ECE 4973 – Special Topics: Multimedia Communications
FALL 1998

1997-1999 Catalog Data: ECE 4973: Special Topics. Prerequisite: varies with course content. May be repeated with change of subject; maximum credit six hours in combination with 4990. Devoted to special topics in Electrical and Computer Engineering not covered in the current curriculum. (F,Sp,Su)

Prerequisite: 3793 or permission.


Course Objectives: Multimedia communications is a graduate level course with a cross-listed undergraduate section to permit advanced undergraduates to take the course as a technical elective. Undergraduates have reduced homework, test, and project requirements as compared to graduate students. The course provides an overview of multimedia applications and system requirements, focusing on technology issues that remain to be resolved before services such as video-on-demand, video telephony, and content-based retrieval can be widely deployed. Students learn to design and analyze contemporary data network architectures and protocols. The JPEG image compression standard is studied in detail, and students gain the ability both to encode and to decode JPEG compliant data streams. Leveraging on the students’ thorough understanding of JPEG, the H.263 and MPEG video coding standards are covered more rapidly. The course concludes with a survey of current applications in which student groups are required to read recent journal articles and report to the class.

Coordinator: Dr. Joseph P. Havlicek, Assistant Professor, School of Electrical and Computer Engineering.

Prerequisites by Topic: Linear system theory, digital signals and filters, continuous and discrete Fourier transforms

Topics:
1. Multimedia applications and system requirements
2. Packet switching and circuit switching
3. The ISO-OSI layered network architecture
4. Modulation techniques
5. Error control coding
6. DLC protocols and framing
7. End-to-end error recovery and flow control
8. Signal compression techniques
9. JPEG
10. Motion compensation
11. H.263 and MPEG video coding
12. Survey of contemporary applications
ECE 4973 – Special Topics: Multimedia Communications (continued)

Schedule: Lecture – 50 minutes three times per week or 75 minutes twice per week.

Assessment Methods Used:
- Standard course evaluation

Contribution to Professional Component:
Engineering Science – 3 credit hours or 100%

Program Objectives, Related Strategy, and Actions:
1: i
2: i, iv, (the analysis component that needs to be added)
3. ii

ABET 2000 Criterion 3 Contents:
a,b,e,j

Prepared by: Joseph P. Havlicek Date: June 7, 1999