

Academic Org: Dept of Computer Sci & Engg – Subject: Computer Science

**Course:** CSCI4120      **Course ID:** 002610      **Eff Date:** 2022-07-01      **Crse Status:** Active      **Apprv. Status:** Approved      **【Course Rev】**  
Principles of Computer Game Software 電腦遊戲軟件原理

This course aims at establishing the principles, techniques and tools in the design and development of computer game software with focus on the real time performance consideration. Topics include: stages in computer game development, concept of game engine, rendering considerations, physics effects, artificial intelligence (AI), audio effects, scripting and environment for game project development.

本科旨在探討電腦遊戲軟件及相關工具開發的原理及技術，並集中討論實時技術考慮。課題包括：開發的各個階段，遊戲引擎概念，繪圖考慮，物理效應，人工智能，聲效，劇本監控 / 編導程序及遊戲方案規劃。

**Grade Descriptor:**      A

EXCELLENT – exceptionally good performance and far exceeding expectation in all or most of the course learning outcomes; demonstration of superior understanding of the subject matter, the ability to analyze problems and apply extensive knowledge, and skillful use of concepts and materials to derive proper solutions.

有關等級說明的資料，請參閱英文版本。

B

GOOD – good performance in all course learning outcomes and exceeding expectation in some of them; demonstration of good understanding of the subject matter and the ability to use proper concepts and materials to solve most of the problems encountered.

有關等級說明的資料，請參閱英文版本。

C

FAIR – adequate performance and meeting expectation in all course learning outcomes; demonstration of adequate understanding of the subject matter and the ability to solve simple problems.

有關等級說明的資料，請參閱英文版本。

D

MARGINAL – performance barely meets the expectation in the essential course learning outcomes; demonstration of partial understanding of the subject matter and the ability to solve simple problems.

有關等級說明的資料，請參閱英文版本。

F

FAILURE – performance does not meet the expectation in the essential course learning outcomes; demonstration of serious deficiencies and the need to retake the course.

有關等級說明的資料，請參閱英文版本。

**Equivalent Offering:**

**Units:** 3 (Min) / 3 (Max) / 3 (Acad Progress)

**Grading Basis:** Graded

**Repeat for Credit:** N

**Multiple Enroll:** N

**Course Attributes:**

**Topics:**

### COURSE OUTCOMES

**Learning Outcomes:**

1. able to implement simple walkthrough programs
2. able to write simple shader program for GPU
3. able to use a game engine to build a complete computer game software
4. able to incorporate various game design principles in the final product

**Course Syllabus:**

This course aims at establishing the principles, techniques and tools in the design and development of computer game software with focus on the real time performance consideration. Topics include: stages in computer game development, concept of game engine, rendering considerations, physics effects, artificial intelligence (AI), audio effects, scripting and environment for game project development.

**Assessment Type:**

Essay test or exam : 40%  
Others : 60%

**Feedback for Evaluation:**

1. Course evaluation questionnaire
2. Results of game demo building projects
3. Results of the examinations

**Required Readings:**

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**Recommended Readings:**

1. Daniel S. Dalmau "Core Techniques and Algorithms in Game Programming", New Riders Publishing 2004.
2. Alan Watt & Fabio Policarpo "3D Games Real-time Rendering and Software Technology Vol. 1", Addison-Wesley 2001.
3. Andrew Rollings & Ernest Adams "Andrew Rollings & Ernest Adams on Game Design", New Riders Publishing 2003.
4. Richard A. Bartle "Designing Virtual Worlds", New riders Publishing 2004.

**OFFERINGS**

1. CSCI4120 Acad Organization=CSD; Acad Career=UG

**COMPONENTS**

LEC : Size=30; Final Exam=Y; Contact=3  
TUT : Size=30; Final Exam=N; Contact=1

**ENROLMENT REQUIREMENTS**

1. CSCI4120 **Enrollment Requirement Group:**  
1. Prerequisite: CSCI2100 or 2520 or ESTR2102;  
2. Prerequisite/Corequisite: CSCI3260 or 3550.

**New Enrollment Requirement(s):**  
Pre-requisite = no change  
Co-requisite = no change

**CAF**

eLearning hrs for blended cls 0  
No. of micro-modules 0  
Research components (UG) 50%-74%

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