

## LANEY COLLEGE COURSE OUTLINE

<b>COLLEGE:</b>		<b>STATE APPROVAL DATE:</b>	04/05/2018
<b>ORIGINATOR:</b>	Koina Freeman	<b>STATE CONTROL NUMBER:</b>	CCC00059 1966
		<b>BOARD OF TRUSTEES APPROVAL DATE:</b>	03/27/2018
		<b>CURRICULUM COMMITTEE APPROVAL DATE:</b>	02/09/2018
		<b>CURRENT EFFECTIVE DATE:</b>	08/20/2018

### DIVISION/DEPARTMENT:

#### 1. REQUESTED CREDIT CLASSIFICATION:

Credit - Degree Applicable  
Course is not a basic skills course.  
Program Applicable

#### 2. DEPT/COURSE NO:

MEDIA 070

#### 3. COURSE TITLE:

XR Design: Creating Virtual Reality

#### 4. COURSE: Laney New Course

**TOP NO.** 0699.00

#### 5. UNITS: 3.000

**HRS/WK LEC:** 2.00 Total: 35.00

**HRS/WK LAB:** 3.00 Total: 52.50

**HRS/WK TBA:**

#### 6. NO. OF TIMES OFFERED AS SELETED TOPIC: AVERAGE ENROLLMENT:

#### 7. JUSTIFICATION FOR COURSE:

This field is growing exponentially, as shown by the many unfilled jobs seen daily in the job ads. Together with the storytelling skills gained in the many MEDIA department courses at Laney College, this AR and VR course will equip students with entry level skills to extremely high paying internships in the industry.

#### 8. COURSE/CATALOG DESCRIPTION

Principles of AR and VR Immersive Design for Mobile, Web, and Head Mounted Displays: Analysis and application of concepts of Augmented and Virtual Reality; design, flowcharts, storyboards, story scripts, storytelling, branching narratives; 360 cameras; software and hardware.

#### 9. OTHER CATALOG INFORMATION

a. Modular: No If yes, how many modules:

b. Open entry/open exit: No

c. Grading Policy: Both Letter Grade or Pass/No Pass

d. Eligible for credit by Exam: No

e. Repeatable according to state guidelines: No

f. Required for degree/certificate (specify):

Video Production For Video, Broadcast And Digital Cinematography, Video Production for Video, Broadcast and Digital Cinematography

g. Meets GE/Transfer requirements (specify):

acceptable for credit CSU/UC

h. C-ID Number: Expiration Date:

i. Are there prerequisites/corequisites/recommended preparation for this course? No

#### 10. LIST STUDENT PERFORMANCE OBJECTIVES (EXIT SKILLS): (Objectives must define the exit skills required of students and include criteria identified in Items 12, 14, and 15 - critical thinking, essay writing, problem solving, written/verbal communications, computational skills, working with others, workplace needs, SCANS competencies, all aspects of the industry, etc.)(See SCANS/All Aspects of Industry Worksheet.)

Students will be able to:

1. Implement AR/VR content development
2. Explain VR and AR theory, VR presence, VR tracking
3. Implement core concepts of AR/VR storytelling
4. Develop and implement AR/VR aesthetics
5. Develop a functioning AR/VR prototype
6. Explain software technologies including VR and AR platforms, VR Cinema, VR Journalism, VR/AR Entertainment, VR/AR Environments

**11A. COURSE CONTENT:** List major topics to be covered. This section must be more than listing chapter headings from a textbook. Outline the course content, including essential topics, major subdivisions, and supporting details. It should include enough information so that a faculty member from any institution will have a clear understanding of the material taught in the course and the approximate length of time devoted to each. There should be congruence among the catalog description, lecture and/or lab content, student performance objectives, and the student learning outcomes. List percent of time spent on each topic; ensure percentages total 100%.

**LECTURE CONTENT:**

**1. Gamification & AR/VR/XR Overview**

- Unity layout and navigation
- The Inspector Panel and its components
- Unity Tools & Resources (i.e.; Asset store)
- Introduce Course resources: VR Headsets, AR Phones, XR Goggles

**2. Physics & 1st Person Camera**

**3. Storytelling & Mechanics**

- Introduction to the VR/AR Design Document
- Concept & Story
- Story & Map Progression

**4. Worldbuilding, Maps & Environments**

- Learn the X, Y, Z Axes
- Learn the Transform tools: Move, Scale, Rotate
- Understand the concept of the local and global space

**5. Introduction to C# for Unity**

- Introduction to Visual Studio for C#
- Script your first C# Mini-Project
- Understand the Unity Console/Error Window

**6. Creating The Design Document**

- Introduction to the key parts of your VR/AR Design Document:
- Concept, Story, Message, Progression
- Mechanics, Interactivity, Rewards
- Look & Feel

**7. Setting up Unity for HTC VIVE Headset**

- Understand the naming conventions for your app

**8. Build & Light your Project Scene**

**9. Setting up Unity for Mobile**

**10. Movement and Locomotion**

**11. UI/UX**

- Understand the optimal position to place your UI in the scene

**12. Interactivity****13. Heroes, Villains, and Rewards**

- Designing Characters and Incentives

**14. VR to AR****15. Augmented Reality****16. Final Presentations****The Future:**

- Laney AR/VR Certificate, Jobs, Internships, Collaborations, and Distribution: Steam, ITCH, GDC, VR/AR Jams
- AR & VR Opportunities: Medical, Military, Entertainment, Therapy, Construction

**11B. LAB CONTENT:****XR Design: Creating Augmented & Virtual Reality Content  
16 Week Lecture/Lab Syllabus (v.06)****1. Gamification & AR/VR/XR Overview**

**Unity LAB Challenge:** Build a 3D Environment

- Set up Unity, Github, Slack, Itch & Steam accounts
- Launch and Save a Unity Project
- Import Free Unity Assets
- Build a Terrain with Free Unity Assets: Add Trees, Rocks & Water

**2. Physics & 1st Person Camera**

**Unity LAB Challenge:** Add & Control Characters & Cameras

- Add and animate a Free Unity character
- Add and Control a 1st Person Camera
- Add Colliders & Physics
- Test Your Scene

**3. Storytelling & Mechanics**

**LAB Workshop:** Map the Story and its Interactivity on Paper (**Groups**)

- Introduction to the VR/AR Design Document
- Concept & Story
- Story & Map Progression

**4. World building, Maps & Environments**

**Unity LAB Challenge:** Build a Greybox Environment from your Map

- Learn how to add a primitive
- Learn how to apply different materials to scene objects
- Learn how to move, scale, and rotate a primitive

## 5. Introduction to C# for Unity

**Unity LAB Challenge:** Script your first C# Mini-Project

- Prototype AR & VR Interactive Mini-Project with a C# script
- Build a script that runs successfully, and view the results in Unity
- Test Your AR & VR Interactive Scripts on mobile & HTC devices

## 6. Creating The Design Document

**LAB Workshop:** Pitch & Design Document Workshop (**Groups**)

- Create your Project's Outline & Flowchart

## 7. Setting up Unity for HTC VIVE Headset

**Unity LAB Challenge:** Export your Greybox to HTC VIVE

- Change the build settings in Unity to target the HTC Vive
- Install Steam and SteamVR

## 8. Build & Light your Project Scene

**Unity LAB Challenge:** Build & Light your Project Scene from Greybox

- Lighting for Look & Feel
- Lighting for high VR performance

## 9. Setting up Unity for Mobile

**Unity LAB Challenge:** Export your Scene to Mobile

- Install the latest Android or iPhone SDK
- Test your AR experience on a mobile device

## 10. Movement and Locomotion

**Unity LAB Challenge:** Creating a C# Teleportation Script

- Create Teleportation
- Create way-points
- Create VR/AR buttons, levers and triggers

## 11. UI/UX

**Unity LAB Challenge:** Build The User Interface

- Design The User Interface
- Design The User Experience
- Create a button and a canvas in our scene

## 12. Interactivity

**Unity LAB Challenge:** Create C# Grabbable Objects Script

- Create Primitive objects for your grab script
- Add Grabbable objects to your scene and move them
- Select objects from a distance using your controller
- Make objects fall to the ground once you let go of them

### 13. Heroes, Villains, and Rewards

**Unity LAB Challenge:** Code a Simple C# Enemy Artificial Intelligence

- Add a Scorecard UI Element
- Code a Simple C# Enemy A.I. Script
- Test your enemy
- 14. **VR to AR**

**Unity LAB Challenge:** Convert elements of your VR Prototype to AR

### 15. Augmented Reality

**Unity LAB Challenge:** Build a simple AR Prototype

- Build a simple AR app
- (or) Refine Your AR/VR Project

### 16. Final Presentations **(Project Two - 30%)**

- Submit to STEAM & ITCH

## 12. METHODS OF INSTRUCTION (List methods used to present course content.)

1. Activity
2. Lecture
3. Lab
4. Observation and Demonstration
5. Discussion
6. Critique
7. Projects
8. Visiting Lecturers
9. Multimedia Content

## 13. ASSIGNMENTS: 4.00 hours/week (List all assignments, including library assignments. Requires two (2) hours of independent work outside of class for each unit/weekly lecture hour. Outside assignments are not required for lab-only courses, although they can be given.)

Out-of-class Assignments:

1. Researching and reading AR/VR theory assignments
2. Viewing and Critiquing AR/VR content
3. Hands on projects
4. Individual and Peer Reviews
5. AR/VR topic Document creation

ASSIGNMENTS ARE: (See definition of college level):  
Primarily College Level

## 14. STUDENT ASSESSMENT: (Grades are based on):

ESSAY (Includes "blue book" exams and any written assignment of sufficient length and complexity to require students to select and organize ideas, to explain and support the ideas, and to demonstrate critical thinking skills.)

COMPUTATION SKILLS

NON-COMPUTATIONAL PROBLEM SOLVING (Critical thinking should be demonstrated by solving

unfamiliar problems via various strategies.)  
SKILL DEMONSTRATION

## 15. TEXTS, READINGS, AND MATERIALS

### A. Textbooks:

Jonathan Linowes. *Unity Virtual Reality Projects*. 1st Packt Publishing, 2015.  
Ray Wenderlich, etal. *Unity games by tutorial*. 2nd RazewareLLC, 2017.

E-Text Author: Unity, Title: Photogrammetry Workflow, Edition: First, Free text, Publishers: Unity,  
Year of Publication: 2018.

\*Date is required: Transfer institutions require current publication date(s) within 5 years of outline addition/update.

### B. Additional Resources:

Library/LRC Materials and Services:

The instructor, in consultation with a librarian, has reviewed the materials and services of the College Library/LRC in the subject areas related to the proposed new course

Are print materials adequate? Yes

Are nonprint materials adequate? Yes

Are electronic/online resources available? Yes

Are services adequate? Yes

Specific materials and/or services needed have been identified and discussed. Librarian comments:  
Please provide a list of recent, recommended supplementary (non-textbook) titles to the acquisitions librarian.

### C. Readings listed in A and B above are: (See definition of college level):

Primarily college level

## 16. DESIGNATE OCCUPATIONAL CODE:

C - Occupational

## 17. LEVEL BELOW TRANSFER:

Y = Not Applicable

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### SUPPLEMENTAL PAGE

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Use only if additional space is needed. (Type the item number which is to be continued, followed by "continued."  
Show the page number in the blank at the bottom of the page. If the item being continued is on page 2 of the outline, the first supplemental page will be "2a." If additional supplemental pages are required for page 2, they are to be numbered as 2b, 2c, etc.)

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### STUDENT LEARNING OUTCOMES

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1. **Outcome:** Students will be able to design and create an AR or VR project from concept to final product.  
*This outcome maps to the following Institution Outcomes:*
  - Career Technical Education - Students will demonstrate technical skills in keeping with the demands of their field of study.

**Assessment:** Instructor and class critique of final AR or VR production according to Rubric distributed and discussed in class.

2. **Outcome:** Collaborate effectively with production team.  
*This outcome maps to the following Institution Outcomes:*
  - Communication - Students will effectively express and exchange ideas through various modes of communication.

**Assessment:** Instructor evaluation of student activities during class projects.

3. **Outcome:** Adapt professional skills to most current VR and AR technology industry standards

*This outcome maps to the following Institution Outcomes:*

- Personal and Professional Development - Students will develop their knowledge, skills and abilities for personal and/or professional growth, health and well being.

**Assessment:** Instructor evaluation of student competency in most current VR industry tools.

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