

**STATE UNIVERSITY OF NEW YORK
COLLEGE OF TECHNOLOGY
CANTON, NEW YORK**



MASTER SYLLABUS

GAME 240 3D Graphics for Game Development

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**CANINO SCHOOL OF ENGINEERING TECHNOLOGY
DECISION SYSTEMS
FALL 2018**

- A. **TITLE:** 3D Graphics for Game Development
- B. **COURSE NUMBER:** GAME 240
- C. **CREDIT HOURS:** (Hours of Lecture, Laboratory, Recitation, Tutorial, Activity)

Credit Hours: 3
 # Lecture Hours: 2 per week%
 # Lab Hours: per week
 Other: (1) two-hour recitation per week

Course Length: 15 Weeks

D. **WRITING INTENSIVE COURSE:** No

E. **GER CATEGORY:**

F. **SEMESTER(S) OFFERED:** Spring

G. **COURSE DESCRIPTION:**

Students gain knowledge and hands-on skills of 3D graphics, and they also learn the rigors of an object-oriented language used in common game design and development.

H. **PRE-REQUISITES/CO-REQUISITES:**

- a. Pre-requisite(s): GAME 210
- b. Co-requisite(s):
- c. Pre- or co-requisite(s):

I. **STUDENT LEARNING OUTCOMES:**

II. <u>Course Student Learning Outcome</u> <u>[SLO]</u>	<u>PSLO</u>	<u>GER</u>	<u>ISLO</u>
a. Develop game projects using professional gaming software.	PSLO 8 Demonstrate an understanding of recent principles of game design, including, programming, narrative, character and level design.		5
b. Demonstrate proper design process procedures.	PSLO 6 Use the design process: Concept, Design, Prototype, Production, Testing and Revision to evaluate, and implement strategies to find a solution to a problem.		5
c. Demonstrate proper testing and troubleshooting techniques.	PSLO 4 Recognize the underlying principles guiding the relevant visual, audio, interactive, and narrative aesthetics of an animation or a game		2 [IA]
d. Examine current trends in game design	PSLO 5 Synthesize trends, theories, movements and advancements in technology in the development of new ideas.		2 [IA]
e. Apply gaming principles of narrative, dynamics and mechanics to a final project.	PSLO 8 Demonstrate an understanding of recent principles of game design, including, programming, narrative, character and level design.		5

KEY	<u>Institutional Student Learning Outcomes [ISLO 1 – 5]</u>
ISLO #	ISLO & Subsets
1	Communication Skills Oral [O], Written [W]
2	Critical Thinking <i>Critical Analysis [CA] , Inquiry & Analysis [IA] , Problem Solving [PS]</i>
3	Foundational Skills <i>Information Management [IM], Quantitative Lit./Reasoning [QTR]</i>
4	Social Responsibility <i>Ethical Reasoning [ER], Global Learning [GL], Intercultural Knowledge [IK], Teamwork [T]</i>
5	Industry, Professional, Discipline Specific Knowledge and Skills

J. APPLIED LEARNING COMPONENT: Yes x No

K. % TEXTS:
3D Graphics for Game Programming by JungHyun Han (Author). Publisher: Chapman and Hall/CRC (25 Feb. 2011). ISBN-10: 1439827370 ISBN-13: 978-1439827376

L. % REFERENCES:
Mathematics for 3D Game Programming and Computer Graphics by Eric Lengyel (Author). Publisher: Delmar Cengage Learning; 3rd Revised edition (22 Jun. 2011). ISBN-10: 1435458869, ISBN-13: 978-1435458864.

Introduction to 3D Game Programming with DirectX12 (Computer Science) by Frank D. Luna (Author). Publisher: Mercury Learning & Information; Pap/DVD edition (28 Mar. 2016). ISBN-10: 1942270062, ISBN-13: 978-1942270065

M. % EQUIPMENT:
 PC Computer Lab with Microsoft Office, Unity, Visual Studio, and NVidia graphics hardware installed.

N. % GRADING METHOD: A-F

O. % SUGGESTED MEASUREMENT CRITERIA/METHODS:

- Assignments
- Projects
- Quizzes
- Exams
- Participation

P. DETAILED COURSE OUTLINE:

1. ! Introduction
 - a. ! Introduction to the high-level overview of 3D graphics and virtual reality, as well as their relationship to modern gaming design and development
 - b. ! Introduction to the Computer Lab as well as related computer graphics hardware equipment
 - c. ! Syllabus
2. ! 3D texturing and lighting
3. ! Visualization and virtual reality
4. ! Review of Autodesk Maya software
5. ! Vertex processing
 - a. ! Collision Detection
6. ! Rasterization
7. ! Fragment Processing and output merging
 - a. ! Physics Engines
8. ! Illumination and shading
 - a. ! Modeling
 - b. ! Transformations
9. ! Parametric curves and surfaces
10. Shader models
11. Image texturing
12. Bump mapping
13. Advanced texturing
14. Physics-based simulation
15. Case study
16. Final Project Presentations

Q. LABORATORY OUTLINE:

None