

# Computer Science Multimedia Studies

## COMPUTER SCIENCE / MULTIMEDIA STUDIES PROGRAM OBJECTIVES

Students in the Computer Science/ Multimedia Studies program prepare for a future in software development and the use of computer technology to solve complex problems. An initial core of classes introduces students to general principles of programming and multimedia development. Upon completion of the core students choose either a concentration in computer science or multimedia studies.

Students in the computer science concentration will learn to design and develop software systems for industrial, scientific, and commercial applications. They will acquire an understanding of computer operating systems, programming, data structures and algorithms, and systems analysis. Graduates will be prepared to work in the private or public sectors as programmers, analysts, or software engineers, or to proceed to advanced study.

Students completing a degree in the multimedia studies concentration will be prepared to design and develop interactive multimedia products for use in education, industry, or the non-profit sector. These graduates will be able to design and assemble CD, DVD, or Web delivered titles, and will be prepared to work in publishing, training support, or many other areas.

## LEARNING OUTCOMES

All program graduates will:

- understand the process of software design and development;
  1. be able to develop functional specifications for a product,
  2. be able to design the interface for the product, taking into account the characteristics of the material and anticipated users;
  3. choose the appropriate development environment for the product;
  4. select the appropriate data

representations and algorithms to provide optimal performance;

5. create a robust, efficient, maintainable final product; and

6. develop complete documentation for the finished package.

- understand how to integrate revisions into existing software packages

- understand how to communicate effectively with user populations and other software developers to collaboratively develop new packages.

In addition to the three core outcomes listed above, graduates in the computer science concentration will:

- demonstrate proficiency in several programming languages, including procedural and object-oriented languages;

- demonstrate understanding of computer operating systems and how to develop programs that work at the system level;

- analyze situations and develop appropriate solutions, even if the solutions do not require the use of a computer.

In addition to the core outcomes, graduates in the multimedia studies track will:

- demonstrate proficiency in the use of one or more authoring tools for the development of interactive software for stand-alone or web use;

- demonstrate general understanding of how various media (still images, video, and audio) are represented and manipulated in digital environments; and

- demonstrate ability to appropriately integrate various digital media into an interactive product.

## MEANS OF ASSESSMENT

The outcomes for each class will be clearly stated on the syllabus. Assessments for courses will address both the conceptual and applied aspects of the class. Means of assessment include projects, quizzes and

exams. The objectives for projects and other assigned work tie directly into course outcomes.

In addition to course-level assessment, the program provides for assessment of the students abilities to integrate concepts from the entire spectrum off coursework. Each student is required to develop a capstone project prior to graduation. The precise nature of the capstones vary according to specific student interests, but generally include the complete design documents for a software product and the finished product itself.

## REQUIREMENTS FOR THE BACHELOR OF SCIENCE & BACHELOR OF ARTS IN COMPUTER SCIENCE / MULTIMEDIA STUDIES

(Foreign language proficiency is a requirement for the B.A. degree.)

In addition to General Education requirements, B.S. and B.A. degree candidates for Computer Science/Multimedia Studies should complete a total of 71-81 credit hours for the CS track or a total of 71-81 credit hours for the MM Track. A grade of "C-" or better is required for each course. A minimum overall GPA of 2.00 for all courses is required for completion of the degree.

Required core courses for CS or MM concentration (for B.A. and B.S.) (27-37 Credits)

- CS 121** Introduction to Software Development (1)
- CS 161** Foundations of CS I (4)
- CS 162** Foundations of CS II (4)
- CS 260** Data Structures (4)
- CS 370** User Interface Design (3)
- MM 225** Introduction to Multimedia Development (3)
- MM 252** Intro Web Authoring (3)
- MM 315** Multimedia Design (3)
- CS 401** or **MM 401** Capstone (1-6)
- CS 407** or **MM 407** Seminar (1-6)

Computer Science concentration requires the following courses in addition to the core (25 credits)

- CS 221** C/C++ Programming (4)
- CS 248** Unix Programming (3)
- CS 318** Algorithm Analysis (4)
- CS 335** Networking and Network Administration (4)
- CS 344** Systems Analysis (3)
- CS 360** Object-Oriented Programming (4)
- CS 430** Database Management Systems (3)

Computer Science concentration requires the following related area requirements (15 credits)

- MATH 231** Discrete Math (4)
- MATH 251** Calculus I (4)
- MATH 252** Calculus II (4)

**MATH 261** Linear Algebra (3)  
Elective courses for the Computer Science track (choose from below) (4 credits)

- CS 301** Assembly Language Programming (3)
- CS 310** Special Topics (1-5)
- CS 314** Computer Architecture (3)
- CS 321** Computing Theory (3)
- CS 327** Compiler Design (3)
- CS 380** Software Engineering (4)
- CS 381** Programming Languages (4)
- CS 409** Practicum (1-12)
- CS 410** Special Topics (1-5)
- CS 427** Statistical & Scientific Computing (3)
- CS 428** Web Architecture and Programming (4)
- CS 440** Artificial Intelligence (4)

Total credits for B.S./B.A. Computer Science concentration (71-81 credits)

Multimedia concentration requires the following courses in addition to the core (9 credits)

- MM 319** Multimedia Programming (3)
- MM 327** Introduction to Computer Graphics Applications(3)
- MM 350** Multimedia Theory (3)

Multimedia concentration requires the following related area requirements (14 hours)

- ART 120** Design (3)
- ART 227** Graphics (3)
- MATH 112** Pre calculus (4)
- MATH 231** Discrete Math (4)

Elective courses required for the Multimedia concentration (choose from below) (21 credits)  
(May include a maximum of 15 cr. hours selected from CS electives list)

- ED 435** Educational Media (3)
- ENG 195** Introduction to Film (4)
- MM 352** Intermediate Web Authoring (3)
- MM 364** Digital Video Production (3)
- MM 366** Video Post-Production (3)
- MM 409** Practicum (1-12)
- MM 410** Selected Topics (1-5)
- MM 419** Advanced Multimedia Programming (3)
- MM 420** Multimedia Simulation (3)
- MM 452** Advanced Web Authoring (3)
- MM/ART 426** Individual Projects (1-4)
- MUS 340** Electronic Music II (2)
- POLS 330** Simulation Politics (5)
- WR 206** Applied Discourse Theory (3)
- WR 243** ScreenWriting Fundamentals (4)
- WR 320** Technical Writing (3)
- WR 330** The Electronic Word (3)

Total credits for B.S./B.A. Multimedia track (71-81 credits)

# TYPICAL FOUR YEAR CURRICULA FOR COMPUTER SCIENCE AND MULTIMEDIA STUDIES CONCENTRATIONS

*CS Concentration Option One: Student places into MATH 251*

## TYPICAL FIRST YEAR CURRICULUM

### Fall

**CS 121** Introduction to Software Development

**CS 161** Foundations of CS I

**MATH 251** Calculus I

General Education (3–6 credits)

### Winter

**CS 162** Foundations of CS II

**MATH 252** Calculus II

General Education (4–7 credits)

### Spring

**CS 260** Data Structures

**MATH 231** Discrete Math

**MM 225** Intro. MM Develop.

General Education (3–6 credits)

## TYPICAL SECOND YEAR CURRICULUM

### Fall

**CS 221** C/C++ Programming

**CS 248** UNIX Programming

**MATH 261** Linear Algebra

**MM 252** Intro Web Authoring

General Education (3–6 credits)

### Winter

**CS 311** Operating Systems

**CS 318** Algorithm Analysis

General Education (6–8 credits)

### Spring

**CS 370** Interface Design

**CS 335** Networking

General Education (9–12 credits)

## TYPICAL THIRD YEAR CURRICULUM

### Fall

**CS 344** Systems Analysis

**MM 315** Multimedia Design

General Education (6 credits)

Electives (3–6 credits)

### Winter

**CS 360** Object Oriented Prog.

General Education (6 credits)

Electives (3–6 credits)

### Spring

**CS 430** Database Mgmt

General Education (6 credits)

Electives (3–6 credits)

## TYPICAL FOURTH YEAR CURRICULUM

### Fall

**CS 401** Capstone

General Education (6 credits)

Electives (3–6 Credits)

### Winter

**CS/MM 407** Seminar

General Education (3–6 credits)

Electives (3–6 credits)

### Spring

General Education (3–6 credits)

Electives (6–9 credits)

*CS Concentration Option Two: Student places into MATH 111*

## TYPICAL FIRST YEAR CURRICULUM

### Fall

**CS 121** Introduction to Software Development

**MATH 111** Algebra

General Education (7–10 credits)

### Winter

**CS 161** Foundations of CS I

**MATH 112** Precalculus

General Education (4–7 credits)

### Spring

**CS 162** Foundations of CS II

**MATH 251** Calculus I

**MM 225** Intro. MM Develop.

General Education (3–5 credits)

## TYPICAL SECOND YEAR CURRICULUM

### Fall

**CS 221** C/C++ Programming

**CS 260** Data Structures

**MATH 252** Calculus II

### Winter

**CS 248** UNIX Programming

**CS 318** Algorithm Analysis

General Education (6–8 credits)

### Spring

**CS 311** Operating Systems

**CS 370** Interface Design

**CS 335** Networking

**MATH 231** Discrete Math

General Education (3–4 credits)

## TYPICAL THIRD YEAR CURRICULUM

### Fall

**CS 344** Systems Analysis  
**MM 315** Multimedia Design  
**MATH 261** Linear Algebra  
General Education (6 credits)

### Winter

**CS 360** Object Oriented Prog.  
General Education (6 credits)  
Electives (3–6 credits)

### Spring

**CS 430** Database Mgmt  
General Education (6 credits)  
Electives (3–6 credits)

## TYPICAL FOURTH YEAR CURRICULUM

Is the same as for Option One (above)

### *MM Concentration*

## TYPICAL FIRST YEAR CURRICULUM

### Fall

**CS 121** Introduction to Software Development  
**MM 225** Introduction to MM Develop  
**MATH 111** Algebra  
General Education (3–6 credits)

### Winter

**CS 161** Foundations of CS I  
**ART 227** Graphics  
**MATH 112** Precalculus  
General Education (3-6 credits)

### Spring

**CS 162** Foundations of CS II  
**MATH 231** Discrete Math  
**ART 120** Design  
General Education (4-6 credits)

## TYPICAL SECOND YEAR CURRICULUM

### Fall

**MM 252** Intro Web Authoring  
**MM 315** Multimedia Design  
**CS 260** Data Structures  
General Education (5-8 credits)

### Winter

**MM 327** Introduction to Computer Graphics  
Electives (3–6)  
**MM 319** MM Programming  
General Education (6-8 credits)

### Spring

**MM 319** MM Programming  
**CS 370** Interface Design  
Elective ( 3 credits)  
General Education (3-5 credits)

## TYPICAL THIRD YEAR CURRICULUM

### Fall

Electives (3-6 credits)  
General Education (6-12 credits)

### Winter

**MM 350** Multimedia Theory  
Electives (3–6) credits  
General Education (6-9 credits)

### Spring

Electives (6-9 credits)  
General Education (6-9 credits)

## TYPICAL FOURTH YEAR CURRICULUM

### Fall

**MM 401** Capstone  
MM Electives (3–6 credits)  
General Education (6-8 credits)

### Winter

**CS/MM 407** Seminar  
MM Electives (3–6 credits)  
General Education (3–6 credits)

### Spring

General Education (3–6 credits)  
Electives (6–9 credits)

## MINOR IN COMPUTER SCIENCE/MULTIMEDIA

These courses represent the fundamentals and a blend of broadness within the two areas of computer science and multimedia studies.

1. Required courses in CS/MM (30-33 credits)

**ART 227** Computer Graphics (3)  
**CS 121** Intro to Software Development (1)  
**CS 161** Foundations of Computer Science I (4)  
**CS 162** Foundations of Computer Science II (4)  
**CS 260** Data Structures (4)  
**MATH 231** Discrete Mathematics (4)  
**MM 225** Intro to Multimedia Development (3)  
**MM 252** Intro to Web Authoring (3)  
**MM 315** Multimedia Design (3)  
One upper division CS or MM elective (1-4)

2. A grade of "C-" or better in each course counting toward the minor.

3. A minimum of 10 credit hours counting towards the minor must be completed at EOU.

## COMPUTER SCIENCE/ MULTIMEDIA COURSE DESCRIPTIONS

### **CS 110 - CS 110 Credits: 1.00 to 6.00**

An in-depth presentation of a topic of interest to both students and faculty. Topics will vary from year to year depending on the interests and availability of faculty. Prerequisites: May be required for some topics.

### **CS 121 - Intro Software Development Credits: 1.00**

This survey course introduces computer software, the process of its development, and its uses in contemporary society. Topics include data representation, basic computer architecture, and categories of software including multimedia products, end-user applications, process-control, and scientific computing.

### **CS 140 - Microcomputer Syst\*L Credits: 3.00 Gen Ed-Language & Logic**

Emphasis is placed on the technical details of the microcomputer system as a whole in order to produce sophisticated users. This course focuses on microcomputer operating systems, their structures and relations to the microcomputer architecture, a technical understanding of information flow through the microcomputer and its hardware interfaces. This course also introduces the Internet, networking, and communications protocols such as TCP/IP.

### **CS 161 - Foundations Of CS I Credits: 4.00**

Includes structured programming, computer organization, social and ethical issues in computer science. Prerequisite: MATH 111

### **CS 161L - Found Of CS Lab I Credits: .00**

### **CS 162 - Foundations Of CS II Credits: 4.00**

Includes structured programming, computer organization, social and ethical issues in computer science. Prerequisites: CS 161, MATH 111

### **CS 162L - Found CS Lab II Credits: .00**

### **CS 209 - Field Placement Credits: 1.00 to 15.00**

### **CS 210 - Selected Topics: 1.00 to 6.00**

An in-depth presentation of a topic of interest to both students and faculty. Topics will vary from year to year depending on the interests and availability of faculty. Prerequisites: May be required for some topics

### **CS 221 - C/C++ Programming Credits: 4.00**

An introduction to the basics of programming as used in C and C++, including selection statements, loops, arrays, string handling, pointers, registers and

functions. Practical exercises will require the construction, compilation, debugging, and execution of complete programs that implement given algorithms to solve simple problems. The emphasis in this course will be on the common features of C and C++; however memory allocation and the use of pointers will be discussed in the context of the ANSI C implementation. Prerequisite: CS 162; and CS 260 (may be taken concurrently).

### **CS 244 - Systems Analysis Credits: 3.00**

Introduction to fundamental software engineering concepts for software development. Covers methodologies and tools, requirement analysis, design and implementation in an object-oriented or traditional structured functional software development process. Emphasis on life cycle documentation and software development standards.

### **CS 244L - Systems Analy Lab Credits: .00**

### **CS 248 - Unix Programming Credits: 3.00**

The essentials of UNIX tool programming will be covered with the use of high-level programming languages, utilities, and toolkits. Topics include UNIX shells and essential utilities and network security issues, and high-level networking and protocol basics. Provides students with an opportunity to team the tools and programming languages that will help them make the best use of UNIX. Prerequisite: CS 162 or Consent of Instructor.

### **CS 260 - Data Structures Credits: 4.00**

An introduction to various implementations of commonly used data structures and their applications. Topics include lists, stacks, queues, trees and hash tables. Prerequisite: CS 162.

### **CS 301 - Assembly Lang Programming Credits: 3.00**

Introduction to machine organization, machine structure, data representation, digital logic, and assembly language programming. Prerequisites: CS 162 or consent of instructor

Restrictions: May not be enrolled in one of the following Class(es): Freshman

### **CS 301L - Assembly Lang L Credits: .00**

### **CS 310 - Selected Topics Credits: 1.00 to 5.00**

An in-depth presentation of a topic of interest to both students and faculty. Topics will vary from year to year depending on the interests and availability of faculty. Prerequisite: May be required for some topics

Restrictions: May not be enrolled in one of the following Class(es): Freshman

### **CS 311 - Operating Systems Credits: 3.00**

The principles and problems involved in the development of a computer operating system. Overview of the development of operating systems, sequential and con-current processes, cooperation,

communication and mutual exclusion, synchronization constructs: monitors, conditional critical regions, semaphores; deadlocks, resource allocation, scheduling policies, storage management. Prerequisite: CS 248.

Restrictions: May not be enrolled in one of the following Class(es): Freshman

**CS 314 - Computer Architecture Credits: 3.00**

Hardware systems, computer architectures, and their interrelationships in advanced microcomputer systems. Parallel architectures, virtual memory architectures, and memory management strategies are discussed. Data representation, memory organization, input-output processing, stack computers, parallel computers, pipeline architecture, and microprogramming. Prerequisite: CS 301.

Restrictions: May not be enrolled in one of the following Class(es): Freshman

**CS 318 - Algorithm Analysis Credits: 4.00**

The analysis of variety of algorithms that arise frequently in computer applications. Basic principles and techniques for analyzing and improving algorithms in areas such as List Searches, Sorting, Pattern Recognition, Polynomial and Matrix Computations. Prerequisite: MATH 231 and CS 260

Restrictions: May not be enrolled in one of the following Class(es): Freshman

**CS 321 - Computing Theory Credits: 3.00**

Includes automata, complexity, Turing machines, unsolvable problems. Prerequisite: CS 318.

Restrictions: May not be enrolled in one of the following Class(es): Freshman

**CS 327 - Compiler Design Credits: 3.00**

The design and implementation of compiler and run-time systems for high-level languages, and the interaction among language design, compiler design, and run-time organization. Prerequisite: CS 321

Restrictions: May not be enrolled in one of the following Class(es): Freshman

**CS 335 - Networking/Network Admin Credits: 4.00**

An introductory examination of the Open System Interconnection Reference Model (OSI). Topics covered include network architecture, data flow control, transmission control, path control, recovery, and routing techniques. Prerequisite: CS 311

Restrictions: May not be enrolled in one of the following Class(es): Freshman

**CS 344 - Systems Analysis Credits: 3.00**

Introduction to fundamental software engineering concepts for software development. Covers methodologies and tools, requirement analysis, design and implementation in an object oriented or traditional structured functional software development process. Emphasis on life cycle documentation and software development standards. Prerequisite: MATH 261 and CS 162.

Division: Division Not Declared

Restrictions: May not be enrolled in one of the following Class(es): Freshman

**CS 360 - Object-Oriented Programming Credits: 4.00**

An introduction to the syntactic and execution characteristics of C/C++, including selection statements, loops, array, functions, and pointers. Construction, compilation, debugging, and execution of complete programs that implement given algorithms or solve simple problems. Previous programming experience is recommended. Prerequisite: CS 221, CS 260.

Restrictions: May not be enrolled in one of the following Class(es): Freshman

**CS 360L - Object Orient Prog Lab Credits: .00**

**CS 370 - User Interface Design Credits: 3.00**

Introduces principles of human-computer interface design and methodologies of implementation, evaluation, and research in human-computer interaction. Topics include user psychology, dialog styles, error handling and reporting, system response time, user documentation and help systems, and "intelligent" interfaces. Discusses techniques for the implementation and testing of human-computer interfaces. Prerequisite: MM 225.

Restrictions: May not be enrolled in one of the following Class(es): Freshman

**CS 380 - Software Engineering Credits: 4.00**

Emphasis is on the specification, organization, implementation, testing, and documentation of software. Inherent problems, challenges, tools, and methods of a large software project. Presents methods and tools used in the various stages of software production. This course should prepare students for the problems they will encounter as software professionals. Prerequisite: CS 344

Restrictions: May not be enrolled in one of the following Class(es): Freshman

**CS 381 - Programming Languages Credits: 4.00**

Concepts of high-level programming languages. Syntax and semantics of several existing languages. Compilers, interpreters and formal syntax specification. Prerequisite: CS 360.

Restrictions: May not be enrolled in one of the following Class(es): Freshman

**CS 401 - Capstone Credits: 1.00 to 6.00**

Prerequisite: Senior level or Consent of instructor

Restrictions: May not be enrolled in one of the following Class(es): Freshman, Sophomore

**CS 407 - Seminar Credits: 1.00 to 6.00**

Prerequisite: Junior or Senior standing.

Restrictions: May not be enrolled in one of the following Class(es): Freshman, Sophomore

**CS 409 - Practicum Credits: 1.00 to 12.00**

Students gain practical experience in a professional or pre-professional setting. Prerequisites: Upper-division standing and consent of instructor

Restrictions: May not be enrolled in one of the following Class(es): Freshman, Sophomore

**CS 410 - Selected Topics Credits: 1.00 to 5.00**

An in-depth presentation of a topic of interest to both students and faculty. Topics will vary from year to year depending on the interests and availability of faculty. Prerequisites: May be required for some topics.

Restrictions: May not be enrolled in one of the following Class(es): Freshman, Sophomore

**CS 427 - Stats/Scientific Cmpng Credits: 3.00**

Introduces tools and techniques for solving problems arising in the sciences and engineering, especially using ordinary and partial differential equations. Prerequisite: MATH 261, CS 221.

Restrictions: May not be enrolled in one of the following Class(es): Freshman, Sophomore

**CS 428 - Web Architecture/Programming Credits: 4.00**

This course will cover some of the emerging technologies in the area of dynamic Web page development and Web server programming, including DHTML, XML, and Java Server Pages. Prerequisite: CS 248, CS 335, and CS 370.

Restrictions: May not be enrolled in one of the following Class(es): Freshman, Sophomore

**CS 430 - Database Mgmt System Credits: 3.00**

Analysis, design, and implementation of data systems in relation to information transfer. Prerequisite: CS 318, CS 344.

Restrictions: May not be enrolled in one of the following Class(es): Freshman, Sophomore

**CS 440 - Artificial Intelligence Credits: 4.00**

Basic concepts of intelligent systems and artificial intelligence programming: representation, control, communication and perception, and neural networks. Prerequisite: MATH 261, CS 318 and upper division standing.

Restrictions: May not be enrolled in one of the following Class(es): Freshman, Sophomore

**Multimedia****MM 110 - Selected Topics Credits: 1.00 to 5.00**

Study of a principle or practice in computer-enhanced multimedia.

**MM 121 - Intro Software Development Credits: 1.00**

This survey course introduces computer software, the process of its development, and its uses in contemporary society. Topics include data representation, basic computer architecture, and categories of software including multimedia products, end-user applications, process-control, and scientific computing. (Cross listed as CS 121.)

**MM 210 - Selected Topics Credits: 1.00 to 5.00**

Study of a principle or practice in computer-enhanced multimedia.

**MM 225 - Intro Multimedia Development Credits: 3.00**

Introduces students to the capabilities of interactive multimedia and its uses in education, industry and entertainment. Students review the roles of various types of software applications and experiment with authoring tools to create one or more small projects.

**MM 252 - Intro Web Authoring Credits: 3.00**

Topics covered in this course include history of the Internet, Internet protocols, and HTML. Students will apply this knowledge to create web pages using HTML and simple web-authoring tools. Emphasis in this class is how basic web pages work and how to design pages that are effective and efficient.

**MM 310 - Selected Topics Credits: 1.00 to 5.00**

Advanced study of a principle or practice in computer-enhanced multimedia.

Restrictions: May not be enrolled in one of the following Class(es): Freshman

**MM 315 - Multimedia Design Credits: 3.00**

Covers the design process for multimedia products, including the development life cycle and basic interface design issues. Each student will design a significant multimedia product and use a typical authoring environment to create a working prototype. Prerequisites: ART 129 and MM 225

Restrictions: May not be enrolled in one of the following Class(es): Freshman

**MM 319 - Multimedia Programming Credits: 3.00**

Students learn to design databases and use authoring tools' built-in scripting languages to reduce the overhead for a multimedia product. Students will also apply the scripting language to accomplish other sophisticated effects. Prerequisites: CS 162, MM 315

Restrictions: May not be enrolled in one of the following Class(es): Freshman

**MM 327 - Intro to Cmptr Graphics Applic Credits: 3.00**

This course introduces basic principles important in using bitmap and vector graphics, including resolution, color depth, and file compression schemes. Students will use representative bitmap and vector graphics programs to complete projects that demonstrate the basic capabilities of this type of software. Prerequisite: ART 227 or ART 129.

Restrictions: May not be enrolled in one of the following Class(es): Freshman

**MM 350 - Multimedia Theory Credits: 3.00**

Study of selected principles from various disciplines underlying multimedia creation, expression, communication, and argumentation. Prerequisite: MM 225 and Junior standing.

Restrictions: May not be enrolled in one of the following Class(es): Freshman, Sophomore

**MM 352 - Intermed Web Authoring Credits: 3.00**

This is an intermediate level course in web site development using current web authoring tools. Topics covered include web site planning, design

concepts, use of authoring tool software, creation of interactive web elements, and web site organization. Emphasis will be placed on creating dynamic and interactive client-side web objects using the Dreamweaver authoring tool. Prerequisite: MM 252 or equivalent HTML knowledge.

Restrictions: May not be enrolled in one of the following Class(es): Freshman

**MM 360 - 3-D Graphics & Animation Credits: 3.00**

Introduces the use of three dimensional computer modeling tools for the creation of still and moving images. Topics include spline editing, virtual lighting and rendering. Prerequisite: MM 327 and Junior standing.

Restrictions: May not be enrolled in one of the following Class(es): Freshman

**MM 362 - Digital Audio Production Credits: 3.00**

This is a course in the principles and practices of modern digital audio recording and production. This course is designed to benefit students that have audio interests for musical, theatre, multimedia, film and other applications. Prerequisite: CS 140 or equivalent. MUS 101 or 140 recommended.

Restrictions: May not be enrolled in one of the following Class(es): Freshman

**MM 364 - Digital Video Prod Credits: 3.00**

Covers storyboarding, video production and assembly of video using digital editing tools. Topics include lighting and use of camera angles and movements. Students will create complete productions appropriate for use in multimedia products. Prerequisite: WR 243 or ENGL 195.

Restrictions: May not be enrolled in one of the following Class(es): Freshman

**MM 366 - Video Post-Production Credits: 4.00**

Covers the editing of video using digital video editing and special effects tools. Students will continue the series of MM 362 and 364 with the goal of making a 12 minute digital video. Prerequisite: MM 364.

Restrictions: May not be enrolled in one of the following Class(es): Freshman

**MM 401 - Capstone Credits: 1.00 to 6.00**

Prerequisite: Senior level or Consent of instructor

Restrictions: May not be enrolled in one of the following Class(es): Freshman, Sophomore

**MM 405 - Reading & Conference Credits: 1.00 to 4.00**

Opportunity for advanced students to design and complete a multimedia project. Prerequisite: Completion of 90 hours of coursework, consent of instructor, and a clear statement of a proposed project.

Restrictions: May not be enrolled in one of the following Class(es): Freshman, Sophomore

**MM 407 - Seminar Credits: 1.00 to 6.00**

Restrictions: May not be enrolled in one of the following Class(es): Freshman, Sophomore

**MM 409 - Practicum Credits: 1.00 to 12.00**

Students gain practical experience in a professional or pre-professional setting. Prerequisite: Upper-division standing and Consent of instructor

Restrictions: May not be enrolled in one of the following Class(es): Freshman, Sophomore

**MM 410 - Selected Topics Credits: 1.00 to 5.00**

Advanced study of a principle or practice in computer-enhanced multimedia.

Restrictions: May not be enrolled in one of the following Class(es): Freshman, Sophomore

**MM 419 - Adv Multimedia Programming Credits: 3.00**

This course expands student knowledge of the use of software design and the scripting tools that are built in to authoring environments for the development of sophisticated multimedia products for education, entertainment, and business. Prerequisite: MM 319 and Junior standing.

Restrictions: May not be enrolled in one of the following Class(es): Freshman, Sophomore

**MM 420 - Multimedia Simulation Credits: 3.00**

This course introduces the use of multimedia authoring tools to create simulations for education and entertainment. Students will examine various general approaches to simulating situations and virtual environments. Prerequisite: MM 319 and Junior standing.

Restrictions: May not be enrolled in one of the following Class(es): Freshman, Sophomore

**MM 426 - Ind Proj In Multimedia Credits: 1.00 to 4.00**

Provides opportunity for the student to acquire additional depth and personal achievement in any multimedia area beyond what is supplied by usual course offerings.

Restrictions: May not be enrolled in one of the following Class(es): Freshman, Sophomore

**MM 452 - Advanced Web Authoring Credits: 3.00**

This course covers the use of advanced tools for web site production. Topics will include java applets, forms, common gateway interfaces, and other state-of-the-art methods. Precise content will vary as technology advances. Prerequisites: CS 162, MM 252 and Junior standing.

Restrictions: May not be enrolled in one of the following Class(es): Freshman, Sophomore