CS 77.11 Course Outline as of Fall 2024

CATALOG INFORMATION

Dept and Nbr: CS 77.11 Title: VIRTUAL PRODUCTION
Full Title: Introduction to Virtual Production
Last Reviewed: 2/12/2024

Units		Course Hours per Week		Nbr of Weeks	Course Hours Total	
Maximum	3.00	Lecture Scheduled	3.00	17.5	Lecture Scheduled	52.50
Minimum	3.00	Lab Scheduled	0	8	Lab Scheduled	0
		Contact DHR	0		Contact DHR	0
		Contact Total	3.00		Contact Total	52.50
		Non-contact DHR	0		Non-contact DHR	0

Total Out of Class Hours: 105.00 Total Student Learning Hours: 157.50

Title 5 Category:	AA Degree Applicable
Grading:	Grade or P/NP
Repeatability:	00 - Two Repeats if Grade was D, F, NC, or NP
Also Listed As:	
Formerly:	

Catalog Description:
Students will learn the technical and visual aspects of three-dimensional virtual production for digital video and film. Topics will include all stages of virtual production, including pre-production, storyboards, blocking, lighting, sets, and props. Students will gain knowledge and technical skills, including real-time three-dimensional visualization using game engines, motion capture, workflows, camera functions and movement, industry terminology, as well as learn about crew duties and responsibilities.

Prerequisites/Corequisites:

Recommended Preparation:
Completion of CS 42 and APTECH 43 recommended, or prior experience with 3D modelling and game engines.

Limits on Enrollment:

Schedule of Classes Information:
Description: Students will learn the technical and visual aspects of three-dimensional virtual production for digital video and film. Topics will include all stages of virtual production,

including pre-production, storyboards, blocking, lighting, sets, and props. Students will gain knowledge and technical skills, including real-time three-dimensional visualization using game engines, motion capture, workflows, camera functions and movement, industry terminology, as well as learn about crew duties and responsibilities. (Grade or P/NP)
Prerequisites/Corequisites:
Recommended: Completion of CS 42 and APTECH 43 recommended, or prior experience with 3D modelling and game engines.
Limits on Enrollment:
Transfer Credit: CSU;
Repeatability: Two Repeats if Grade was D, F, NC, or NP

ARTICULATION, MAJOR, and CERTIFICATION INFORMATION:

AS Degree:	**Area**			Effective:	Inactive:
CSU GE:	**Transfer Area**			Effective:	Inactive:
IGETC:	**Transfer Area**			Effective:	Inactive:
CSU Transfer:	Transferable	Effective:	Fall 2023	Inactive:	
UC Transfer:		Effective:		Inactive:	

CID:

Certificate/Major Applicable:
Certificate Applicable Course

COURSE CONTENT

Student Learning Outcomes:
At the conclusion of this course, the student should be able to:
1. Design and create a virtual production project from concept to final product.
2. Collaborate effectively with production team.
3. Adapt professional skills to most current virtual production technology industry standards.

Objectives:
At the conclusion of this course, the student should be able to:
1. Develop and implement virtual production, three-dimensional, and visual storytelling aesthetics.
2. Develop and implement virtual production content development.
3. Develop a functioning virtual production prototype.
4. Explain software technologies including virtual production platforms, stagecraft, virtual production sets, and environments.

Topics and Scope:

I. Introduction
   A. History and origins of the real-time revolution
   B. A working definition of virtual production
II. Virtual Production Features and Benefits
   A. Key features of virtual production

B. Benefits of virtual production by work area
III. Approaches to Virtual Production
A. Types of virtual production
B. Collaboration and team roles
IV. Real-time Content Engine Virtual Production Basics
A. Software tools used in virtual production
B. Working with game engines: setup and workflow
V. Pre-visualization
A. Designing the scene
B. Pre-visualizing scene in game engine
C. World building and storytelling
D. Location, props, and costumes
VI. Pre-production
A. Planning the scene
B. Developing a greybox prototype of a scene
C. Building a three-dimensional set and environment
D. Storyboards
E. Blocking and mapping
F. Staging
G. Creating a design document
H. Creating a project outline and flowchart
VII. Motion Capture
A. Body motion capture and tracking
B. Facial expression capture and tracking
VIII. Stagecraft
A. Video walls
B. Green screen and chroma key technologies
C. Related on-set technologies
D. Animating and recording scenes
IX. Cinematography
A. Designing shots and shot lists
B. Shooting scene on set
C. Crew roles and staffing for on-set shooting
X. Lighting
A. Virtual lighting in game engines
B. On-set lighting for performance
XI. Sound
A. Virtual sound design and considerations
B. On-set sound design and considerations
XII. Post-production - Production of final frames
XIII. The Future of Virtual Production in Film and Video

Assignment:

1. Read about virtual production theory and application (approximately 20-30 pages per week)
2. View and critique third-party virtual production content
3. Preparations for virtual production, including software setup, recording, and playback
4. Create a design document for project(s) (1-2)
5. Create an outline and flow chart for project(s) (1-2)
6. Compose and light scene(s) in game engine (1-2)
7. Pre-visualize scene(s) in game engine (1-2)
8. Build greybox scene prototypes(s) in game engine (1-2)

9. Map and block scene(s) including shots and shot lists (1-2)
10. Plan and conduct motion and face capture
11. Shoot scene(s) including on-set props, audio, and costumes (1-2)
12. Presentation of virtual production project(s) (1-2)
13. Critique of in-class project(s) (1-2)
14. Exam(s) including a midterm and/or final exam (1-2)

Methods of Evaluation/Basis of Grade:

Writing: Assessment tools that demonstrate writing skills and/or require students to select, organize and explain ideas in writing.

Design document(s); critique(s) of third-party content; critique(s) of in-class projects and collaboration	Writing 10 - 30%

Problem Solving: Assessment tools, other than exams, that demonstrate competence in computational or non-computational problem solving skills.

Outline(s) and flow chart(s); shot list(s)	Problem solving 20 - 40%

Skill Demonstrations: All skill-based and physical demonstrations used for assessment purposes including skill performance exams.

Preparations for virtual production; composition and lighting of scene(s); pre-visualization of scene(s); greybox prototype(s); motion and face capture; shooting of scene(s)	Skill Demonstrations 25 - 55%

Exams: All forms of formal testing, other than skill performance exams.

Midterm and/or final exam	Exams 10 - 30%

Other: Includes any assessment tools that do not logically fit into the above categories.

Presentation of virtual production project(s)	Other Category 5 - 10%

Representative Textbooks and Materials:
Unreal Engine 4 Virtual Reality Projects: Build immersive, real-world VR applications using UE4, C++, and Unreal Blueprints. Mack, Kevin and Ruud, Robert. Packt Publishing. 2019 (classic)
Filming the Fantastic with Virtual Technology: Filmmaking on the Digital Backlot. Sawicki, Mark and Moody, Juniko. Routledge. 2020
Master Shots Vol 3: The Director's Vision: 100 Setups, Scenes and Moves for Your Breakthrough Movie. Kenworthy, Christopher. Michael Wiese Productions. 2013 (classic)
Instructor prepared material