

Digital Video, ECE 5354 and ECE 6354, Fall 2016

Course Website: <http://www.uh.edu/~hebert>. Check this site regularly.

Time/Place: 2:30 pm – 3:50 pm TTh (29 class meetings) AH 7

1st class meeting: Tues Aug 23 (29 class meetings).

Last Day to Add a Class: Monday Aug 29.

Last day to drop with no grade: Wednesday Sept 7.

Semester Holidays: Thursday Nov 24 (Thanksgiving)

Last day to drop with a grade of W: Friday Oct 28.

Last class meeting: Thurs Dec 1.

Class Meeting Make-up Day: Mon Dec 5.

ECE 6354 Pre-req: Graduate ECE standing.

ECE 5354 Pre-req: ECE 3337, co-enrollment/completion ECE 4436 Microprocessor Systems

Instructor: Dr. Tom Hebert, N316, (office) 713-743-4448, (fax) 713-743-4444,
(e-mail) thebert@uh.edu , Office hrs: T,Th 10-11 am and 4-5 pm or E-mail for meeting.

Teaching Assistant: TBD.

Course Text: Complete set of handouts for the course.

References books: “Techniques/Standards for Image, Video, Audio Coding” – Rao, Hwang; “MPEG Video Compression Standard” – Joan Mitchell

Homework: weekly, about 12 in all.

Test 1: Tues Oct 11 (subject to change). Closed book, handout provided. No make-up exam.

Test 2: Mon Dec 5 or Thurs Dec 8 (TBD), 2:00-4:00 pm; Closed book, handout provided.

Due date for student animated digital videos: Wed, Nov 31.

Presentations/grading of student animated digital videos: Thurs Dec 1.

Grades: The following grade ranges will determine your course grade.

(A-,A: 90-100) (B-,B,B+: 78-90) (C-,C,C+: 66-78)

(D-,D,D+: 54-66) (F: < 54.00)

Grade weightings: HWs 3%, projects 4%, test 1: 44%, test 2: 49%.

Academic Honesty Policy:

Students in this course are expected to follow the Academic Honesty Policy of the University of Houston. It is your responsibility to know and follow this policy.

Religious Holy Days:

Students whose religious beliefs prohibit class attendance or completion of specific assignments on designated dates may request an excused absence. To do this, submit a written request for the excused absence to Dr. Hebert no later than 5 pm of the 12th class-day, Sept 7. For more information, see the Student Handbook.

Students with Disabilities:

Students with disabilities will be provided reasonable accommodations, appropriate to this specific course. You must submit a Student Accommodation Form from the Center for Students With Disabilities to Dr. Hebert no later than 5 pm of the 12th class-day Sept 7. For more information, see the Student Handbook.

ECE 5354/6354 Course Topics:

<u>Introductory Material</u>
Analog / digital images, color models, pixels, pels.
Sampling: spatial / temporal
Digitization
Frames and fields, interlaced and non-interlaced
NTSC analog video standard
<u>Lossless / Lossy Data Coding Schemes</u>
Run-Length Coding
Arithmetic Encoding
Huffman Coding
Differential encoding
Discrete Cosine Transform coding
<u>Mathematical Animation Techniques</u>
Backgrounds, objects, motion
<u>Video / Image Coding</u>
Fax encoding
BMP Image Coding : BITMAPFILEHEADERS, BITMAPINFOHEADERS, color tables, palettes
Gif Image Compression : LZW encoding
JPEG Image Compression: DCT coding
H.261 Teleconferencing
H.263
MPEG-I Video Encoding / Decoding:
MPEG-II Video Encoding / Decoding

Expected Learning Outcomes:

In this course you will learn about the MPEG video encoding standard (DVDs) down to the bit-level. You will learn about mathematical animation and you will generate your own animated digital video with content of your own choosing.

Evaluation of learning outcomes:

1. Homework
2. Exams
3. Projects