**Global Learning Initiatives Program Course Syllabus**

**Course Information**

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| Course Name | AR/VR Design & Fabrication Studio (CITE490K) |
| Lecturer(s) | Prof. Juhong Park |
| Course Description | This is a fundamental course in preparation for the study of AR/VR/MR technologies. Students can learn the basics of Unity 3D, C# Programming, and Physical Computing. Throughout a semester, students develop an independent project using an Oculus Quest 2 or Hololens 2 to combine a physical and a virtual environment. |
| Course Objectives | By developing a hybrid reality project, students will learn 3D Model/Space building skill sets, interaction technology, and redefine what is the reality that we live in. |
| Suggested Proficiencies | 3D CAD Modeling using Rhino 3D, 3DS Max, Maya, Sketchup, or Inventor.  Programming Skills such as Python, Java, or C/C++/C#  Object Oriented Programming  Physical Computing, such as Arduino, or Pi |
| Reading List | Reading materials will be offered online. |
| Grading Criteria | Usual grades (60%) = Weekly Mini Project Submission 14 weeks in total  Final Project grade (40%) |

**Course Schedule**

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| Class  (Week) | Date | Course Topic | Lecturer |
| 1 | Week 1 | 1. Introduction  1.1 Final Project Overview | *Prof. Juhong Park* |
| 2 | Week 2 | 2. 3D Model Making  2.1 Rhino Introduction | *Prof. Juhong Park* |
| 3 | Week 3 | 3. Environment  3.1 Lighting Intro  3.2 Camera Intro | *Prof. Juhong Park* |
| 4 | Week 4 | 4. Advanced Model Making  4.1 Grasshopper Intro | *Prof. Juhong Park* |
| 5 | Week 5 | 5. Advanced Model Making  5.1 Rhino-Python  5.2 Algorithmic Form | *Prof. Juhong Park* |
| 6 | Week 6 | 6. Advanced Model Making  6.1 OOP Intro  6.2 Inheritance  6.3 Association | *Prof. Juhong Park* |
| 7 | Week 7 | 7 Cellular Automata / Flocking  7.1 Generative Form  7.2 Agent-Based Form | *Prof. Juhong Park* |
| 8 | Week 8 | 8 Unity 3D + Oculus Quest - Introduction  8.1 User Interfaces  8.2 Oculus Libraries | *Prof. Juhong Park* |
| 9 | Week 9 | 9. Unity 3D + Oculus Quest – Space Making  9.1 Exchanging Geometries  9.2 Setting Cameras | *Prof. Juhong Park* |
| 10 | Week 10 | 10. Unity 3D + Oculus Quest + Arduino  10.1 Virtual + Physical Hybrid Environment | *Prof. Juhong Park* |
| 11 | Week 11 | Hololens 2 – Introduction  User Interfaces | *Prof. Juhong Park* |
| 12 | Week 12 | Hololens 2 - Environments  Gravity/Physics  Space Awareness | *Prof. Juhong Park* |
| 13 | Week 13 | Hololens 2 - Interaction  Buttons  Finger Gesture | *Prof. Juhong Park* |
| 14 | Week 14 | Final Exam Week-Independent Project Preparation | *Prof. Juhong Park* |
| 15 | Week 15 | Final Project Review | *Prof. Juhong Park* |