CD 145 / ED 182: Technological Tools for Playful Learning

Spring, 2020

Tuesday 9-11:30am

Curriculum Lab at the Eliot-Pearson Department of Child Study and Human Development

Prof. Marina Bers

Marina.Bers@tufts.edu

TA: Dr. Ziva Hassenfeld

Ziva.Hassenfeld@tufts.edu

1-617-627-4490

COURSE DESCRIPTION

This course explores the design and use of new technologies for learning. The underlying philosophy of this course is "constructionism", which states that people learn better when engaged in making and designing their own computational meaningful projects; therefore, we will become designers of technological tools and curriculum to be used in educational setting, and, we will become researchers to assess the thinking and learning fostered by the different tools.

COURSE REQUIREMENTS

Readings and class participation (On-going—10% of grade): All students are expected to do the readings, and to participate in discussions in class. When readings are linked from the syllabus, it is strongly suggested that students print them out and have them available in a folder to bring to class. This class involves hands on-learning in real-world settings; therefore students must be present. There is a required text that is available from the Tufts bookstore, on-line or in the library: Bers, M (2018) Coding as a playground: programming and computational thinking and in the early childhood classroom, Routledge.

Class presentations (On-going—10% of grade): Class time will be organized as discussions, not lectures. To help get discussions started, for each session, a student will be asked to summarize the readings and suggest one question or provocative issue.

Development of a ScratchJr collaborative activity (February 18, 10% of grade). In small groups students will develop a three-hour activity using ScratchJr in a collaborative way that includes both on-screen and off-screen experiences. Later, they will implement their unit in a real early childhood classroom and will document the learning. They will email the proposed activity to Prof. Bers by February 18.

Classroom implementation of a ScratchJr collaborative activity (Feb 25 and March 3, 10% of grade). In small groups, students will implement their three-hour activity in an early childhood classroom and will document the experience through pictures and/or video.
**Documentation of ScratchJr collaborative activity (March 10, 10% of grade)** Individually, each student will create either a PowerPoint, or a video or a website to show the process of making the collaborative ScratchJr activity in the classroom. Students can choose a focal student or idea to create their documentation.

**Development of a robotics curriculum unit (March 15, 10% of grade).** In small groups students will develop a three-hour curriculum to teach robotics using a literacy-based approach. Later, they will implement their unit in a real early childhood classroom and will document the learning. They will email the curriculum unit to Prof. Bers by March 15.

**Classroom implementation of a robotics curriculum unit (March 24 and 31, 10% of grade).** In small groups, students will implement their three-hour curriculum in an early childhood classroom to teach robotics using a literacy-based approach.

**Final project: Documentation of a literacy-based robotics curriculum unit (April 14—15% of grade).** In small groups, students will document the learning experience and will present their work to the class by creating a short video that tells the story of what happened (less than three minutes).

**Final in-class essay (April 23- 15% of grade):** Students will work individually on an in-class essay to respond to the question: “How did this class promote my own understanding of coding as literacy?” The essay will bring together every aspect of the course, including the theoretical readings, classrooms experiences and discussions. It can be written with access to all class materials. More information about the specifics will be handed out in class during that day.

### January 21: Introduction and Course Overview

| Stager, G (2016) *Seymour Papert*
| Design Studio | Prof. Bers’ presentation
| Class activity with the four paradigms
| Papert’s video

### January 28: Coding as a literacy

We will discuss the concept of coding as a literacy of the XXI century and the notion of computational thinking. In class, we will be doing an exercise based on the different parts and chapters of the book.
Readings for Class

Bers, M (2018) *Coding as a playground: programming and computational thinking and in the early childhood classroom*, Routledge. Part I, Chapters 1, 2 and 3; Part II Chapters 5, 6 and 7

Vee, A. Understanding computer programming as literacy (http://www.licsjournal.org/OJS/index.php/LiCS/article/view/24/26)


Design Studio

In class exercise based on the different readings

February 4: Dances around the world: Programming robots in Kindergarten

In this session students will have a hands-on experience with the KIBO robot developed by the DevTech research group.

Readings for Class

Ready for Robotics website


Design Studio

Students will work on dancing robots with KIBO, document their dances and submit them

February 11: Programming with ScratchJr and computational thinking


https://www.nostarch.com/scratchjr

*INTRODUCTION:


“A Different Approach to Coding” by Mitch Resnick and David Siegel (https://brightthemag.com/a-different-approach-to-coding-d679b06d83a)
In class we will make ScratchJr projects.

### February 18: Powerful Ideas from Computer Science

<table>
<thead>
<tr>
<th>Design Studio</th>
<th>Students will choose at least two powerful ideas of Computer Science described in Prof. Bers book (chapter 6) and will develop a collaborative ScratchJr project that engages people in exploring them.</th>
</tr>
</thead>
</table>

| Readings for Class | MA Digital literacy curriculum standards  
|-------------------| K2 CS frameworks: [https://k12cs.org/pre-k/](https://k12cs.org/pre-k/)  
|                   | 2016 Massachusetts Science and Technology/Engineering Curriculum Framework |

| Assignment Due | ScratchJr collaborative activity. Use these guidelines |

### February 25: Visit to classroom I (EPCS): ScratchJr activity 10:15-11

| Design Studio | Classroom implementation of ScratchJr collaborative activity. |

### March 3: Visit to classroom II (EPCS): ScratchJr activity 10:15-11

| Design Studio | Classroom implementation of ScratchJr collaborative activity. |

### March 10: Debriefing and Developing KIBO curriculum

| Design Studio | Students will work in groups developing their curriculum projects and assessments. The goal is to integrate the teaching of KIBO and coding as a literacy. |

| Readings for class | Curriculum templates  
<table>
<thead>
<tr>
<th>Date</th>
<th>Event</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>March 15:</td>
<td>Assignment Due: Robotics curriculum unit (small groups).</td>
<td></td>
</tr>
<tr>
<td>March 17:</td>
<td>Spring break</td>
<td></td>
</tr>
<tr>
<td>March 24:</td>
<td>Visit to Classroom I (Kindergarten at JCDS): 9:30-11</td>
<td>Design studio: Classroom implementation of robotics curriculum unit.</td>
</tr>
<tr>
<td>March 31:</td>
<td>Visit to Classroom II (Kindergarten at JCDS): 9:30-11</td>
<td>Design studio: Classroom implementation of robotics curriculum unit.</td>
</tr>
<tr>
<td>April 7:</td>
<td>Positive Technological Development</td>
<td>Design Studio: Students will work in groups evaluating different technologies using the PTD card game and checklist.</td>
</tr>
<tr>
<td></td>
<td>Readings for class</td>
<td>Bers, M (2018) <em>Coding as a playground: programming and computational thinking and in the early childhood classroom</em>, Routledge. Part II Chapter 8</td>
</tr>
<tr>
<td>April 14:</td>
<td>Final presentations of projects</td>
<td>Assignment due: Final project: Documentation of a literacy-based robotics curriculum unit (video presentation).</td>
</tr>
<tr>
<td>April 23:</td>
<td>Final in-class essay</td>
<td>In class assignment: Students will work individually on an in-class essay to respond to the question: “How did this class promote my own understanding of coding as literacy?”. The essay will bring together every aspect of the course, including the theoretical readings, classrooms experiences and</td>
</tr>
</tbody>
</table>
discussions. It can be written with access to all class materials. More information about the specifics will be handed out in class during that day.