

NYU Abu Dhabi – Interactive Media and Technology

ALTERNATE REALITIES

IM-UH 3111

Spring 2018

COURSE SYLLABUS

Instructor

Pierre Depaz (pierre.depaz@nyu.edu)

Meeting Time

Tuesday – 4:05 - 3:55PM

Thursday – 2:40 - 5:20PM

Classroom

C3-153

Office

C3-032

Office Hours

Open door policy

Credits

4

Class website

<https://github.com/periode/alternate-realities>

This course counts towards the following NYUAD degree requirement

- Concentrations > Multidisciplinary Minors > Interactive Media and Technology

Course Description

Alternate realities, whether all-encompassing (Virtual Reality - VR) or additive (Augmented Reality -AR) are becoming more and more ubiquitous. This can be attributed to two emerging dynamics. The first is the wide availability on the consumer market of a range of newly developed hardware, from cheap DIY kits such as the Google Cardboard to full motion-capture systems like the HTC Vive. The second, in parallel, is the stream-lined development process that has emerge as a result of relatively free software and easily accessible professional code libraries. The combination of both phenomenons has made it easier than ever to prototype, experiment with, and release alternate forms of reality. With these new technologies at our disposal, how can we harness them to push our conceptual understanding of storytelling, personal expression, and social experiences into uncharted territories?

In this hands-on design and production course, students will be introduced to 3D software development through the Unity platform as well as a design framework for producing interactive virtual reality experiences. Over the course of the semester, students will learn the basics of 3D modeling, networking, interaction design, and spatialized sound. Each student group will ultimately produce a project that will be experienced and interacted with through an alternate reality platform.

Course Objectives

When the course is finished, students will:

- Develop a critical framework for understanding and analyzing the fundamentals of design, behavior and communication in the context of alternate realities.
- Gain the ability to design and develop a 3D interactive application using the Unity game engine.
- Develop a conceptual model for interaction design, leveraging both user-testing best practices and core principles of user experience.
- Understand the fundamental structure and purpose of design documents.
- Learn to model, import and manipulate 3D objects.
- Learn to record, design and manipulate sound geared towards a 3D environment.
- Gain a basic understanding of how to implement and manage multi-user networking systems.
- Gain exposure to and experience with innovative and forward-thinking forms of storytelling.

Course Assignments

This is a production-oriented course, grounded in rigorous design practice and technological framework. Students will be expected to deliver multiple group projects during the semester, following a clearly defined iterative design loop.

The **first project** will introduce students to both Unity and Virtual Reality, and will be developed with the Google VR SDK. This project will be the only solo project, allowing students to familiarize themselves with the development workflow.

The **second project** will be a group project developed on the HTC Vive, introducing students to the new hardware possibilities, including new means for interaction and spatial design.

The **third project** will be a class-wide project on multiple HTC Vive. Each group will develop a specific set of interactions, which will then be integrated into one common, networked environment where multiple users at once can interact.

All students will be expected to keep a **development blog**, documenting their successes and failures during the development of each of their projects, including technical difficulties, design iterations and user feedback.

Grading

Projects should be submitted via email. The submission for projects will be in a .zip file containing the source code of the project. When applicable, one submission per group is enough.

The **development blog** will be graded on **(1)** the regularity at which it is being updated (*at least once a week, or every time a specific improvement is made*), **(2)** the thoroughness of the post (*showing the design thinking that led to this or that evolution, the taking into account of user feedback, etc.*) and **(3)** the use of visual media (*screenshots of code/editor, pictures of paper sketches, videos or gifs of interactions implemented*). Reading responses are also encouraged.

Homework assignments will be given on a semi-regular basis to evaluate the knowledge acquired throughout the class lab sessions. Students are expected to complete them and upload their code to the class website.

The **first project** will be graded on **(1)** the development of a VR world which takes advantage of the malleability of the digital medium to showcase a strong identity (*peaceful, stressful, grandiose, empty, etc.*), and **(2)** the implementation of at least one interaction with the world (*changing/removing/adding elements*).

- **15%**

The **second project** will be graded on **(1)** the implementation of at least two interactions using the HTC Vive's hand controllers (*triggers and/or touchpad and/or gesture*), **(2)** the development of some

version of a UI system and **(3)** an emotionally evocative virtual world using as little external assets as possible.

- **15%**

The third project will be graded on **(1)** the implementation of at least two interactions necessitating 2+ users to take place, **(2)** the development of some version of a communication system independent of those interactions and **(3)** an emotionally evocative virtual world which stands opposite of other worlds built by other students.

- **30%**

All projects will be graded on **(1)** functionality (*is the application free of unintentional bugs? is it usable by someone else than the developers? in case of a networked project, does it allow for a smooth usage?*), **(2)** on how well the interactions are implemented (*are they surprising? can they be used in creative ways? what message do they convey?*) and **(3)** how clear is the identity and atmosphere of the virtual world?

In addition, students participation during discussions in lectures will contribute to a higher final grade.

Grade calculation

Students will be given grades based on a 100 point scale. Each assignment will be graded on a point scale, and these points will be added up to determine the final grade, according to the following:

92 - 100 A
90 - 91 A-
88 - 89 B+
etc.

The following are the components of the final grade:

Development Blog	20%
First Project	15%
Second Project	20%
Homework	15%
Final Project	30%
Total	100%

Readings

All readings will be available as PDFs on the class GitHub (<https://github.com/pierredepaz/alternate-realities/wiki/pdf>). Required readings will be available at the NYU Bookstore.

40% of NYUAD's waste is paper, and none of the paper used in the public printers is sourced from either recycled or sustainable wood. **Please refrain from printing any of those readings.**

Required Text:

- *Invisible Cities*, Italo Calvino, Harcourt Brace Jovanovich, 1978, ISBN 9780156453800

Recommended Text:

- *Aesthetics of Interaction in Digital Art*, Katja Kwastek, MIT Press, 2013, ISBN 9780262317207
- *Hamlet on the Holodeck*, Janet Murray, MIT Press, 1998, ISBN 9780262631877

Equipment

Students should have a laptop that has the free version of Unity installed, or can borrow one from the IM lab. They will have Google Cardboard delivered at the NYU Bookstore. All other hardware will be supplied.

Attendance

Attendance and arriving on time to all class sessions is required and expected, too many unexcused absences will lower your final grade. Two unexcused absences lower your final grade by a letter. Each subsequent unexcused absence will lower another letter grade. Two tardies will count as one absence. Arriving more than 15 minutes late will also count as an absence. If you will be missing a class due to illness, or unavoidable personal circumstances, you must notify your professor in advance via email for the absence to be eligible to be excused.

Academic Integrity

As set forth in NYU Abu Dhabi's Academic Integrity Policy, the relationship between students and faculty at NYU Abu Dhabi is defined by a shared commitment to academic excellence and is grounded in an expectation of fairness, honesty, and respect, which are essential to maintaining the integrity of the community. Every student who enrolls and everyone who accepts an appointment as a member of the faculty or staff at NYU Abu Dhabi agrees to abide by the expectation of academic honesty.

The full policies and procedures relating to Academic Integrity may be found on the NYUAD Student Portal: <https://students.nyuad.nyu.edu/campus-life/student-policies/community-standards-policies/academic-integrity/>

Schedule

Week 1 - 01/23 - INTRODUCTION

Lecture

- Housekeeping.

Lab

- Unity introduction
- Game Objects / Scripts / Prefabs

Homework

- Set-up your development blog and update your URL on the Github Wiki.
- Blog about a particular environment that you like, and why (from real life, from a movie, a theater set, in a book, in a game, etc.)

Week 2 - 01/30 - ENVIRONMENTS

Readings

- *Hamlet on the Holodeck*, Janet Murray, MIT Press, 1998, Chap 3 & 4.
- *Responsive Environments*, Myron Krueger, University of Wisconsin, 1975.

Lecture

- The features and impacts of virtual environments
- Discussing Assignment #1

Lab

- External Assets
- 3D Modeling
- Physics

Homework

- Blog about a particular interaction that you like (between two human beings, a human and non-human, an artist and her audience, an installation an object and a human being, etc.).

Week 3 - 02/06 - INTERACTION

Readings

- *The Poetics of Interactivity*, Margaret Morse, in *Women, Art and Technology*, MIT Press, 2003.
- *Aesthetics of Interaction in Digital Art*, Katja Kwastek, MIT Press, 2013.

Lecture

- What is an interaction?
- The specifics of interaction in Virtual Reality.

Lab

- Raycasting
- Work Session

Homework

- Prepare for project presentation

Week 4 - 02/13 - PRESENTATION

FIRST PROJECT DUE

Readings

- *None*

Lecture

- Projects presentations

Lab

- Getting up and running with the Vive SDK

Homework

- Form groups for project #2

Week 5 - 02/20 - INTERACTING WITH THE VIVE

Readings

- *The Humane Representation of Thought*, Brett Victor, worrydream.com/TheHumaneRepresentationOfThought/note.html, 2014.

Lecture

- The interface effect

Lab

- User Interface in Unity

Homework

- Read *The Library of Babel*, Jose-Luis Borges.
- Implement a simple UI system using the touchpad of the Vive Controller to navigate the Babel dataset. Think about the following elements: how do you represent the value you control? how do you allow your user to navigate an information space? where does the user exist in relation to the interface?

Week 6 - 02/27 - NETWORKING I

Readings

- PUN Tutorial, <http://www.paladinstudios.com/2013/07/10/how-to-create-an-online-multiplayer-game-with-unity/>, Paladin Studios

Lecture

- Photon Networking with the HTC Vive

Lab

- Work Session

Homework

- Prepare for presentation

Week 7 - 03/06 - PRESENTATIONS

SECOND PROJECT DUE

Readings

- *The Anatomy of a Design Document*, Tim Ryan, Gamasutra, 1999.

Lecture

- Guest Lecture

Lab

- Project Presentations
- Discussing project #3
- Writing a Design Document

Homework

- Prepare your design documents based on your ideas.

===== BREAK =====

Readings

- *Invisible Cities*, Italo Calvino, Penguin, 2000.

Homework

- Read your classmates design documents.
- Send me a list of two projects you would like to work on and two people you would like to work with.

===== BREAK =====

Week 8 - 03/27 - SOCIAL REALITY

DESIGN DOCUMENT DUE

Readings

- *Alienation from Interaction, in Interaction Ritual*, Erving Goffman, Pantheon Books, 2003.
- Lessons from Building Social Experiences in VR, Michael Booth, <https://code.facebook.com/posts/1749617585290346/lessons-from-building-social-experiences-in-vr/>
- *Why VR Isn't Going to Further Isolate Us Like Your Parents Think It Will*, Shawn Kilmer, <https://virtualrealitypop.com/why-vr-isnt-going-to-further-isolate-us-like-your-parents-think-it-will-4a0fae73f707#.m0ieytwex>

Lecture

- Human interaction

Lab

- Photon Networking in Unity, part 2.

Homework

- Blog about a particular city that you liked and why. Focus on the spatial layout and how inhabitants evolve geographically.
- Implement a simple networked environment using Photon, allowing for a Spectator Mode if using a non-VR device.

Week 9 - 04/03 - SPATIAL FICTIONS

Readings

- *Game Design as Narrative Architecture*, Henry Jenkins, <http://web.mit.edu/21fms/People/henry3/games&narrative.html>

Lecture

- Building fictional spaces

Lab

- Work Session

Homework

- Find a particular sound effect that you like (from a movie, video game, real-life), post it on your blog and explain why you like it.

Week 10 - 04/10 - SOUND DESIGN

Readings

- *Game Sound: An Introduction to the History, Theory and Practice of Video game Music and Sound Design*, Karen Collins, MIT Press, 2008, Chap. 7.

Lecture

- Sound Design in Digital Worlds
- Working with sound in Unity

Lab

- Work Session

Homework

- User-test your project, and prepare for next week's presentations.

Week 11 - 04/17 - Dramaturgy / Lighting

MILESTONE PRESENTATIONS DUE

Readings

- *The Scenography of Kentucky Route Zero*, https://www.youtube.com/watch?v=nh_o8JEmVdw
- *The Bauhaus Theater: Oskar Schlemmer*, Samela Nikolic, UDK Brojevi, 2014.

Lecture

- In-class playtest session

Lab

- Shaders
- Lights

Homework

- Answer the following questions on your blog:
 - What is **X (pick one, such as a book, the internet, TV, radio, stone carvings)** as a media? What kinds of conversation does it permit? What are the intellectual tendencies it encourages? What sort of culture does it produce?
 - What is **Virtual Reality** as a media? What kinds of conversation does it permit? What are the intellectual tendencies it encourages? What sort of culture does it produce?

Week 14 - 04/24 - USER-TESTING / MILESTONES

Lecture

- User-testing presentations.

Lab

- Public user-testing.

Homework

- Answer the following questions on your blog:
 - What makes VR different from the other mediums you've worked with?
 - Give an example where, in your opinion, VR is less interesting than an older medium (digital screen, print, recorded music, etc.)
 - Give an example where, in your opinion, VR is more interesting than an older medium (digital screen, print, recorded music, etc.)

Week 15 - 05/01 - MEDIA

Readings

- <http://voicesofvr.com/473-can-vr-bridge-the-culture-gap-counter-cultural-indoctrination/>
- *Amusing Ourselves to Death*, Neil Postman, Penguin Books , 1985, Introduction.

Lecture

- Interpersonal relations
- Virtual Society

Lab

- Work Session

Homework

- Prepare for final presentation

Week 16 - 05/ - FINAL

FINAL PROJECT DUE

Readings

- None

Lecture

- Project presentations

Lab

- Documentation
- Class wrap-up

Homework

- None