept. 5	Introduction to image processing, course outline	Powerpoint slides
2	Sept. 10	Continuous space-time signals, special multiD signals, visualization of 2D signals, Signal spaces, linear systems	Course notes, pp. 2-1 – 2-13
3	Sept. 12	Linear systems, impulse response, frequency response, Fourier transform, transform properties	Course notes, pp. 2-14 – 2-21
4	Sept. 17	Evaluation of multiD Fourier transform, examples, Introduction to discrete space-time signals, lattices	Course notes, pp. 2-22 – 2-30
5	Sept. 19	Sampling structures, signals defined on lattices, linear systems, frequency response	Course notes, pp. 2-31 – 2-39
6	Sept. 24	Discrete-space Fourier transform, FIR filters	Course notes, pp. 2-39-2-44
7	Sept. 26	Separable filters, computing the Fourier transform, Sampling	Course notes, pp. 2-44 – 2-55
8	Oct. 1	Reconstruction, practical sampling, moving average and Gaussian filters	Course notes, pp. 2-56 – 2-65
9	Oct. 3	Filter design, introduction to sampling structure conversion	Course notes, pp. 2-66 – 2-76
10	Oct. 8	Upsampling, downsampling	Course notes, pp. 2-76 – 2-87
11	Oct. 10	Arbitrary sampling structure conversion	Course notes, pp. 2-87 – 2-93
12	Oct. 15	Introduction to light and color, colorimetry, color space	Course notes, pp. 3-1 – 3-9
13	Oct. 17	U of O day	none
14	Oct. 22	primaries, transformation of primaries, specification of primaries	3-10 – 3-17
15	Oct. 24	luminance, chromaticity, linear color spaces	3-18 – 3-27
16	Oct. 29	midterm exam	none
17	Oct. 31	perceptually uniform color spaces, nonlinear color spaces	3-28 – 3-35
18	Nov. 5	intro to image representations, vector-space representation of images	4-1 – 4-11
19	Nov. 7	DFT and DCT bases, disjoint-block bases	4-11 – 4-21

20	Nov. 12	Filterbanks, wavelet basis	4-21 – 4-29
21	Nov. 14	Introduction to image compression, quantization, uniform quantization	Course notes, pp. 5.1 – 5-18
22	Nov. 19	Quantization of transform coefficients, decomposition of quantizer, binary code assignment, Huffman coding	Course notes, pp. 5.19 – 5-44
23	Nov. 21	Block coding, Golomb-Rice coding, code assignment for JPEG	Course notes, pp. 5-45 – 5-59
24	Nov. 26	Lossless compression of multilevel images, video coding, motion compensation, MPEG	Course notes, pp. 5-60 – 5-68, Chapter 96 of the Communications Handbook