I. Catalogue Description

4624 MULTIMEDIA, HYPERTEXT AND INFORMATION ACCESS

Introduces the architectures, concepts, data, hardware, methods, models, software, standards, structures, streams, technologies, quality concerns, and other issues involved with: multimedia information and systems, hypertext and hypermedia, networked information, videoconferencing, authoring / electronic publishing, and information access. Coverage includes how to capture, represent, link, store, compress, browse, search, retrieve, manipulate, interact with, synchronize, perform, and present: text, drawings, still images, animations, audio, video, and their combinations (including in digital libraries).

Pre: 2606 (3H, 3C)

Course Number: 4624

ADP TITLE: Multimedia/Hypertext/Info

II. Learning Objectives

Having successfully completed this course, students will be able to:

- effectively author hypertext, hypermedia, and/or multimedia works;
- learn and demonstrate expertise in using specialized software for this area;
- critique software and hardware systems in this area, considering functionality, interface, quality of presentation, and other important criteria;
- design a solution to a significant open-ended problem in multimedia, hypertext and information access;
- document and present (using written, oral and visual means) the design process and the results from a proposed solution to a problem in this area;
- evaluate or assess a proposed solution to a problem in this area;
- function effectively in teams.

III. Justification

The study of information, information systems, and information management is one of the core activities in computing. Computer science application areas of multimedia information and systems, hypertext and hypermedia, and
networked information access (e.g., WWW, search engines) are an important and rapidly growing part of the discipline. Graduating computer science students and those in other disciplines (e.g., Education, Human Factors, and Computer Engineering) should have an opportunity to study this important area.

This course will serve as the capstone course for the department’s track on Knowledge, Information, and Data. It also will serve as capstone for other students who satisfy the prerequisite requirements and who choose to focus in this area of CS but who are not in the track.

This proposal represents a significant revision of the existing CS 4624, reflecting the rapid evolution of the field since the previous course description was approved (1995). In addition, modifications were made to fulfill this course’s role as one of the new capstone courses in computer science.

IV. Prerequisites and Corequisites

Students need the knowledge of data structures as taught in 2606 in order to understand implementation details of the tools and techniques covered in this course.

V. Texts and Special Teaching Aids


Supplementary Materials: Collections, equipment, and software packages for student use or demonstrations are available through the New Media Center and other locations, and include for capture/editing of images, audio, and video.

VI. Syllabus

<table>
<thead>
<tr>
<th>Percent of Course</th>
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<tbody>
<tr>
<td>1. Introduction</td>
<td>10</td>
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<tr>
<td>a. Projects, Teams</td>
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<tr>
<td>b. Digital Data Representation and Communication</td>
<td></td>
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<tr>
<td>2. Digital Images</td>
<td>15</td>
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<tr>
<td>a. Representation</td>
<td></td>
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<td>b. Processing</td>
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<td>3. Digital Audio</td>
<td>12</td>
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<tr>
<td>a. Representation</td>
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<td>b. Processing</td>
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<tr>
<td>4. Digital Video</td>
<td>10</td>
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<tr>
<td>a. Representation</td>
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b. Processing
  c. Communication

5. Authoring 10
   a. Multimedia Programming
   b. Hypertext/Hypermedia

6. Information Access 10
   a. Electronic documents, markup, and publishing
   b. Search engines, information retrieval

7. Capstone Project 33
   a. Problem Definition
   b. Requirements Specification
   c. Design
   d. Implementation and Testing
   e. Documentation and Presentation

TOTAL 100

VII. Old (Current) Syllabus

<table>
<thead>
<tr>
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<tbody>
<tr>
<td></td>
<td>10</td>
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<tr>
<td>a. Electronic publishing, standards, e.g., SGML, HTML</td>
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<td>b. Using hypertext systems, e.g., Storyspace, KMS, WWW</td>
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<td>c. Multimedia applications, e.g., video-on-demand, education &amp; training, multimedia mail (MIME)</td>
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| 2. System and Application Construction 10 |
| a. Toolkits and authoring systems, e.g., AuthorWare |
| b. Architectures and reference models, e.g., IMA |

| 3. Capture and Representation 30 |
| a. Representing text, images, video, audio |
| b. Scanning, recording, digitizing, quantizing |
| c. Human visual system, psychoacoustic modeling |

| 4. Models, Structures, Compression 20 |
| a. Standards, e.g., JPEG, MPEG, HyTime, MHEG |
| b. Hypertext models, e.g., Dexter, Trellis, Amsterdam |
| c. Approaches, e.g., object classes, streams, timelines, DCT, entropy coding, vector quantization, QuickTime |

| 5. Access, Presentation, Interaction 20 |
| a. Searching and search engines, e.g., WAIS, MARIAN |
| b. Link services and engines, e.g., Hyper-G |
| c. Scripting languages and interpreters, e.g., |
ScriptX, HyperTalk, LINGO

6. Networking Considerations
   a. Video conferencing, e.g., CU-SeeMe
   b. Synchronization, quality of service
   c. Multimedia servers, distributed processing

TOTAL 100

VIII. Core Curriculum Guidelines

N/A