

CD 145 / ED 182

**Technological Tools for Learning**

**Spring, 2016**

Tuesday 9-11:30am

Location:

Curriculum Lab at the Eliot-Pearson Department of Child Development

**Prof. Marina Bers**

[Marina.Bers@tufts.edu](mailto:Marina.Bers@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 to be used in education and we will become researchers to assess the thinking and learning fostered by the different tools. We will also explore current research and debates regarding educational technologies.

**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. Most readings will be linked from the syllabus. It is strongly suggested that students print them out and have them available in a folder to bring to class.

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

**Coding project (Due February 23 --20% of grade).** Individually students will develop a project using ScratchJrand will present it during class.

**Development of a robotics curriculum unit (March 24—15% of grade).**In small groups students will develop a three-hour curriculum to teach robotics. They will present their proposals to the class for discussion on March 24. Later, they will implement their unit in a classroom and will document the learning.

**Classroom implementation of a robotics curriculum unit.(March 31 and April 7 --15% of grade).**In small groups students will implement their three-hour curriculum to teach robotics.

**Documentation of a robotics curriculum unit. (April 21—30% of grade).** In small groups students will document the learning experience and will present their work to the class. The documentation project will include two elements: 1) a short video (less than one minute); 2) a Powerpoint or equivalent) presentation that tells the story of what happened using text, pictures and video by focusing on a particular aspect of the experience.

**January 26: Programming robots in Kindergarten**

In this session students will have a hands-on experience with the [KIBO](#) robot developed by the DevTech research group

**February 2: Introduction and Course Overview**

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| <b>Readings for Class</b> | <p>Koschmann, T. D. (1996). <a href="#">Paradigm shifts and instructional technology: An introduction.</a> 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). <a href="#">Papert on Piaget.</a> Time Magazine, special issue on "The Century's Greatest Minds," 105</p> |
| <b>Design Studio</b>      | <p>Marina's presentation</p> <p>Class activity with the four paradigms</p> <p>Papert's video</p>  |

**February 9: Dances around the world**

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| <b>Readings for Class</b> | <p><a href="#">Ready for Robotics website</a></p>     |
| <b>Design Studio</b>      | <p>Students will work on dancing robots with KIBO</p> |

**February 16: Learning Programming with Scratch Jr (Kaitlyn)**

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| <b>Readings for Class</b> | <p>Flannery, L.P., Kazakoff, E.R., Bontá, P., Silverman, B., Bers, M.U., and Resnick, M. (2013). <a href="#">Designing Scratch Jr: Support for early childhood learning through computer programming.</a> In Proceedings of the 12th International Conference on Interaction Design and Children (IDC '13). ACM, New York, NY, USA, 1-10. DOI=10.1145/2485760.2485785</p> <p><a href="#">Scratch Jr. website</a></p> |
| <b>Design Studio</b>      | <p>Scratch Jr projects</p>   |

**February 23: Presentations of Coding projects**

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| <b>Design Studio</b> | Students will share their ScartchJr project |
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**March 1: Visit to classroom I (kindergarten): Iditarod**

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| <b>Design Studio</b> | Iditarod project in first grade |
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**March 8: Visit to classroom II (kindergarten):: Iditarod**

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| <b>Design Studio</b> | Iditarod project in first grade |
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**March 15: Curriculum development**

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| <b>Design Studio</b>      | Students will work in groups developing their curriculum projects and testing them out |
| <b>Readings for class</b> | <a href="#">Curriculum templates</a>   |

**March 29: Visit to Classroom I (first grade): Curriculum implementation**

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| <b>Design studio</b> | Robotics project |
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**April 5: Visit to Classroom II (first grade): Curriculum implementation**

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| <b>Design Studio</b> | Robotics project |
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**April 12: Computational literacy and technological fluency**

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| <b>Readings for Class</b> | <a href="#">Technological Fluency</a><br><a href="#">Technological Literacy</a> standards (ITEA International Technology Education Association)<br><a href="#">Massachusetts Curriculum Frameworks for Science and Technology / Engineering</a><br><a href="#">Massachusetts Digital Learning Annual Report 2014-2015</a> |
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|                             | <p><a href="#">National Education Technology Plan</a>, Dept. of Education: Office of Educational Technology</p> <p><a href="#">NETS (National Educational Technology Standards) Project</a>, ISTE (International Society for Technology in Education)</p> <p><b>Articles</b></p> <p>Chau, L. (2015). <a href="#">Digital Skills Urgently Needed to Bridge Digital Literacy Gap</a>. <i>Huffington Post</i>.</p> <p>Munoz, C., Smith, M. (2015). <a href="#">As Computer Science Education Week ("CS Ed Week") Approaches: Calling all CS Learning Champions!</a><i>White House blog</i>.<br/>(URL: <a href="https://www.whitehouse.gov/blog/2015/11/25/computer-science-education-week-cs-ed-week-approaches-calling-all-cs-learning-0">https://www.whitehouse.gov/blog/2015/11/25/computer-science-education-week-cs-ed-week-approaches-calling-all-cs-learning-0</a>)</p> <p>Yongpradit, P. (2015). <a href="#">Messages and Misconceptions of Computer Science Education</a>. <i>Huffington Post</i>.</p> |
| <p><b>Design Studio</b></p> | <p>Students will compare and contrast the ways in which the different documents define what it means to be computer literate.</p>  |

**April 19: Current debates on Educational Technologies**

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| <p><b>Readings for Class</b></p> | <p>Cuban, L <a href="#">So much high-tech money invested, so little use: how come?</a></p> <p>Wartella, E. A., &amp; Jennings, N. (2000).<a href="#">Children and Computers: New Technology-Old Concerns</a>. <i>The Future of Children: Children and Computer Technology</i>, 10(2).</p> <p>Papert, S. (1987). <a href="#">Computer criticism vs. technocentric thinking</a>. <i>Educational Researcher</i>, 16(1), 22-30.</p> <p>West, D. (2015). <a href="#">Connected Learning: How mobile technology can improve education</a>.<i>Brookings Center for Technology Innovation</i>.</p> <p><b>Articles</b></p> <p>Nield, D. (2015). <a href="#">Is technology in the classroom good for children?</a><i>The Guardian</i>.</p> <p>Kesling, B. (2015). <a href="#">Technology in Classrooms Doesn't Always Boost Education Results, OECD Says</a>. <i>The Wall Street Journal</i>.</p> <p>Paul, A.M. (2014). <a href="#">The Body Learns</a>. <i>Slate</i>.</p> <p>Cohen, A. (2015). <a href="#">The Ever-Growing Ed-Tech Market</a>. <i>The Atlantic</i></p> |
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| <b>Design studio</b> | News articles<br>In-class debate |
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**April 26: Final presentations of robotic projects**

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| <b>Assignment due</b> | Final video and Powerpoint (or equivalent) presentations |
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