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METROPOLITAN STATE UNIVERSITY OF DENVER
Office of Academic and Student Affairs

REGULAR COURSE SYLLABUS

College of: <u>Letters, Arts, and Sciences</u>

Departments: <u>Mathematical and Computer Sciences</u>

Prefix & Course Number: <u>CS4760</u>　　　　**Crosslisted With*: _____**

Course Title: <u>Multimedia Technologies</u>

Transcript Course Title (30 characters): <u>Multimedia Technologies</u>

Check All That Apply:　　Required for Major: _____　　Required for Minor: _____　　Specified Elective: <u>X</u>

　　　　　　　　　　　　Required for Concentration: _____　　Elective: _____　　Service Course: _____

To receive Title IV financial aid funds, all institutions of higher education must comply with the federal definition of a credit hour. The Higher Learning Commission requires institutions to maintain policies and procedures for verifying compliane with this definition.

> *__Federal Credit Hour Definition:__ A credit hour is an amount of work represented in intended learning outcomes and verified by evidence of student achievement that is an institutionally-established equivalency that reasonably approximates not less than:*
> *(1) one hour of classroom or direct faculty instruction and a minimum of two hours of out-of-class student work each week for approximately fifteen weeks for one semester or trimester hour of credit, or ten to twelve weeks for one quarter hour of credit, or the equivalent amount of work over a different amount of time; or (2) at least an equivalent amount of work as required in paragraph (1) of this definition for other activities as established by an institution, including laboratory work, internships, practica, studio work, and other academic work leading toward to the award of credit hours. 34CFR 600.2 (11/1/2010)*

Credit Hours: <u>4</u> (<u>4</u>+<u>0</u>) **Schedule Type**: _____ **Grade Mode**: _____

　　Face-to-Face or Equivalent Hours per course:

　　Lecture <u>60</u>　Lab <u>0</u>　Internship <u>0</u>　Practicum <u>0</u>　Other: <u>0</u>

　　Additional Student Work Hours per course:

Variable topics umbrella course: No <u>X</u> Yes _____　　If Yes, number of credit hours allowed _____

Specified repeatable course: No <u>X</u> Yes _____

Prerequisite(s): <u>CS2050 (Computer System 2), CS2400 (Computer Organization 2), CPE3400 (Signal and</u>

APPROVED:

Department Curriculum Committee	Date
Department Chair **OR** Program Director	Date
Dean **OR** Associate Dean	Date
Associate VP, Academic Affairs	Date

*If crosslisted, attach completed Course Crosslisting Agreement Form

Corequisite(s): _____

Prerequisite(s) or Corequisite(s): _____

Banner Enforced Coding:
     Prerequisite(s): <u>CS2050, CS2400, CS3400</u>
     Corequisite(s): _____
     Prerequisite(s) or Corequisite(s): _____

Registration restrictions: Level <u>UG</u> Class _____ **Program/Major** _____ **Student attribute** _____

Catalog Course Description:
   The course addresses the scientific areas related to multimedia (image processing, computer graphics, video processing, speech and audio processing, text processing and networking) to a depth that enables the students to build up a thorough understanding of the technical issues associated with multimedia technologies. Topics cover how to present the different media types in multimedia stream, some theoretical foundations, multimedia standards (JPEG, MPEG), and different types of multimedia applications.

Specific Variable Topics Course Description (if applicable, umbrella course description included above):

Required Reading and Other Materials will be equivalent to:
1. J. Jackson, Web Technologies, Prentice Hall, ISBN 0-13-185603-0
2. Li Z., Drew M., Fundamentals of Multimedia. Prentice Hall, ISBN 0 13 0611872 1.

Required Calculator: TI-83 (Any version)

Specific, *Measurable* Student Behavioral Learning Objectives:
Upon completion of this course the student should be able to:
1. Know the information compression principles: run-length, differential , entropy, dictionary and transform encoding methods
2. Describe algorithms that work with images, audio, text, and video
3. Describe the phases of JPEG and MPEG standards for image, audio and video encoding
4. Explain, choose and utilize appropriate multimedia software
5. Describe the specific functions of multimedia networks

Detailed Outline of Course Content (Major Topics and Subtopics) or Outline of Field Experience/Internship (experience, responsibilities and supervision) (format: I, A, 1, a, etc.):
I. Compression Principles
    A. Run length encoding
    B. Differential encoding
    C. Shannon information theory
    D. Entropy encoding, Huffman encoding
    E. Digital dictionaries, Limpel-Ziv-Welsh encoding
II. Sampling and quantization of signals
III. Image compression principles
    A. Transformation encoding (Discrete Cosine Transformation, Wavelet encoding)
    B. Still images encoding - JPEG
IV. Video Compression:
    A. Motion estimation and compensation

B. Motion pictures encoding - MPEG.
V. Audio Compression:
  A. Differential Pulse Code Modulation,
  B. Predictive Encoding, Linear Predictive Code
  C. MPEG Audio
VI. Multimedia networks

Evaluation of Student Performance
1. Homework Assignments
2. Examinations; midterm and final exams.
3. Project
As determined by the instructor. Written communication skill will be applied in this course.