

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

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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

<p>Readings for Class</p>	<p>Koschmann, T. D. (1996). Paradigm shifts and instructional technology: An introduction. In T. D. Koschmann (Ed.), <i>CSCL: Theory and practice of an emerging paradigm</i> (pp. 1-24). NJ: Lawrence Erlbaum.</p> <p>Papert, S. (1999, March 29). Papert on Piaget. Time Magazine, special issue on "The Century's Greatest Minds,"105</p> <p>Stager, G (2016) Seymour Papert</p>
<p>Design Studio</p>	<p>Prof. Bers' presentation</p> <p>Class activity with the four paradigms</p> <p>Papert's video</p>

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	<p>Bers, M (2018) <i>Coding as a playground: programming and computational thinking and in the early childhood classroom</i>, Routledge. Part I, Chapters 1,2 and 3); Part II Chapters 5, 6 and 7</p> <p>Vee, A. Understanding computer programming as literacy (http://www.licsjournal.org/OJS/index.php/LiCS/article/view/24/26)</p> <p>Ong, W. “Writing Is A Technology That Restructures Thought” in <i>The written word</i> (https://www.scribd.com/document/36156900/Writing-is-a-Technology-That-Restructures-Thought-PDF-by-Walter-J-Ong)</p>
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	<p>Ready for Robotics website</p> <p>Bers, M. U. (2019). Coding as another language: a pedagogical approach for teaching computer science in early childhood. <i>Journal of Computers in Education</i>, 1-30.</p>
Design Studio	Students will work on dancing robots with KIBO, document their dances and submit them

February 11: Programming with ScratchJr and computational thinking

Readings for Class	<p>Bers, M.U. & Resnick, M. (2015). <i>The Official ScratchJr Book</i>. San Francisco, CA: No Starch Press. https://www.nostarch.com/scratchjr <i>INTRODUCTION:</i> https://www.nostarch.com/download/samples/OfficialScratchJrBook_sampleIntroandCh1.pdf</p> <p>Wing, J (2006) “Computational Thinking” (http://www.cs.cmu.edu/~wing/publications/Wing06.pdf)</p> <p>“Computational Thinking: I Do Not Think It Means What You Think It Means” by Lorena Barba (https://medium.com/@lorenaabarba/computational-thinking-i-do-not-think-it-means-what-you-think-it-means-6d39e854fa90#.rzgc28lbn)</p> <p>“A Different Approach to Coding” by Mitch Resnick and David Siegel (https://brightthemag.com/a-different-approach-to-coding-d679b06d83a)</p>
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	Scratch Jr. website
Design Studio	In class we will make ScratchJr projects.

February 18: Powerful Ideas from Computer Science

Design Studio	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.
Readings for Class	MA Digital literacy curriculum standards K2 CS frameworks: 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.
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March 3: Visit to classroom II (EPCS): ScratchJr activity 10:15-11

Design Studio	Classroom implementation of ScratchJr collaborative activity.
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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 Hassenfeld, Z.R. & Bers, M.U. (2019). Debugging the Writing Process: Lessons From a Comparison of Students' Coding and Writing Practices . <i>The Reading Teacher</i> .

Assignment due	Documentation of ScratchJr collaborative activity (individually).
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March 15:

Assignment Due	Robotics curriculum unit (small groups).
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March 17: Spring break

March 24: Visit to Classroom I (Kindergarten at JCDS): 9:30-11

Design studio	Classroom implementation of robotics curriculum unit.
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March 31: Visit to Classroom II (Kindergarten at JCDS): 9:30-11

Design studio	Classroom implementation of robotics curriculum unit.
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April 7: Positive Technological Development

Design Studio	Students will work in groups evaluating different technologies using the PTD card game and checklist.
Readings for class	Bers, M (2018) <i>Coding as a playground: programming and computational thinking and in the early childhood classroom</i> , Routledge. Part II Chapter 8

April 14 Final presentations of projects

Assignment due	Final project: Documentation of a literacy-based robotics curriculum unit (video presentation).
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April 23: Final in-class essay

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
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	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.
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