|  |  |
| --- | --- |
|  | **LMC-6770 Mixed Reality Design** |

**1. Instructor Name, Contact Information and Office Hours**

Instructor: Jay Bolter

Email:  jay.bolter@lcc.gatech.edu

Phone:

Office: TSRB 317

Meetings by Appointment

**2. Course Prerequisites:**(None)

**3. Core Area/Attributes Fulfilled by this Class:** (None)

**4. Course Description**

Overview:

This course is a companion to LMC 6340, giving students an opportunity to practice in more detail the technical and interface issues required for designing Augmented and Mixed Reality applications for all kinds of purposes. 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 again use the Argon AR Web Browser (developed here at Georgia Tech) to experiment with MR and AR. (For more information about Argon, see argon.gatech.edu). The goal of the course is to learn to exploit the particular affordances of MR and AR for information delivery.

All students must be able to work with web technologies and learning how to develop interactive experiences with them. Argon is built on web technologies, so the project work will be analogous to building web applications for a mobile web browser. Programming, HCI or computer graphics experience will be assets in this course, as well as backgrounds in visual design, industrial design, architecture, and video production. Above all, creative thinking with and through technology is the most important asset that students can bring to this course. In addition to various programming exercises, students will work in small groups on a major semester long project.

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 (i.e., do not just throw a pile of resource links on a page and expect us to figure it out). All elements must be clearly documented and accessible from your project page.

Projects:

**5. Learning Outcomes**

1. Employ techniques and technologies for programming and content creation for AR/MR experience in an AR browser, such as Argon.
2. Understand and apply appropriate principles and techniques for creating mobile AR/MR experiences.
3. Work in a team to realize a significant digital media design and prototypethat is a significant portfolio piece for you.

**6. Required Texts**

**Books**

R. Azuma, “A survey of augmented reality,” Presence-Teleoperators and Virtual Environments, 1997.

R. Azuma, “Recent advances in augmented reality,” Computer Graphics and Applications, IEEE, 2001.

B. MacIntyre et al. “The Argon AR Web Browser and Standards-Based AR Application Environment” IEEE ISMAR 2011.

E. Barba et al. “Here we are! Where are we? Locating Mixed Reality in The Age of the Smartphone”, to appear in the Journal of the IEEE, 2012.

Sherdoff, Nathan. “Experience Design”. Waite Group Press 2001.

Csikszentmihalyi, Mihaly. “Flow : The Psychology of Optimal Experience”. New York : Harper & Row, c1990.

Evan Barba and Blair MacIntyre. 2011. A scale model of mixed reality. In Proceedings of the 8th ACM conference on Creativity and cognition (C&C ’11). ACM, New York, NY, USA, 117-126.

**7. Graded Assignments**

The following is the breakdown of grading:

▪ Class participation: 5%

▪ Midterm: 10%

▪ Final: 10%

▪ Individual Assignments: 20% (15% assignments, 5% pitches and reports)

Project

▪ Group Pitch: 5%

▪ Group Design Milestone: 10% (5% presentation, 5% design)

▪ Alpha Milestone: 15% (5% presentation, 10% progress)

▪ Final Presentation and Deliverables: 25% (5% presentation, 8% technical implementation, 4% theoretical/critical/conceptual, 8% interaction and experience)

**8. Attendance Policy**

Attendance and punctuality are mandatory. An excused absence is one in which permission is requested in advance and you have a legitimate reason to skip class, such as an illness. You are expected to make up what you missed by checking with other students and reviewing lecture materials on the web site.

**9. Information for Students with Disabilities**

Please notify the instructor if you have any disabilities with which you need special assistance or consideration. The campus disability assistance program can be contacted through ADAPTS: <http://www.adapts.gatech.edu>

**10. Honor Code Statement**

Students are expected to adhere to the Georgia Tech Honor Code:

<http://www.honor.gatech.edu/plugins/content/index.php?id=9>

**11. Plagiarism Warning**

Plagiarism of any form will not be tolerated, and will result in a failing grade for the course.

**12. Course Schedule**

|  |  |  |
| --- | --- | --- |
| **Week #** |  | **Read /Project [Due]** |
| **Week 1** | Introduction/ AR and MR Overview  Short Javascript Assignment #1 |  |
| **Week 2** | Interaction Design Overview  Short Javascript Assignment #2  Mixed and Augmented Reality Overview; Intro to Argon  Argon Short Assignment #1 | Design SA #1 Due |
| **Week 3** | Mixed and Augmented Reality Overview; Intro to Argon; Argon Short Assignment #2  Discussion of possible project topics (SA #2 Due)  Team Building | Argon SA#1+2  Due |
| **Week 4** | Class Activity: Brainstorming  Concept and Content Development |  |
| **Week 5** | Argon coding | Progress Report #1:  5 minute presentations by students |
| **Week 6** | Design Methods |  |
| **Week 7** | Class work day: Feedback on methods selection and progress  Flow and Catharsis (two design aesthetics) |  |
| **Week 8** | Class work day | Progress report #2: Informal presentations (Methods selection and  progress; Prototype design and progress; Content development and progress) |
| **Week 9** | Video Documentation (Scenarios and Personas) |  |
| **Week 10** | Video Scenarios; Programming Argon 2 |  |
| **Week 11** | Break |  |
| **Week 12** | Reading and Discussion  Class work day |  |
| **Week 13** | Reading and Discussion  Class work day |  |
| **Week 14** | Reading and Discussion  MClass work day |  |
| **Week 15** | Programming Argon2  Class work day: preparation for Final Presentations |  |
| **Week 16** | Final Presentations | Final Presentations |