

CIS 488/588 Sections 001/002

Game Design and Implementation 2

3 Credit Hours, Winter 2023

6:00-8:45 W, 2380/2382 ELB, Recitation and On-line

Contact Information:

- Professor Bruce R. Maxim
 - Office Hours: M 2-3 W 4-6 Th 3-5 and by appt.
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Course Description:

This course is a continuation of the material studied in CIS 487/587. The focus of the course will be hands-on development of computer games and computer game development tools (e.g. game engines). Students will study a variety of software technologies relevant to computer game design, including: 3D graphics, computer animation, data-driven game design, multiplayer game programming, and game AI. Lecture topics will be taken from several areas of computer science: simulation and modeling, computer graphics, artificial intelligence, game theory, software engineering, human computer interaction, and game content development.

Graduate students will be normally expected to work as individuals to complete their game projects. Undergraduate students will be required to work on project teams.

Dearborn Discovery Core Category and Goals:

- None

Program Learning Goals:

- Our graduates will be successfully employed in a computer and information science-related field or another career path, in an industrial, commercial, academic, governmental, or non-governmental organization, or will be a successful graduate student in a program preparing them for such employment
- Our graduates will lead and participate in culturally diverse teams, becoming global collaborators and adapting to an ever changing field
- Our graduates will continue their professional development by obtaining continuing education credits, professional registration or certifications, or post-graduate study credits or degrees

Course Objectives:

a. Outcomes of instruction

- The student will be able to design a 3D multimedia computer game and create design documents for it
- The student will be able to design an original game using an intelligent opponent of the student's own design
- The student will be able to design an original game using an intelligent opponent of the student's own design
- The student will be able to design trade-offs considered in formulating the software architecture design for an original 3D game
- The student will be able to develop the requirements for a 3D multimedia computer game
- The student will be able to develop the requirements for an intelligent computer opponent for a computer game

b. Student outcomes assessed in the course

- Outcome 2 – An ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors
- Outcome 5 – Function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives.

Required Materials and/or Technology:

REQUIRED: The Art of Game Design: A Book of Lenses, J. Schell, CRC Press, 2019.

RECOMMENDED: Unreal Engine 4, A. Sanders, CRC Press, 2016.

URL: <http://www-personal.umd.umich.edu/~bmaxim/>
<http://groups.umd.umich.edu/cis/course.des/cis488.html>
<http://groups.umd.umich.edu/cis/course.des/cis588.html>

Assignments and Grading Distributions:

6 Project Assignments (Written and Oral)	30%
Lens Presentations and Peer Reviews	20%
Final Reports	20%
3 Working Game Prototypes	20%
8 Activity Modules	10%

97-100%	A+	83-86%	B	70-72%	C-
93-96%	A	80-82%	B-	67-69%	D+
90-92%	A-	77-79%	C+	63-66%	D
87-89%	B+	73-76%	C	60-62%	D-

Tentative Course Outline and Schedule:

Date	Activity and Content
Module 1 Jan 11	Role Play Begins Intro to Unreal 4 (UR1-UR2)
Jan 18	Game Pitch Presentations – online Unreal Level Editing (UR3-UR4)
Module 2 Jan 25	Teams Formed – Brainstorming Game Studio Process Model Definition Blueprints and Reactive Elements (UR5)
Feb 01	Cubicorn Games – Consultants One Page Presentations - Lens Topics Selections Due Studio Process Definition Model - approval
Feb 08	Game Treatment Presentations and Market Analysis Materials, Lighting, Terrain (UR6-UR7,UR12)
Module 3 Feb 15	Elevator Pitches Lens Presentations Matinee and Bot Navigation (UR8)
Module 4 Feb 22	Two Pitch Swaps - Contracts Lens Presentations Unreal Scripting and AI (UR11)
Feb 25-Mar 05	Spring Break
Mar 08	Alpha Prototype Review Play Testing – in 2046 ELB or online
Module 5 Mar 15	Alpha Retrospective and Beta Planning Lens Presentations Karma Actors, Weapons, Characters (UR9)
Module 6 Mar 22	Secure Coding Lens Presentations User Interfaces, Particle Effects (UR10)

Mar 29	Beta Prototype Review Play Testing – in 2046 ELB or online
Module 7 Apr 05	Sequels – Accessible Game Design Len Presentations
Module 8 April 12	Creating Game Trailers Lens Presentations
April 19	Study day – not formal class 3D Game Marketing Presentation Due and Postmortems
April 26	Gold Release Candidate Review 6:30-9:30 Play Testing – in 2046 ELB or online

Instructor or Course Specific Policies:

The Faculty of the University of Michigan - Dearborn, College of Engineering and Computer Science (CECS) believe that our students are honorable, ethical, trustworthy people. Students who engage in cheating of any kind, place the academic integrity and reputation of our university and our college in jeopardy.

To ensure that all CECS students receive an equitable education and are prepared for the workforce, the [University of Michigan - Dearborn Academic Code of Conduct](#) will be strictly enforced in all CECS courses. All CECS students are required to read, understand, and follow the Academic Code of Conduct, as well as any additional rules that the course instructor provides. Students who violate the Academic Code of Conduct or course rules, are subject to all penalties indicated, including failing the course, potential loss of scholarship funds or expulsion from the university.

Cheating includes, but is not limited to:

- Receiving assistance of any kind, on any individual, graded assignment or exam
- Providing assistance of any kind, on an individual, graded assignment or exam
- Using materials that are prohibited on any graded assignment or exam
- Test/Exam Parties - i.e., completing an individual exam as a group project
- Collusion/Deception of any kind, including but not limited to:
 - coordinating with others to obtain or distribute prohibited or unpublished materials
 - giving false information to receive time extensions or re-takes
 - obtaining and using previous exams not provided by the instructor
- Using a mobile device (including smart watches) to communicate with others during an exam
- Paying another person to complete coursework, including exams
- Receiving payment to complete another student's work, including exams

- Requesting and using help from Chegg, Course Hero or any other such service
- Submitting examination information to Chegg, Course Hero or any other such service
- Plagiarism - using another person's work without properly citing
- Storing equations or solutions in a calculator to use on a quiz or exam when not permitted
- Screenshots of Canvas quizzes or exams
- Any "hacks" used to access Canvas content or other materials before released
- Any other dishonest action that violates course rules and/or the Academic Code of Conduct

If you are questioning an action you are about to take and cannot reach your instructor to verify, it is likely that you should not proceed with that action. Oral exams may be given to determine if a student understands the course material.

Library Resources

The library's here to help! Go to the Mardigian Library website at library.umd.umich.edu for information about accessing research help, accessing the library's [online databases](#), [journal articles](#), and [books/ebooks](#), and checking out physical items from the library. Research librarians will be available to help you with your research needs through [live chat, text, email, and virtual appointments](#), as well as in the library for walk-in help. Check-out for [books](#), [course reserves](#), and [loanable technology \(such as Chromebooks\)](#) is also available at the Library Info Desk, and our four floors are open for individual study and group work. Feel free to ask the Mardigian any of your questions at library.umd.umich.edu/ask.

Food Pantry

The pantry exists to support individuals on their journey as they work toward achieving their goals. We are committed to increasing access to food as a key to success, by assisting any student in need! If you need access or have questions, please contact the Office of Student Life by phone at 313-593-5390, by email at umdearbornpantry@umich.edu.

Vaccination & Face Covering Policy

In order to protect our classes, campus, and community from COVID-19 infections, please review Dearborn's [COVID Response website](#) for the latest policies regarding vaccination requirements and optional masking on campus.

University-Wide Policies or Statements Relevant to Courses:

Please see the 'Course Policies' Menu on Canvas for information on the following topics. To find the 'Course Policies' Menu on Canvas, log into any course in Canvas, and then on the blue ribbon on the far left scroll down to 'Course Policies' and click on it. This opens a white ribbon with individual links to UM-Dearborn websites on the following topics:

- University Attendance Policy
- Academic Integrity Policy
- Counseling
- Disability and Accessibility Services
- Safety Statement
- Harassment, Sexual Violence, Bias, and Discrimination