Instructor: Bernie Dodge, Ph.D.

Class Meeting Time & Place: Mondays at 4 pm, online via Blackboard Collaborate

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Office Hours: Mondays 2:30p – 3:30p and 5:30p to 6:30p. Other times by appointment.

Course Prerequisites: LDT 540 and LDT 544

Course Overview
Advanced design of multimedia learning environments using augmented and virtual reality as well as amplified perception. The uses and limitations of current technology and likely near-future developments. In Spring 2015, this course will be offered entirely online. It will not meet on campus. Outside of regular class time, there will be several optional opportunities for face-to-face hands-on experimentation.

Course Goals and Competencies
LDT 671 features performance outcomes that directly reflect the standards that underlie the LDT Master’s program. This page details each outcome and the cluster of competencies with which it is most closely associated.

On completion of LDT 671 you will be able to:

- Explain the differences and overlaps between augmented reality (AR), virtual reality (VR), amplified perception (AP) and virtual worlds in terms of their applicability for learning design. [Technical]
- Outline the ways in which technology can amplify our perceptions by tethering sensors, microscopes, telescopes and software defined radio to computers and tablets. [Technical]
- Describe available tools for creating educational experiences with virtual and augmented reality along with their advantages and disadvantages. [Systems]
- Identify critical attributes of a learning or performance problem that would justify the use of AR, AP or VR. [Systems]
- Plan, design and develop learning experiences using AR, AP and VR. [Processes]
- Apply principles derived from the psychology of perception and educational psychology to the design of an AR/AP/VR lesson. [Principles, Theories & Models]

Readings and Tools
There is no textbook for the course. Instead, online readings will be assigned as the course progresses. All will be posted on the weekly schedule on Blackboard. Most will also be available on our course Flipboard site as well.

Tools
The actual tools you will use will vary depending on the content and context of your project. It is likely that they will include a subset of the following:

- ARIS – A platform for creating place-based augmented reality experiences.
- Aurasma – Another platform for AR.
• **DAQRI 4D Studio** – Yet another way to overlay interactive virtual objects over a real-world trigger.
• **Theodolite** – an iOS app that overlays azimuth, elevation and location data on top of camera views.
• **Google Cardboard** – An elegant and cheap way to turn your smart phone into an immersive VR headset.
• **Google Photo Sphere** – A free tool for creating 360º immersive panoramas with a smart phone
• **iTelescope** – Use professional-level telescopes in the US, Spain and Australia to capture and analyze deep space objects.
• **Software Defined Radio** – Control a listening post in the Netherlands to capture signals that can be used to teach history, physics and social studies.

**Hardware**
It’s completely optional, but you may want to invest in a state of the art VR headset like **Oculus Rift**, **Sony Morpheus**, or **Samsung Gear**. Having this gear for yourself will give you direct experience of this new medium. Our focus will be on design, though, and you can get by with the $25 Google Cardboard. The field is changing so quickly that this list is very likely to change before the course is over.

**Course Assignments**
LDT 670 is organized around three major projects and a number of smaller activities. **Projects** have a specific timeframe within the course. **Activities** stretch across the whole semester:

**Project 1: Augmented Reality Lesson Design – 30%**
Using tools like **ARIS**, **Aurasma**, **DAQRI 4D Studio**, and **Theodolite** you will create a design document and lesson plan for specific learning outcomes, learners and contexts to the point at which the lesson is ready to implement.

**Project 2: Amplified Perception Lesson Design – 20%**
Using tools like **iTelescope**, **WebSDR** or a tethered microscope, you will create a design document and lesson plan for specific learning outcomes, learners and contexts.

**Project 3: Virtual Reality Lesson Design – 30%**
Using appropriate tools, you’ll create a design document and lesson plan for specific learning outcomes, learners and contexts.

**Activity 1: Semantic Wiki Contributions – 10%**
There are many concepts, technologies, companies and individuals involved in the fields covered by the course. Remembering what they are and how they’re related to each other is challenging but important. Who are the people involved in creating ARIS and what else are they doing? Who are the major vendors of VR headsets? What’s the relationship of LIDAR to VR? You will contribute 10 short descriptions of the entities within this domain and link them (e.g. ‘is a part of’, ‘is an example of’, ‘was developed by’) within a structured wiki. This wiki will serve as a useful reference both during and after the course.

**Activity 2: AR/VR Blog Contributions – 10%**
This field is evolving rapidly and keeping up with it takes a concerted effort. You will be responsible for posting three news items and your reactions to them to the course blog.
Grading
This is a graduate level course. According to our University’s Graduate Bulletin,

A means outstanding achievement; available for only the highest accomplishment;
B means praiseworthy performance; definitely above average;
C means average, awarded for satisfactory performance

For Students with Disabilities
If you are a student with a disability and believe you will need accommodations for this class, it is your responsibility to contact Student Disability Services at (619) 594-6473. To avoid any delay in the receipt of your accommodations, you should contact Student Disability Services as soon as possible. Please note that accommodations are not retroactive, and that accommodations based upon disability cannot be provided until you have presented your instructor with an accommodation letter from Student Disability Services. Your cooperation is appreciated.