**LMC 4733: Mixed Reality Experience Design**

**Overview**

This course gives students an opportunity to learn about Mixed and Augmented Reality (MR and AR) as a platform for interaction design. MR/AR refers to computer systems that combine virtual content with the physical environment, allowing users to interact with these combined physical/virtual worlds in appropriate locations. Students will use the Argon AR Web Browser (developed here at Georgia Tech) to experiment with MR and AR.  (For more information about Argon, see argonjs.io). The goal of the course is explore the potentials of MR and AR in particular through the use of this innovative browser.  In addition to various programming exercises, students will work in small groups on a major semester long project. The project will be drawn from a list provided at the beginning of the semester, or groups can choose their own project. All projects will be subject to approval.

**Course Objectives**

By the end of the course, students will be able to:

* Apply appropriate design principles and techniques for creating mobile AR/MR experiences;
* Employ techniques and technologies for programming and content creation for AR/MR experience in an AR browser;
* Work in a team to realize a significant digital media prototype.

**T-Square**

In addition to this syllabus, resources (lecture slides and readings), assignments will be available on t-square.

**Assignments**

The major activity of the class is centered around the group project (below), but there will also be individual assignments.  The goal of these assignments is to ensure everyone in the class gains experience and understanding of AR and MR design and implementation. In addition, in the second half of the semester, each student will deliver an oral report and lead discussion on one article (some of which are listed below).

**Readings**

* Auslander, Philip. Liveness: Performance in a Mediatized Culture, 2008.
* Bolter, Catharsis and Flow
* Lombard, M., & Ditton, T. (1997). At the heart of it all: The concept of presence. Journal of Computer-Mediated Communication, 3(2).
* MacIntyre, B., Bolter, J., and Gandy, M. (2004) "Presence and the Aura of Meaningful Places" *7th Annual International Workshop on Presence (PRESENCE 2004)*, Polytechnic University of Valencia, Valencia, Spain, 13-15 October 2004.
* Barba, E., MacIntyre, B. and Mynatt, E. D., “Here we are! where are we? Locating mixed reality in the age of the smartphone”, Proceedings of the IEEE, 100, pp. 929-936, (2012)
* Grau, Oliver. Virtual Art: From Illusion to Immersion, 2003. (Chapter 1)
* Wright, P. and McCarthy, J. *Technology as Experience*, 2007. (Chapter 1)
* Tuan, Yi-Fu. *Space and Place: The Perspective of Experience*, 1977. (Selections)
* Buchanan, Richard. "Good Design in the Digital Age." GAIN: AIGA Journal of Design for the Network Economy. Vol 1, No 1. October, 2000.

**Project Wiki Page**

Each project team is expected to maintain a t-square wiki page for their project.  This page should be linked of the wiki group page where you list the group members. The wiki should have a summary of the project design concept, links to all the turn-ins and presentations, including the final video and poster of the project.  The content should be neatly and concisely laid out on this page, with explanations of what each linked element is.  All elements must be clearly documented and accessible from your project page.

**Grading**

Your grade for the class will be determined based on the following:

10% Short program/design/blog assignments

15% Individual reading presentation (second half of semester)  
 25% Group Progress Report (presentation and delivery of prototype)

10% Final group presentation

35% Final Submission (prototype and design document)

**Attendance**

Students are expected to attend class and participate in the discussions and presentations. Students who are absent because of participation in approved Institute activities (such as field trips, professional conferences, and athletic events) will be permitted to make up the work missed during their absences. Approval of such activities will be granted by the Student Academic and Financial Affairs Committee of the Academic Senate, and statements of the approved absence may be obtained from the Office of the Registrar. See information at <https://studentlife.gatech.edu/content/class-attendance>. You may also consult the Institute Attendance policy at http://www.catalog.gatech.edu/rules/4/.

**Disability Statement**

If you are a student with learning needs that require special accommodation, contact the Office of Disability Services at (404)894-2563 or <http://disabilityservices.gatech.edu/>, as soon as possible, to make an appointment to discuss your special needs and to obtain an accommodations letter. Please also e-mail me as soon as possible in order to set up a time to discuss your learning needs.

## Academic Integrity

Georgia Tech aims to cultivate a community based on trust, academic integrity, and honor. Students are expected to act according to the highest ethical standards. For information on Georgia Tech's Academic Honor Code, please visit http://www.catalog.gatech.edu/policies/honor-code/ or <http://www.catalog.gatech.edu/rules/18/>. Any student suspected of cheating or plagiarizing on a quiz, exam, or assignment will be reported to the Office of Student Integrity, who will investigate the incident and identify the appropriate penalty for violations.

**Student-Faculty Expectations Agreement**

At Georgia Tech we believe that it is important to strive for an atmosphere of mutual respect, acknowledgement, and responsibility between faculty members and the student body. See <http://www.catalog.gatech.edu/rules/22/> for an articulation of some basic expectation that you can have of me and that I have of you. In the end, simple respect for knowledge, hard work, and cordial interactions will help build the environment we seek. Therefore, you are encouraged to remain committed to the ideals of Georgia Tech while in this class.

**Schedule**

**Week 1**

Jan 10. Course Introduction: Introduction to Argon4 system; Overview of Tutorials;

Jan 12. Introduction to Augmented Reality: Billinghurst: Introduction and Taxonomy

**Week 2**

Jan 17: Argon-aframe tutorials; (Assignment #1 handed out)

Jan 19: Argon-aframe tutorials; Intro to three.js and github

**Week 3**

Jan 24: Intro to Design Aesthetics (the IDEO video)

*Jan 26:* Twine example*;* Team Building

**Week 4**

Jan 31: More about Argon; Assignment #1 discussion

Feb 2: Class work day: Team brainstorming; (Assignment #2 handed out)

**Week 5 -**

Feb 7: Aframe: Making Components

Feb 9: Teams present ideas and critique

**Week 6**

Feb 14: Argon assignment #2 discussion

Feb 16: History of Panoramas

**Week 7**

Feb 21: Critique and feedback

Feb 23: Flow and Catharsis (two design aesthetics)

**Week 8**

Feb 28: Individual Reading Presentations and Discussion

March 2: Class work day

**Week 9**

March 7: Individual Reading Presentations and Discussion

March 9: Class work day

**Week 10**

March 14: Individual Reading Presentations and Discussion

March 16: Progress report**:** Students present working prototypes

**11 SPRING BREAK**

**Week 12**

March 27: Individual Reading Presentations and Discussion

March 30: Class work day

**Week 13**

April 4 : Individual Reading Presentations and Discussion

April 6: Class work day

**Week 14**

April 11: Individual Reading Presentations and Discussion

April 13: Class work day

**Week 15:**

April 18: Individual Reading Presentations and Discussion

April 20: Final Presentations

**Week 16:**

April 25: Final Presentations