

Certificate: Game Design

The purpose of the certificate program in game design is to provide interested students with the theoretical knowledge and practical experience needed to program computer games at the professional level. The core courses included in this program are taught from a software engineering perspective and also include game programming techniques. The elective courses are intended to allow students to strengthen their software engineering backgrounds and to explore advanced areas of computer science important to game programmers. (12 credit hours)

Certificate offered on Campus and via Distance Learning

Required Courses (6 credits)

CIS 587 Computer Game Design

3 credits

This course deals with the study of the technology, science and art in the creation of computer games. The focus of the course will be hands-on development of computer games. Students will study a variety of software technologies relevant to computer game design including programming languages, scripting languages, operating systems, file systems, networks, simulation engines, and multi-media design systems. Lecture topics will be taken from several areas of computer science: simulation and modeling, computer graphics, artificial intelligence, real-time processing, game theory, software engineering, human computer interaction, graphic design and game aesthetics.

CIS 588 Computer Game Design and Implementation II

3 credits

This course is a continuation of the material studied in CIS 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: data-driven game design, multiplayer game programming, game AI, game theory, game content development, and game aesthetics.

Complete 2 courses from the following (6 credits):

CIS 515 Computer Graphics

3 credits

Basic geometrical concepts: graphics output primitives, two-dimensional transformations, windowing and clipping, three-dimensional viewing, visible surface detection methods, and graphical user interfaces.

CIS 552 Computer Animation

3 credits

This course covers the fundamentals of computer animation, animation systems and animation hardware. Applications, car crashes, robot motion, and manufacturing systems will be simulated and virtual reality will be introduced.

CIS 553 Software Engineering

3 credits

This course covers program design methodologies; control flow and data flow in program; program measurement, software life cycle; large program design, development, testing, and maintenance. In addition, software reliability, fault tolerance, and evolution dynamics of software are also discussed.

CIS 577 Software User Interface Design and Analysis

3 credits

Current theory and design techniques concerning how user interfaces for computer systems should be designed to be easy to learn and use. Focus on cognitive factors, such as the amount of learning required, and the information-processing load imposed on the user. Emphasis will be on integrating multimedia into the user interface.

CIS 579 Artificial Intelligence

3 credits

This course introduces students to basic concepts and methods of artificial intelligence from a computer science perspective. Emphasis of the course will be on the selection of data representations and algorithms useful in the design and implementation of intelligent systems. The course will contain an overview of one AI language and some discussion of important applications of artificial intelligence methodology.

ECE 5251 Multimedia Design Tools I

3 credits

This course will introduce students to multimedia design tools. Basic concepts of digital images will be reviewed, such as resolution and color theory. Various methods of image editing and enhancement will be covered including masks, gradients, filters and image compositing. The basic concepts of vector graphics will be introduced, including Bezier curves, groups, and symbols. Also, basic concepts in fonts and print media will be discussed. Basic design principles will be utilized through the course, such as grid schemes, layout, and color mixing. Part of the coursework involves a project of communicating technical information.