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| Screen Shot 2015-04-16 at 9 | Course Name: | Application Development and Software Prototyping |
| Course Number: | AGGP231C |
| Course Sections: | AGGP231C-1 |
| Course Format: | Lecture: 2 hours per week  Lab: 3 hours per week |
| Semester/Year: | Fall, 2020 |

Course Description:

Current application development can target multiple platforms across a range of devices such as phones, tablets, smart devices, consoles, and personal computers. Students will study current technologies for cross platform development and deployment. Several intense hands-on software prototype projects will be required where students will design a concept, build a proof of concept, and conduct a postmortem review. (Prerequisites: AGGP 131C, AGGP 140C, and CPET 125C, or with permission of Program Coordinator for AGGP.)

Major Course Objectives/ Learning Outcomes:

Prototyping AR and VR applications with Unity’s XR Framework. Below is a list of the VR and AR technologies that we plan to cover. Other specific technologies may be added as the semester progresses.

* Android mobile (Vuforia and ARCore)
* HMD Odyssey

Prerequisites:

Courses: AGGP 131C, AGGP 140C, and CPET 125C, or with permission of Program Coordinator for AGGP

Instructor(s):

Parker Johnstone (Remote)

Discord: Virtual Little 231 (voice) or Direct Message (DM)

E-mail: [pjohnstone@ccsnh.edu](mailto:pjohnstone@ccsnh.edu)

**Instructor Availability:**

Will respond to Discord messages as soon as possible.

Schedule an appointment for dedicated help.

**Required Text(s) and Material(s)**:

None

Supplemental Text(s) and Material(s):

Software:

Visual Studio 2019 Free; Community Versions are free downloads.

Unity 2019.4.x (LTS) Free; Most current version as of the beginning of the course

SDK’s and Plug-ins Free; Provided through Unity or Online

Canvas Orientation:

If this is your first time using Canvas at CCSNH, please complete the [Canvas student orientation](https://ccsnh.instructure.com/courses/101). This orientation offers the opportunity to familiarize you with navigating and using Canvas.

Available Technical Support - If you need help navigating this course, explore the Canvas [Student Guide](https://community.canvaslms.com/docs/DOC-10701). The Student Guide, Chat, and Phone offer helpful information and are always found by clicking on the  help button on the bottom-right side of every page in Canvas.

Couse Schedule:

Lecture: Monday 11:00 AM – 1:00 PM (EST) \*Labor Day week, Lecture will take place during Lab (September 8th)

Lab: Tuesday 2:00 PM – 5:00 PM (EST) \*Labor Day week, no Lab, replaced by Lecture

Assignments: Assignments are due at the beginning of the next Lecture

Projects: Projects require an accepted Proposal (concept), are code complete, and include a recorded demo video

\*Note: schedule and topics subject to change, at Instructor’s discretion

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| **WEEK** | **LECTURE DATE** | **LAB DATE** | **TOPIC** | **NOTES** | **ASSIGNMENT DUE** |
| 1 | 8/31 | 9/1 | Course Intro, Unity Version + Module, Android Development, Swipe + Virtual Joystick | Swipe/Joystick Minigame - 2D (Golf, Reigns, drive a car through gates or character through coins) |  |
| 2 | 9/8 | 9/9 | Mobile AR 1 - Vuforia | Image Targets, Swipe/Joystick Minigame – use swipe/joystick interaction with 3D objects (targets can represent boardgame pieces or enemy spawners) | Assignment 1: Due 9/8 |
| 3 | 9/14 | 9/15 | Mobile AR 2 - Unity AR Foundation 1 | AR Foundation introduction, basic scene, making the scene appear on a surface – Either rebuild previous minigame or try something new | Assignment 2: Due 9/14 |
| 4 | 9/21 | 9/22 | Mobile AR 3 - Unity AR Foundation 2  AR Project Proposal | UI/UX - Plane detection, scene position, rotation, scale, anchoring, and spatial vs. diegetic UI. AR Project Proposal notes | Assignment 3: Due 9/21 |
| 5 | 9/28 | 9/29 | AR Project |  | Assignment 4, AR Project Proposal: Due 9/28 |
| 6 | 10/5 | 10/6 | AR Project |  |  |
| 7 | 10/12 | 10/13 | AR Project |  |  |
| 8 | 10/19 | 10/20 | VR 1 - VR Intro, HMD Odyssey Setup - Reticle/Gaze | Equipment setup/check, Reticle/Gaze interaction – Minigame (Gaze-based) | AR Project Due: 10/19 |
| 9 | 10/26 | 10/27 | VR 2 - Grab/Manipulate Objects | Using the controllers to grab and manipulate objects – Minigame (switch puzzle, Job Simulator) | Assignment 5: Due 10/26 |
| 10 | 11/2 | 11/3 | VR 3 - Player Movement | Teleport to target and controller joystick rotation – Minigame (include gaze and manipulation) | Assignment 6: Due 11/2 |
| 11 | 11/9 | 11/10 | VR 4 - UI/UX  VR Project Proposal | Scale, motion, user comfort, and spatial vs. diegetic UI. VR Project Proposal notes | Assignment 7: Due 11/9 |
| 12 | 11/16 | 11/17 | VR Project |  | Assignment 8, VR Project Proposal: Due 11/16 |
| 13 | 11/23 | 11/24 | VR Project |  |  |
| 14 | 11/30 | 12/1 | VR Project |  |  |
| 15 | 12/7 | 12/8 | Presentation Video Preparation | Post Mortem (what went well, what went wrong, how to improve) | VR Project: Due 12/7 |
| FINALS |  | 12/15 | Presentations | Students will play their presentation video for the class | Presentation: Due 12/14 |

Computers/Software/Printers:

This is an ONLINE course; students are expected to use their own PC/Laptop to complete assignments and projects.

It is a computer security policy of NHTI that student PC’s or laptops must NEVER be connected to the NHTI network using an 802.3 (wired Ethernet) connection.

Neither the instructor nor NHTI is responsible for providing technical support for a student’s PC/Laptop.

Augmented Reality (AR), 8/31/2020 - 10/19/2020

Students are required to use their own Android smartphone for the AR portion of the class.

Refer to the list of supported devices provided by Google, under “Android Play”: <https://developers.google.com/ar/discover/supported-devices#android_play>

*Please contact* Professor Walek *if you do not have an Android phone/tablet that meets the requirements for this course*.

Virtual Reality (VR), 10/19/2020 – 12/7/2020

Course requires the use of a VR headset; students must contact Professor Walek for access to NHTI provided HMD Odyssey devices.

Students may use their own VR headset if it meets the requirements of the class; students must contact either the instructor or Professor Walek to confirm.

It is the student’s responsibility to have access to a PC and the ability to:

* connect to the web and access SIS and Canvas,
* use their NHTI email account to send and receive email; including attachments,
* use a word processor (e.g. Word) to produce documents,
* store and retrieve files online through GitHub or GitHub Desktop
* print pdf and Microsoft Office documents, and
* install and use software utilized in this course.

Technical Standards:

If you have a concern about whether you will have an issue with the technical standards for the course, please communicate with Professor Walek and/or the Office of Accessibility Services <https://www.nhti.edu/student-resources/where-can-i-get-help-my-studies/accessibility-services>

The goal of the assignments and projects in this course, and the limited time students are given to complete them, is to develop and measure the skills, knowledge, and practices required by the gaming and/or computer industry.

Class Cancelations:

Campus wide Cancellation:

<http://www.nhti.edu/student-life/student-handbook/cancellations-and-delays>

Students should also sign up for alerts to be sent to their email and/or mobile phone. <https://www.nhti.edu/student-life/campus-safety/nhti-alerts>

Cancelling this Class:

When the instructor cancels or delays the start of lecture/lab, the instructor will post the cancellation to the course’s Canvas and send an email to students’ email accounts as far in advance as possible. The same notice will be posted in the corresponding classroom/lab.

Student Communication Responsibility:

* Students are responsible for reading their NHTI student email at least once each day.
* Students are responsible for regularly accessing this course’s Canvas for the latest course announcements and assignments.
* Canvas will be used for instructor announcements; an email noting the announcement will be sent to each student’s NHTI email account.
* Course materials will be posted to Canvas and/or a GitHub repository.
* Changes and updates to course materials will be posted to the course GitHub repository.
* Grades for assignments, labs, quizzes, etc. will be posted to Canvas regularly.

Instructional Methods:

Course concepts are applied in course assignments which will or may include labs, quizzes, activities and\or homework, and a final project.

* **Lectures** – the source for lecture material will be based on the required research, instructor notes as well as specified supplemental materials.
* **Labs** – each segment of the course will require laboratory work to reinforce theory learned during lecture. Labs due dates will be indicated and should be submitted by the due date to Canvas. Labs not submitted at the beginning of the lab session are considered late.
* **Projects/Final Project** – the Final Project will emphasize the student’s ability to expand upon material learned in the course, and\or explore, learn, and demonstrate new areas of their interest.
* **Activities, homework and quizzes** – will reinforce materials covered during lecture or lab as well as expose students to new material.

Assessment of Student Level of Achievement Measured Against Specific Course Objectives:

Students level of achievement against specific course objectives is measured by:

* Assignments
* Projects
* Recorded Video Presentations
* Performance during weekly lab
* Participation and conduct during lab and lecture

Grade Calculation

* **Homework, Activities and\or quizzes** 10%
* **AR Lab Assignments/Lab Performance** 30%
* **VR Lab Assignments/Lab Performance** 30%
* **Final Project**  20%
* **Professionalism** 10%
  + **The Final Project a required assignment in this course.**
  + **Failure to turn a final project will result in a F grade for this course regardless of other work.**

Professionalism includes the following:

*“If you do not act and behave like a professional now, you will never be one.”*

* *Jennell Jaquays*

Students are expected to act professionally about attendance, punctuality and doing work that is assigned (whether it’s graded or not) in way that is meant to be similar to that which would be expected in a commercial working environment.

***All students are expected to put forth an honest effort in to their work at all times during the term****.*

***Any student who commits an egregious unprofessional act or behaves in a consistent unprofessional manner will find themselves removed from the course with an AF Grade.***

Grading System:

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| A | 93 - 100 | B | 83 – 86.9 | C | 73 – 76.9 | D | 63 – 66.9 |
| A- | 90 – 92.9 | B- | 80 – 82.9 | C- | 70 – 72.9 | D- | 60 – 62.9 |
| B+ | 87 – 89.9 | C+ | 77 – 79.9 | D+ | 67 – 69.9 | F | 0 – 59.9 |

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| Other Grades | W | WP | WF | AF |

For the definition of the grades W, WP, WF, and AF, please refer to the NHTI Grading Policy at: <http://www.nhti.edu/academics/requirements-policies/grading-system>

Be aware of Department policy related to grades lower than C for major courses in AGGP. You must receive these grades or better on order to continue on with major field courses that require AGGP 231C.

**Attendance:**

< Ask Frank About this >

Lecture and Lab Etiquette:

Unless explicitly allowed by the professor, students should not use PC’s, cell phones, or be texting during the lecture or lab. Please set cell phones to silent during lab or lecture, and keep “chit-chat” to a minimum during lab time.

The use of cell phones, hand held electronic devices and use of computers, the school’s or yours for purposes other than the curriculum, are strictly prohibited. Using them may cause you to receive an unexcused absence for that day. The reason for the unexcused absence is that you are not effectively attending class lecture or lab session. You are also a distraction to other students and as such are disruptive to the learning process. Each unexcused absence will be considered as the equivalent of a missed class

For safety reasons and for the protection of equipment, no food or drink is allowed in the lab. Student may bring a beverage to lecture but may not eat during the lecture.

Student Delivery of Completed Assignments:

* All lab assignments will be returned to the instructor electronically using Canvas. The instructions for the procedure to return assignments electronically are posted to this course’s Canvas.
* The instructor may require some work to be demonstrated or to be submitted on paper.

Collaboration Versus Cheating Policy:

* Students are encouraged to provide appropriate support to their peers. For example, sharing concepts and ideas with peers is appropriate support.
* It is NOT appropriate to share your work with another student or to provide answers to assigned course work (e.g. homework, lab results, lab exercises, quizzes & tests, etc.)
* Unless otherwise specified by the instructor, students repeating a course cannot submit, or use in any way, their work from a previous semester. Doing so will be considered cheating.
* The department head may impose additional and more serious disciplinary action when cheating is discovered.
* See also NHTI policy: <http://www.nhti.edu/academics/requirements-policies/plagiarismcheating-policy-and-procedures>

**Minimum Grade:**

The minimum grade in major courses for AGGP, CPET and EET students is C-. Any grade below this indicates that the student is not ready to continue with subsequent courses or to successfully enter the workforce. As such, major courses with a grade of less than the required minimums will not count toward meeting that program’s completion requirements.