Date: September 2017

Course Description:
This course inquires into critical issues surrounding making, tinkering, creating, and innovating in the classroom. In short, the course focuses on maker education as an effective way to understand and extend our praxis of technology education. It is designed as a project based course where students engage in the design of several maker projects through deliberate, sustained and systematic processes. Students will explore theories of maker education and collaborate in maker practices with a focus on creativity and exploration via critical making. Students are given opportunities to make, tinker, address challenges that arise through discussion and reflection, try out new or revised technological practices, and evaluate the results. Maker education, then, is a joyful collaborative process of teaching and learning found when we are all critically making together.

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Office: Scarfe 1224 (UBC)
WWW: http://blogs.ubc.ca/dandt/courses/edcp-377/

Valued Ends of the Course:
My intention is to help you develop a background and a depth of expertise for understanding and interpreting maker education, as well as utilizing digital methodologies in your educational praxis.

COURSE OBJECTIVES
Upon completion of this course, the student should have developed:
1. an understanding of maker education requiring inquiry, creativity, and engagement with complex situations, materials, and relationships — with colleagues, students, and the scholarly community.
2. an appreciation of the importance of research, design, and iterative making for the educational engagement of teaching and learning.
3. A discerning pedagogical praxis that is technologically mediated and valuable for the maker classroom.

Texts, Readings & Activities
As an education student and pre-service teacher, you are expected to prepare for class each week, which entails a variety of things including academic conversation, articulation, and presentation. Preparation is interdependent with participation for each module, which involves reading (highlighting, post-it note-taking, commenting & questioning in margin-notes, etc.), writing (posting to discussions, blogging, journaling, defining, framing, outlining, summarizing,
sketching, etc.), organizing (archiving, documenting, labeling, mindmapping, ordering, sequencing events, etc.), reflecting (rethinking, reincorporating, remapping, analyzing, ideating, synthesizing, etc.), and speaking (corresponding with peers, critiquing, debating, negotiating, podcasting, etc.). Read for meaning along with purpose.

ASSESSMENT AND MARKS / ASSIGNMENTS (see details below):

<table>
<thead>
<tr>
<th>Assignment</th>
<th>Due Date:</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Class participation</td>
<td>Ongoing</td>
<td>30%</td>
</tr>
<tr>
<td>2. Coding MIT app inventor project</td>
<td>December 8, 2017</td>
<td>35%</td>
</tr>
<tr>
<td>3. Making Media project</td>
<td>December 8, 2017</td>
<td>35%</td>
</tr>
</tbody>
</table>

Course Schedule

<table>
<thead>
<tr>
<th>DATE</th>
<th>MODULE</th>
<th>ASSIGNMENT</th>
<th>READINGS &amp; TOPICS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Class 1 Sept 8</td>
<td>Course Introduction</td>
<td>Participation, Preparation &amp; Readings</td>
<td>Course Syllabus, Mapping &amp; Definitions: Making, maker ed, STEM/STEAM, DIY</td>
</tr>
<tr>
<td>Class 3 Sept 22</td>
<td>Maker teaching and learning</td>
<td>Readings, intro coding project</td>
<td>Making as site of pedagogy: teaching and learning (Sator &amp; Bullock, 2017)</td>
</tr>
<tr>
<td>Class 4 Sept 29</td>
<td>Space, tools, and materials</td>
<td>Readings, intro making media project</td>
<td>Making in the schools (Wardrip &amp; Brahms, 2015)</td>
</tr>
<tr>
<td>Class 5 Oct 6</td>
<td>Play, creativity, gamification</td>
<td>Readings, coding work in class</td>
<td>Making as play (Herro &amp; Clark, 2016; Nicholson, 2012)</td>
</tr>
<tr>
<td>Class 6 Oct 13</td>
<td>Project presentation</td>
<td>Coding pitch due</td>
<td>Making and Coding Education (Kanbul, 2017)</td>
</tr>
<tr>
<td>Oct 20</td>
<td>Professional Development Day – class cancelled</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Class 7 Oct 27</td>
<td>PBL, badges, portfolios, etc</td>
<td>Readings, explore modes of assessment</td>
<td>Assessing and documenting maker ed (Flores, 2016)</td>
</tr>
<tr>
<td>Class 8 Nov 3</td>
<td>Digital supports, social media</td>
<td>Readings, discuss online possibilities</td>
<td>Making online (Rafalow, 2015)</td>
</tr>
<tr>
<td>Class 9</td>
<td>Critical</td>
<td>Readings,</td>
<td>What is critical making?</td>
</tr>
<tr>
<td>Date</td>
<td>Topic</td>
<td>Activities</td>
<td>References</td>
</tr>
<tr>
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<tr>
<td>Nov 10</td>
<td>making</td>
<td>looking beyond the classroom</td>
<td>(Ratto, 2011, CBC article)</td>
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<tr>
<td>Nov 17, 24</td>
<td><strong>2 week School-based Orientation Practicum</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Class 10 Dec 1</td>
<td>Case studies, review</td>
<td>Readings, project work in class</td>
<td><strong>Making meaning</strong> (NYHS, 2013)</td>
</tr>
<tr>
<td>Class 11 Dec 8</td>
<td>Course Synthesis</td>
<td><strong>media project Presentations</strong></td>
<td>Celebration of Learning</td>
</tr>
</tbody>
</table>

**Class 1**

**Maker Education Introduction**

**Readings / Media**

**Resources**
- The tinkering studio - https://tinkering.exploratorium.edu/

**Class 2**

**Histories, Philosophies, and Practices of Maker Education**

**Readings**

**Resources**
- Maker Education Resource library - http://makered.org/resources/
- Young Makers Professional Development - http://makered.org/youngmakers/training-resources-support/prof-dvlp/
Class 3

Making as site of pedagogy

Readings / Media

Gaming Resources
   a. Virtonomics, a business game - [https://virtonomics.com/](https://virtonomics.com/)
   b. Kahoot - [https://kahoot.it/#/](https://kahoot.it/#/)

Class 4

Making in the schools

Readings

Making Media Resources:

Media Production Resources
   i. FilmSkills [http://www.filmskills.com](http://www.filmskills.com)

k. Resources at NFB Education [https://www.nfb.ca/education/guides/]

l. American Film Institute

m. Royalty Free Music for Schools [http://www.soundzabound.com/]

Class 5
Making as play

Readings / Media


Media Education & Literacy Resources
   c. Legends of learning - [https://www.legendsoflearning.com/research/](https://www.legendsoflearning.com/research/)
   d. UBC Emerging Media Lab - [http://eml.ubc.ca/](http://eml.ubc.ca/)

Class 6
Making and Coding Education

Readings / Media

Media Education & Literacy Resources
   a. Minecraft education - [https://education.minecraft.net/](https://education.minecraft.net/)
   b. MIT app inventor - [http://appinventor.mit.edu/explore/](http://appinventor.mit.edu/explore/)
   d. Coding Games and Programming - [https://www.codingame.com/](https://www.codingame.com/)

Class 7
Assessing and documenting maker education

Readings / Media
Resources
a. Open badges - https://openbadges.org/

Class 8
Making online

Readings / Media

Resources
b. WIRED documentary – Shenzhen: The Silicon Valley of Hardware’ - https://www.youtube.com/watch?v=SGJ5cZnoodY

Class 9
What is critical making?

Readings / Media

Resources
a. Matt Ratto @ TEDxUofT, ‘Without a leg to stand on – 3D printing prosthetics’ - https://www.youtube.com/watch?v=LNohpJntZo
b. Chris Anderson, From Maker Movement to Industrial Revolution – http://www.youtube.com/watch?v=i03GLcn_ceE

Class 10
Making meaning

Readings / Media

Resources
a. Edutopia resources for maker education - https://www.edutopia.org/article/maker-education-resources
c. UBC School of Architecture - https://sala.ubc.ca/resources/workshop-fabrication/laser-cutters

d. UBC engineering prototyping tools - http://projectlab.engphys.ubc.ca/prototyping/

Participation (Ongoing) (30%)

Participation is valued at 30% of your final grade. Participation is interdependent with preparation for each class, which involves reading (highlighting, pagination post-its, margin notes, comments & questions, etc.), writing and speaking (discussing, corresponding with peers, chat, etc.), and commenting on classmates’ in-class and digital work. Challenges also are expected to be completed and participated in on their due dates; presentations and assignments should be polished, creative, unique, and informative.

<table>
<thead>
<tr>
<th>Participation (30%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low----Avg---------High</td>
</tr>
<tr>
<td>Appropriately and accurately prepares and participates in readings discussions, reflection, etc.</td>
</tr>
<tr>
<td>F------------------------P</td>
</tr>
<tr>
<td>Level of participation in activities and group work is high quality and professional, etc.</td>
</tr>
<tr>
<td>F------------------------P</td>
</tr>
<tr>
<td>Demonstrate curiosity, enthusiasm, and in-depth inquiry into weekly explorations of maker curriculum and pedagogy.</td>
</tr>
<tr>
<td>F------------------------P</td>
</tr>
<tr>
<td>Total: F / P</td>
</tr>
</tbody>
</table>

Coding MIT app inventor project [DUE: Dec 8, 2017] (35%)

In groups of 2, use app inventor (http://appinventor.mit.edu/explore/) to pitch an idea for an app and design it to be useful in your classroom. The pitch should be a proper 5 minute presentation (using visuals, audio, presentation technologies, etc.) to the class on October 13. Your classmates and the instructor will give you feedback for your initial pitch. Afterwards, you will have class time to work on the assignment with a final 5 minute presentation reveal of your app due December 8.

The project should be a comprehensive, working app. Additionally, the user experience (UX) and user interface (UI) should be designed well, and will be graded according to the rubric listed below.
Making Media Project [Due: December 8, 2017] (35%)

Create a 5 minute video tutorial (or small series of lessons), in combination with Augmented Reality (AR) technologies, to instruct students on specific design and technology class challenges (e.g., assembly, design, programming, etc.). The topic must follow the following qualities:

a) Addresses a challenging procedure. Use screen capture software, CamStudio (CamStudio or Camtasia can be downloaded free through UBC Connect [http://elearning.ubc.ca/connect/]). Students are also advised to download VideoScribe from Connect. Use screen capture in conjunction with presentation or publishing software such as Publisher or InDesign OR web technologies (Wix, Wordpress, Wikia, Weebly, etc.) to create a professional quality tutorial/unit plan.

b) The lesson incorporates AR software, use Aurasma ([https://www.aurasma.com/](https://www.aurasma.com/)), Layar ([https://www.layar.com/](https://www.layar.com/)), or other AR software to uniquely connect your video tutorial lesson to a physical object, material, or location in your classroom.

c) Appropriate, appealing, and relevant to students at either the grades 8-10 or 11-12 levels.

d) Relates to and connects the unit/tutorials’ learning objectives with either the BC IRPs and PLOs.

The tutorial should include the following elements:

a. **Title/Introduction**: Introduce your tutorial and its learning outcomes.

b. **Procedural Challenge**: What challenge does procedure describe and resolve?

c. **Image, Text & Sound**: Write effective text and insert appropriate images or reference sound files to provide a fully descriptive procedure.
d. **Focus Points**: Provide steps that allow for pause and challenge the students to think through decision trees.

e. **Next steps**: Include next logical steps for the students to pursue after completing the procedure described in the tutorial.

f. **Professional Format**: Uses a variety of digital technologies (interactivity, audio, visual) for tutorial design which are presented through a polished and professional format.

<table>
<thead>
<tr>
<th>Making Media Project (35%)</th>
<th>Low</th>
<th>Avg</th>
<th>High</th>
</tr>
</thead>
<tbody>
<tr>
<td>Clarity of communication, and professional formatting</td>
<td>F</td>
<td>P</td>
<td></td>
</tr>
<tr>
<td>Creative use of audio, video, animation, etc.</td>
<td>F</td>
<td>P</td>
<td></td>
</tr>
<tr>
<td>Development and logical flow of procedures</td>
<td>F</td>
<td>P</td>
<td></td>
</tr>
<tr>
<td>Effective and creative use of Augmented Reality software</td>
<td>F</td>
<td>P</td>
<td></td>
</tr>
<tr>
<td>AR use and video tutorial work seamlessly together</td>
<td>F</td>
<td>P</td>
<td></td>
</tr>
</tbody>
</table>

**Total**: F / P