**BOROUGH OF MANHATTAN COMMUNITY COLLEGE**

City University of New York

**Teacher Education Department**

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| **Title of Course:**<br>EDU 210: Introduction to Computational Thinking & Instructional Technology I<br>EDU 211: Introduction to Computational Thinking & Instructional Technology II | Class hours: 2<br>Lab hours: 2 |
| **Semester:** Summer 2023<br>May 31-August 9, 2023 | **Instructor Information:**<br>Name: Jen Longley<br>Office: S-616C<br>Office hours: W & Th 8-9 PM (Zoom)<br>Phone: 917-318-3133 cell<br>Email: jlongley@bmcc.cuny.edu |
| **Day/Time:** Wednesday 6 PM-8 PM on Zoom<br>https://bmcc-cuny.zoom.us/j/7550991402<br>Meeting ID: 755 099 1402 1(929) 205-6099 | |
| **Credits:** 4 | |

**Course Descriptions** Introduction to Computational Thinking and Instructional Technology I: This course examines the use of and issues surrounding educational technology. The content will focus on computational thinking; computer-related technology; digital literacy; Universal Design of Learning (UDL); supporting learners with various learning styles/needs to use technology; and the application of these concepts into educational settings. This course will equip educational professionals with a wide range of resources, models, methods, and techniques for integrating these topics and skills into their classrooms using evidence-based pedagogy to facilitate all students' learning. Hands-on experience with a variety of low-tech and high-tech instructional technologies will be embedded throughout the course.

Introduction to Computational Thinking and Instructional Technology II: This course continues to examine the use of and issues surrounding computational thinking and educational technology. The content will focus on computational thinking; computer-related technology; digital literacy; Universal Design of Learning (UDL); supporting learners with various learning styles/needs to use technology; abstraction, decomposition, algorithms, and patterns as elements of compositional thinking; and the application of these concepts into educational settings. This course will equip educational professionals with a wide range of resources, models, methods, and techniques for integrating these topics and skills into their classrooms using evidence-based pedagogy to facilitate all students' learning. Hands-on experience with a variety of low-tech and high-tech instructional technologies will be embedded throughout the course.

ECE 110-Lecture Mission Statement: The mission of EDU 210/211 is to: 1) create a learning community that embraces and supports all members, 2) expands members' knowledge related to the following components of computational thinking, and instructional and educational technology; 3) develop a critical lens to identify which technological resources, when, and how to implement them in Pre-K to grade 6 classrooms.

**Course Format**

Our class is blended online -- asynchronous and synchronous. We will meet synchronously on Zoom once a week on Wednesday 6-8 PM, and you will complete work for EDU 210-211 asynchronously, independently on-line on your own time. The link for our Zoom sessions is: https://bmcc-

cuny.zoom.us/j/7550991402 Meeting ID: 755 099 1402, 1(929) 205-6099. *Because EDU 210-211 is a summer class, please plan to spend 10 hours each week on EDU 210-211, in addition to class meetings, papers, and projects.*

Our course is housed on BMCC's OpenLab. OpenLab is a web-based platform using WordPress that is an alternative to a traditional learning management system, such as Blackboard. All course materials and activities will occur on BMCC's OpenLab. Join BMCC's OpenLab by logging on (https://openlab.bmcc.cuny.edu/) and creating a profile. After you are a member of OpenLab, join our learning community at (https://openlab.bmcc.cuny.edu/edu-210211-summer-2023-j-longley/)

**STUDENT LEARNING OUTCOMES:**

| **ECE 110 students will be able to:** | **Measurements (means of assessment for student learning outcomes listed in first column)** |
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| 1. Describe computational thinking and its components | Discussion Forum; Class activities; Computational Thinking Activity |
| 2. Identify, select, and utilize accessibility features and assistive technology | Discussion Forums; Choice Activity; Class activities |
| 3. Embed elements of digital fluency into lessons across the curriculum | Discussion Forums; Choice Activity; Class activities |
| 4. Incorporate technology that supports learning effectively into a classroom's daily routines and learning experiences | Discussion Forums; Choice Activity; Class activities: Computational Thinking Activity |
| 5. Analyze and assess the quality, accessibility, security, and appropriateness of specific technology applications to be used in a classroom | Discussion Forums; Choice Activity; Class activities |
| 6. Create appropriate instructional opportunities that meet the needs of all learners using technology/computational thinking | Discussion Forums; Choice Activity; Class activities; Computational Thinking Activity |

Below are the college's general education learning outcomes, the outcomes that are checked in the left-hand column indicate goals that will be covered and assessed in this course.

| | **BMCC General Education Goals:** (Checked goals indicate college-wide goals that will be covered and assessed in ECE 110.) | **Measurements (means of assessment for general education goals listed in first column)** |
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| **X** | **1. Communication Skills-** Students will write, read, listen and speak critically and effectively. | Participation; Discussion Forum; Presentation |
| | **2. Quantitative Reasoning-** Students will use quantitative skills and the concepts and methods of mathematics to solve problems. | |
| | **3. Scientific Reasoning-** Students will understand and apply the concepts and methods of the natural sciences. | |

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| | **4. Social and Behavioral Sciences-** Students will understand and apply the concepts and methods of the social sciences. | Observation Summaries, Commentary Paper, Group Project |
| | **5. Arts & Humanities-** Students will develop knowledge and understanding of the arts and literature. | |
| **x** | **6. Information & Technology Literacy-** Students will collect, evaluate and interpret information and effectively use information technologies. | Choice Activity; Class Activities; Discussion Forums; Computational Thinking Activity |
| **x** | **7. Values-** Students will make informed choices based on an understanding of personal values, human diversity, multicultural awareness and social responsibility. | Discussion Forums, Class Activities, Class Participation; Reflection Paper |

**Teacher Education Department Student Professionalism Policy Statement:**
If you have not already received and signed the Professional Policy Statement, you will receive and be asked to sign it. The policy is summarized here: The Teacher Education Department of Borough of Manhattan Community College requires that all students conduct themselves in a professional manner during class, site visits, internships, course related activities and interactions with members of the Teacher Education Department and college community. The Teacher Education Department defines professional behavior in alignment with the National Association for the Education of Young Children (NAEYC) Code of Ethics (NAEYC, 2005). By reading and signing a copy of the Teacher Education Student Professionalism Policy, you agree to abide by these policies and understand the ramifications of failure to abide by these policies. If you have any questions concerning this policy, please contact me or a faculty member of the Teacher Education Department.

BMCC is committed to the health and well-being of all students. It is common for everyone to seek assistance at some point in their life, and there are free and confidential services on campus that can help.

**Single Stop** www.bmcc.cuny.edu/singlestop room S230, 212-220-8195. If you are having problems with food or housing insecurity, finances, health insurance or anything else that might get in the way of your studies at BMCC, come by the Single Stop Office for advice and assistance. Assistance is also available through the Office of Student Affairs, S350, 212-220- 8130.

**Counseling Center** www.bmcc.cuny.edu/counseling room S343, 212-220-8140. Counselors assist students in addressing psychological and adjustment issues (i.e., depression, anxiety, and relationships) and can help with stress, time management and more. Counselors are available for walk-in visits.

**Office of Compliance and Diversity** www.bmcc cuny.edu/aac room S701, 212-220-1236. BMCC is committed to promoting a diverse and inclusive learning environment free of unlawful discrimination/harassment, including sexual harassment, where all students are treated fairly. For information about BMCC's policies and resources, or to request additional assistance in this area, please visit or call the office, or email olevy@bmcc.cuny.edu, or twade@bmcc.cuny.edu. If you need immediate assistance, please contact BMCC Public safety at 212-220-8080.

**Office of Accessibility** www.bmcc.cuny.edu/accessibility, room N360 (accessible entrance: 77 Harrison Street), 212-220-8180. This office collaborates with students who have documented

disabilities, to coordinate support services, reasonable accommodations, and programs that enable equal access to education and college life. To request an accommodation due to a documented disability, please visit or call the office.

**Gender-Inclusivity**
BMCC community members have the right to use and be referred to according to their preferred name, title, and/or personal pronouns. Everyone also has the right to use all spaces according to their self-identification, including restrooms and locker rooms. To learn more about how to change your preferred name and affirm your gender identity at CUNY (including requesting a new ID card and/or email address), go here: https://www.bmcc.cuny.edu/student-affairs/lgbtq/ Anyone who has experienced harassment related to gender or sexual identification, who needs assistance, or who wishes to file a complaint, can contact the Office of Compliance and Diversity: https://www.bmcc.cuny.edu/about-bmcc/compliance-diversity/.

**BMCC Policy on Plagiarism and Academic Integrity Statement**
Plagiarism is the presentation of someone else's ideas, words or artistic, scientific, or technical work as one's own creation. Using the idea or work of another is permissible only when the original author is identified. Paraphrasing and summarizing, as well as direct quotations, require citations to the original source. Plagiarism may be intentional or unintentional. Lack of dishonest intent does not necessarily absolve a student of responsibility for plagiarism. Students who are unsure how and when to provide documentation are advised to consult with their instructors. The library has guides designed to help students to appropriately identify a cited work. The full policy can be found on BMCC's Web site, www.bmcc.cuny.edu. For further information on integrity and behavior, please consult the college bulletin (also available online).

**Class Participation**
Participation in the academic activity of each course is a significant component of the learning process and plays a major role in determining overall student academic achievement. Academic activities may include, but are not limited to, attending class, submitting assignments, engaging in in-class or online activities, taking exams, and/or participating in group work. Each instructor has the right to establish their own class participation policy, and it is each student's responsibility to be familiar with and follow the participation policies for each course.

**Required Text & Readings:**
1. The course is a Zero Textbook Cost (ZTC) using Open Educational Resources (OER).
2. Assigned course readings and materials are housed on BMCC's OpenLab.
3. Please read/review assigned material before class and be prepared to discuss the content when we meet

**Technological Requirements to Successfully Participate in ECE 110-Lecture**

| TOOL | WHO TO CONTACT IF YOU HAVE A PROBLEM ACCESSING |
|---|---|
| A device (desktop, laptop, tablet, etc.) with internet/Wi-Fi connectivity | BMCC Student Affairs Office studentaffairs@bmcc.cuny.edu in the subject line the problem you are experiencing (e.g. Need a Computer, Need Internet) |
| Blackboard, OpenLab and Zoom | BMCC e-Learning Center (S-510A), 212/ 220-1243, elearning@bmcc.cuny.edu |
| BMCC email CUNY First account | BMCC Service Desk (S-141), 212/ 220-8379 servicedesk@bmcc.cuny.edu |

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| Other tech issues | |
| BMCC Library Video Databases | BMCC Library https://bmcc.libguides.com/az.php?t=35954 |
| Portfolio | Jen; BMCC e-Learning Center (S-510A), 212/ 220-1243, elearning@bmcc.cuny.edu; https://openlab.bmcc.cuny.edu/blog/help/how-to-create-your-early-childhood-ed-required-portfolio-ece-majors-only/ |
| Google Docs & Jamboard | Jen; https://www.google.com/docs/about/; https://jamboard.google.com/ |
| Hypothesis | Jen; https://web.hypothes.is/ |
| Remind | Jen; https://www.remind.com/ |
| Slido | Jen; https://www.sli.do/ |
| You Tube | Jen; https://www.youtube.com/ |
| FlipGrid | Jen; https://info.flip.com/en-us.html |
| Scratch | Jen; https://scratch.mit.edu |
| Padlet | Jen; https://padlet.com |

**EVALUATION AND COURSEWORK REQUIREMENTS:**

Coursework Requirements:

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| Participation | 1 point |
| Discussion forums (1 forum per week/module) | 1 point |
| Reflections Paper | 1 point |
| Activity (select 1) | 1 point |
| Digital Footprints | |
| Adding Technology | |
| Evaluating Technology | |
| Computational Thinking Activity | 1 point |
| Creating Activity | |
| Sharing Activity | |
| TOTAL | 5 points |

How Grades Are Determined

| Grade | Earned Points |
|---|---|
| A | 93 – 100 (5 points) |
| A- | 90 - 92 |
| B+ | 87 - 89 |
| B | 83 – 87 (4 points) |
| B- | 80 - 82 |
| C+ | 77 - 79 |
| C | 73 – 76 (3 points) |
| C- | 70 - 72 |
| D+ | 67 - 69 |
| D | 63 – 67 (2 points) |
| D- | 60 - 62 |
| F | Below 60 (0-1 points) |

**Communicating with Me (Jen)**

My office hours will be held on Zoom Wednesday and Thursday 8-9 PM. Use this link to join my office hours: https://bmcc-cuny.zoom.us/j/7550991402 Meeting ID: 755 099 1402 1(929) 205-6099

My goal is to support your success! In addition to my office hours, I am available:

1) on my cell phone at 917/318-3133, for voice call, text, What's App, and/or FaceTime;
2) by email at jlongley@bmcc.cuny.edu;
3) on the Remind app (remind.com/join/c2d44f) please find instructions on how to join the Remind app on Open Lab, in the "About this Class" menu item under "Remind App".

I typically respond to emails or messages within 12 hours, so if I have not responded to you within 12 hours, please reach out again. I aim to provide feedback on student work within 7 days after it has been submitted.

***I want you to be successful – in EDU 210/211, but more importantly in life! If any issue is preventing you from fully demonstrating your abilities or participating in our learning community, please contact me as soon as possible! We will work together to facilitate your success.***

## Outline of Topics: *(subject to change):*

| WEEK | MODULE | READINGS/ MATERIALS | ASSIGNMENT | TOPICS |
|---|---|---|---|---|
| **5/31**-6/6 at 11:59 PM | Module 1: Introductions | Santo et al., (2019)<br><br>CT Values Card Games<br><br>Padlet examples of people's digital lives<br><br>CITE Framework | Discussion Forum: Introductions<br><br>Learning Community Agreements<br><br>Reflections Paper | Syllabus<br><br>OpenLab |
| **6/7**-6/13 at 11:59 PM | Module 2: Digital Citizenship | Burns & Gottschalk (2019)<br><br>Digital Citizenship: https://www.aeseducation.com/blog/what-is-digital-citizenship<br><br>https://www.commonsense.org/education/articles/teaching-digital-citizenship-to-kids-with-learning-and-attention-issues<br><br>https://ny.pbslearningmedia.org/resource/digital-citizenship-video/things-explained/<br><br>https://www.oecd.org/education/ceri/21st-Century-Children-as-Digital-Citizens.pdf<br><br>James et al. (2019)<br>Walters et al., (2019)<br><br>*Young Children and Digital Footprints*<br><br>Digital Divide: http://www.digitaldividecouncil.com/what-is-the-digital-divide/<br><br>Evaluating websites https://libguides.snhu.edu/c.php?g=92303&p=2104208<br><br>https://www.edutopia.org/article/teaching-students-evaluate-websites | Discussion Forum: Digital Citzenship<br><br>https://libguides.snhu.edu/c.php?g=92303&p=2104213 | Evaluating websites<br><br>Exploring Digital footprints<br><br>Digital Divide<br><br>Supporting digital citizenship in students |
| **6/14**-6/20 | Module 3: Instructional Technology | https://www.commonsense.org/education/articles/teachers-essential-guide-to-teaching-with-technology | Discussion Post: Technology<br><br>Technological Learning Self-Assessment | What is instructional technology?<br><br>Elements of instructional Ed |

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| | | https://www.brookings.edu/essay/realizing-the-promise-how-can-education-technology-improve-learning-for-all/<br><br>https://www.edutopia.org/technology-integration-guide-implementation<br><br>Bruyckere et al., (2016)<br>Egbert, J. (2017)<br>Norton & Sprauge (2002)<br>Norton & Wiburg (2001)<br><br>https://www.commonsense.org/education/articles/offline-and-off-screen-activities-for-minds-on-learning<br><br>https://www.edutopia.org/diy-professional-development-resources<br><br>https://www.prodigygame.com/main-en/blog/25-easy-ways-to-use-technology-in-the-classroom--downloadable-list/<br><br>https://www.edutopia.org/article/effective-uses-technology-elementary-school/<br><br>https://www.technologyreview.com/2019/12/19/131155/classroom-technology-holding-students-back-edtech-kids-education/<br><br>https://inclusiveclassrooms.org/resources/teacher-inquiries/integrating-technology-in-the-classroom<br><br>Selected Examples of Effective Classroom Practice Involving Technology Tools and Interactive Media (NAEYC, 2012) | | technology in action<br><br>How ed tech support learning<br><br>Integrating ed tech into lessons<br><br>High tech vs low tech |
| **6/21**-6/27 | Module 4: Supporting all Learners | Carpenter et at., (2015)<br>Hung & Ding (2020)<br>Hung & Ding (2020) a<br>Ok & Rao (2019)<br>Papadakis, S. (2021)<br>Trust, T. (2020)<br><br>https://www.commonsense.org/education/articles/3-steps-to-a- | Discussion Forum: Accessibility<br><br>Analyze websites<br><br>FlipGrid | Accessability<br><br>What is UDL?<br><br>UDL & tech<br><br>MLL & tech<br><br>FlipGrid |

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| | | more-accessible-classroom<br><br>https://schoolvirtually.org/technology-and-udl/<br><br>https://media.un.org/en/asset/k1t/k1t0k5i4sm<br><br>https://www.nea.org/professional-excellence/student-engagement/tools-tips/how-use-technology-engage-multilingual<br><br>https://edtechbooks.org/digitaltoolsapps/evaluatingaccessibility<br>https://www.iste.org/explore/professional-development/tips-making-documents-accessible-all-students | | Analyzing tech for accessibility |
| **6/28**-7/4 | Module 5: Introduction to Computational Thinking | Edwards & Cassidy (2021)<br>Hunsaker (2020)<br>Kjällander, et al., (2021)<br>Ottenbreit-Leftwich & Yadav (2021)<br><br>https://www.edutopia.org/blog/computational-thinking-across-the-curriculum-eli-sheldon<br><br>https://www.iste.org/explore/computer-science/teach-coding-and-computational-thinking-elementary-students<br><br>Hunsaker (2020)<br><br>https://www.robowunderkind.com/blog/what-is-computational-thinking<br><br>https://www.youtube.com/watch?v=Da5TOXCwLSg&t=3s<br><br>https://people.cs.vt.edu/~kafura/CS6604/Papers/CT-What-And-Why.pdf<br><br>Edwards & Cassidy (2021)<br>Hunsaker (2020)<br>Kjällander, et al., (2021)<br>Ottenbreit-Leftwich & Yadav (2021) | Discussion Forum: Computational Thinking in Life<br><br>Choice Activity | What is computational thinking?<br><br>Why computational thinking is important<br><br>Identifying computational thinking |

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| **7/5**-7/11 | Module 6: Decomposition | Deitz et al., (2019)<br>Krauss & Prottsman (2016)<br>Rich et al. (2019)<br><br>https://www.remc.org/21Things4Students/21/21-computational-thinking/q2-decomposition/<br><br>https://teachinglondoncomputing.org/resources/developing-computational-thinking/decomposition/<br><br>https://www.learning.com/blog/why-is-decomposition-required-in-computational-thinking/<br><br>https://www.youtube.com/watch?v=yQVTijX437c<br><br>https://www.iste.org/explore/computational-thinking/understanding-problems-computational-thinking-decomposition<br><br>https://medium.com/tech-based-teaching/breaking-down-thinking-a-brief-intro-to-decomposition-5ba0a8749fe7 | Discussion Forum: Decomposition<br><br>Presentations<br>Portfolio Sharing | Decomposition Activity<br><br>Decomposition in Action<br><br>Decomposition in:<br>ELA<br>Math<br>Science<br>Social Studies<br>SEL |
| **7/12**-7/18 | Module 7: Patterns | Calderon et al., (2015)<br><br>Cansu & Cansu (2019)<br><br>Miller (2019)<br><br>https://www.readingrockets.org/article/patterns-and-categorizing<br><br>https://www.learning.com/blog/pattern-recognition-in-computational-thinking/<br><br>https://equip.learning.com/pattern-recognition-computational-thinking/<br><br>https://medium.com/turing-ninjas/pattern-recognition-a-key-skill-for-computational-thinking-a8218bf3c3ae<br><br>https://www.bbc.co.uk/bitesize/guides/zxxbgk7/revision/1 | https://sites.google.com/isabc.ca/computationalthinking/pattern-recognition<br><br>https://www.remc.org/21Things4Students/21/21-computational-thinking/q3-patterns/<br><br>Discussion Forum: Patterns<br><br>Pattern Activity | Pattern Activity<br><br>Patterns in Action<br><br>Patterns in:<br>ELA<br>Math<br>Science<br>Social Studies<br>SEL |

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| **7/19**-7/25 | Module 8: Abstraction | Cetin & Dubinsky. (2017)<br>Ezeamuzie et al., (2022)<br>Silva et al (2021)<br>Rijke et al (2018)<br><br>https://www.learning.com/blog/abstraction-in-computational-thinking/<br><br>https://equip.learning.com/abstraction-computational-thinking/<br><br>https://www.remc.org/21Things4Students/21/21-computational-thinking/q4-abstraction/<br><br>https://www.youtube.com/watch?v=jV-7Hy-PF2Q<br><br>https://sites.google.com/a/sfusd.edu/cs-in-sf-mycs-for-teachers/computational-thinking-resources/unit-0/0-6-computational-thinking-abstraction | https://knorth.edublogs.org/content/algorithmic-thinking/abstraction/<br><br>Discussion Forum: Abstraction<br><br>Abstraction Activity | Abstraction Activity<br><br>Abstraction in Action<br><br>Abstraction in:<br>ELA<br>Math<br>Science<br>Social Studies<br>SEL |
| **7/26**-8/1 | Module 9: Algorithms | Mezak et al (2021)<br>Moschella, M. (2019)<br>Wong & Jiang (2018)<br><br>https://digitalpromise.org/initiative/computational-thinking/computational-thinking-for-next-generation-science/creating-algorithms/<br><br>https://www.codemonkey.com/blog/how-to-explain-algorithms-to-kids/<br><br>https://everydaymath.uchicago.edu/about/research-results/algorithms.pdf<br><br>https://www.canadalearningcode.ca/lessons/baking-with-algorithms/<br><br>https://www.inspiritscholars.com/blog/what-is-an-algorithm-for-kids/<br>https://www.teachermagazine.com/sea_en/articles/integrating-algorithm-tasks-into-early-years-teaching | https://code.org/curriculum/course2/2/Teacher<br><br>https://teachyourkidscode.com/egg-carton-unplugged-coding-activity/<br><br>Discussion Forum:<br><br>Algorithms Activity | Algorithms Activity<br><br>Algorithms in Action<br><br>Algorithms in:<br>ELA<br>Math<br>Science<br>Social Studies<br>SEL |

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| 10<br>**8/2**-8/7 | Module 10: Applying Computational Thinking | Campana et al. (2020)<br>Hill & Brunvand (2020)<br>Lee et al (2023)<br>Lu & Sherman (2020)<br>Moore & Ottenbreit-Leftwich (2020)<br>Ottenbreit & Yadav (2021) Eds.<br>Smith (2020)<br>Su & Yang (2023)<br><br>https://www.gettingsmart.com/2018/03/09/computational-thinking-elementary-classroom/<br><br>https://www.edutopia.org/article/screen-free-computational-thinking/<br><br>https://www.iste.org/explore/computational-thinking<br><br>https://www.gettingsmart.com/2018/03/18/early-learning-strategies-for-developing-computational-thinking-skills/<br><br>Ottenbreit & Yadav (2021) Eds. | Discussion Forum: Applying Computation Thinking<br><br>Computational Thinking in Action | Applying Computational Thinking Activity<br><br>Computational Thinking in Action<br><br>Computational Thinking in:<br>ELA<br>Math<br>Science<br>Social Studies<br>SEL |
| **8/9** | Module 11: Reflecting, Planning Ahead | | Discussion Forum: Reflections<br><br>ALL WORK FOR DUE | Presentations<br><br>Portfolio Sharing |

Other Resources:
In addition to the websites listed below, in the course schedule, the following suggested readings and resources may be used in the course:

Suggested Readings/ Resources

Burns, T. & Gottschalk, F. eds. (2019). *Educating 21st Century Children: Emotional Well-Being in the Digital Age.* Educational Research and Innovation, OECD Publishing, Paris, https://doi.org/10.1787/b7f33425-en

Calderon, A., Crick, T. & Tryfona, C. (2015). Developing computational thinking through pattern recognition in early years education. Proceedings of the 2015 British HCI Conference, (pp. 259-260). Lincoln, UK: ACM. http://dx.doi.org/10.1145/2783446.2783600

Campana, K., Haines, C.; Kociubuk, J. & Langsam, P. (2020). Making the connection: Computational thinking and early learning for young children and their families. *Public Libraries, 59(*4), 44-56.

Cansu, F. K., & Cansu, S. K. (2019). An Overview of Computational Thinking. *International Journal of Computer Science Education in Schools*, *3*(1), 17–30. https://doi.org/10.21585/ijcses.v3i1.53

Carpenter, L. B., Johnston, L. B., & Beard, L. A., (2015). *Assistive Technology: Access for All Students (3rd edition)*. Pearson Education, Inc. Upper Saddle River, NJ.

Cetin, I., & Dubinsky, E. (2017). Reflective abstraction in computational thinking. *The Journal of Mathematical Behavior*, *47*, 70-80.

De Bruyckere, P., Kirschner, P. A., & Hulshof, C.D. (2016). Technology in education: What teachers should know. *American Educator*, 12-18 & 43.

Dietz, G. Landay, J. A., & Gweon, H. (2019) Building blocks of computational thinking: Young children's developing capacities for problem decomposition. *Cognitive Science*, 1647-1653

Edwards, T. & Cassidy, M. (2021). Exploring Computational Thinking. TERC, Cambridge, MA. https://blog.terc.edu/what-is-computational-thinking

Egbert, J. (2017). *Methods of Education Technology: Principles, Practice, and Tools*. PressBooks https://opentext.wsu.edu/tchlrn445/

Ezeamuzie, N. O., Leung, J. S. C., & Ting, F. S. T. (2022). Unleashing the potential of abstraction from cloud of computational thinking: A systematic review of literature. *Journal of Educational Computing Research, 60*(4), 877–905. https://doi.org/10.1177/07356331211055379

James, C., Weinstein, E., & Mendoza, K. (2019). *Teaching digital citizens in today's world: Research and insights behind the Common Sense K–12 Digital Citizenship Curriculum*. San Francisco, CA: Common Sense Media.

Kjällander,S., Mannila,L., Åkerfeldt, A., & Heintz, F. (2021). Elementary students' first approach to computational thinking and programming. *Education Sciences 11*, 80. https://doi.org/10.3390/educsci11020080

Krauss, J. & Prottsman K. (2016). *Computational thinking {and coding} for every student.* New York: Corwin.

Mezak, J., Vujicic, L & Jancec, L. (July 2021) Development of algorithmic thinking skills in early and preschool education. 13th International Conference on Education and New Learning Technologies Proceedings, 8152-8161

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# ASSIGNMENT GUIDELINES

ECE 210/211 focus on embedding instructional technology, educational technology, and computational thinking into PreK-6 grade classrooms. The assignments and assessment procedures for ECE 110-Lecture are listed below:

| ASSIGNMENT | POINTS | DUE BY AT 11:59 PM | PAGE |
|---|---|---|---|
| Participation | 1 point | Throughout course & 8/9 | 8-9 |
| Discussion Forums | 1 point | Every week/module | 9 |
| Reflection Paper | 1 point | 6/6 | 10-11 |
| Activity (select 1) | 1 point | 6/28 | 11 |
| a. Digital Footprints | | | |
| b. Adding Technology | | | |
| c. Evaluating Technology | | | |
| Computational Thinking Activity (2 parts) | 1 point | 8/9 | 11-12 |
| 1. Creating Activity | | | |
| 2. Sharing Activity | | | |

## PARTICIPATION

Purpose: The purpose of participation in synchronous sessions is to:

- Increase the opportunities to co-create knowledge with peers/colleagues
- Provide an opportunity to reflect on your contribution to our learning community
- Instill accountability for learning and community among all participants

Task: Throughout the course, monitor your participation in our learning community using the self-assessment below. At the end of the semester you will formally assess your participation in our learning community.

Steps: Follow these steps to assess your participation in our learning community:

1. Review the self-assessment checklist
2. Identify your strengths as a participant in our learning community and opportunities for growth
3. During each learning community session, strive to meet the tasks on the checklist
4. At the end of the course, you will complete the Learning Community Participation Self-Assessment

5. Answer the questions on the bottom of the Self-Assessment, explaining why you placed yourself in each column for each task.
6. Submit the completed handout on Blackboard

Participating in EDU 210/211 fosters community, promotes co-creating knowledge with others, and deepens your engagement with the course material. EDU 210/211 class participation involves contributing to in-class activities. The Self-Assessment Checklist below describes how class participation will be assessed at the end of the course.

**Self-Assessment Checklist**, if you can answer 'yes' to all questions below, you will earn 1 point:

| TASK | DID YOU: | Y/N |
|---|---|---|
| ENGAGEMENT | Actively participate & engage in class activities & discussions? | |
| MEMBER OF CLASS | Collaborates with all colleagues & supports the success of all members? | |
| PREPAREDNESS | Prepare for learning community sessions -- read & have copy of assigned reading(s), materials for class, etc.? | |
| ASSIGNMENTS | Complete assignments thoroughly & timely? | |

## DISCUSSION FORUMS

Purpose: The purpose of discussion forums is to:

- Introduce you to a wide variety of perspectives on a topic
- Foster community in the course
- Engage in reflection and dialogue on course content

Task: Each module/week a question will be posed that connects to the content from the module, your experience and insights; you will be asked to reply to colleague's post also

Steps: Follow these steps to participate in discussion forums:

1. Review the materials in the module on OpenLab and the prompts for the discussion forum post.
2. Click the link to post your discussion forum post.
3. Develop a response that is:
    a. 250+ words in length
    b. References materials from the module
    c. Substantiative, enhances the discussion and move the discussion forward
4. Review the prompts to respond to colleagues posts

Discussion forums provide you with the opportunity to reflect on, share your insights, and engage in dialogue with colleagues on the materials you have reviewed in the module. Participating in the discussion forum involves reviewing the material in the module, answering the questions posted, and responding to a colleague. The Self-Assessment Checklist below describes how discussion forum posts will be assessed.

**Self-Assessment Checklist**, if you can answer 'yes' to all questions below, you will earn 1 point:

| TASK | DOES YOUR POST: | Y/N |
|---|---|---|
| COMMENT | Substantively answer the questions in 250 words+ that expand & extend the discussion by introducing new insights, experiences, viewpoints, arguments, &/or questions? | |
| SUPPORTING INFORMATION | Reference & integrate information from the module into the response? | |

| | | |
|---|---|---|
| REPLY TO COLLEAGUES | Connect to your colleague's original comment, move the discussion forward, embed content from the module? | |
| CLARITY | Present in an organized, coherent format that shows evidence of proofreading? | |

**REFLECTIONS PAPER**

*~3 pages, double-spaced, typewritten, standard 1" margins, 12 point font*

Purpose: The purpose of the Reflections is to for you to:

- Begin to explore how your experiences with and messages you received about technology impact your attitudes towards technology
- Identify your values on technology in education

Task**:** In this paper, reflect upon and describe your experiences with technology.

Steps: Begin the process of constructing your paper by reflecting on the prompts; reviewing Santo et al., 2019; the Padlet examples from people digital lives, and the CT Values Card Game. Your paper should include the following 5 sections:

Section 1 -- Introduction

- Start the paper with your earliest memory of technology
- Describe what happened in detail. When was it? Where? How old were you?
- What were your thoughts, feelings, reactions, and responses?

Section 2 -- Early Experiences:

- Explain the interactions and experiences you had with technology as a child and teenager:
    - Describe your experiences with technology inside of school/ educational settings
    - Share your experiences with technology inside of school/ educational settings
    - Include your thoughts, feelings, reactions, and responses
    - If you had no/ limited interactions/ experiences with technology, why?
- Describe, reflect up and analyze the messages you received growing about technology from your:
    - Family
    - Cultural community

Section 3 -- Adult Experiences

- Explain the interactions you have with technology as an adult:
    - Describe your personal experiences with technology
    - Share your professional experiences with technology
    - Include your thoughts, feelings, reactions, and responses
    - If you had no/ limited interactions with technology, why?
- Describe, reflect up and analyze the messages you received as an adult about technology from your:
        - Family
        - Cultural community
        - Work community
        - Society

Section 4 --Values

- After reviewing the materials in the module (CT Values Card Game; Santo, et al., 2019; Padlet examples from people digital lives)
    - What cards did you keep at the end of the game? Why?
    - How would you identify/ classify your values?
    - What connections can you make to between the values you reviewed and the examples from people's digital lives?

The Self-Assessment Checklist below describes how the Reflections Paper will be assessed.

**Self-Assessment Checklist**, if you can answer 'yes' to all questions below, you will earn 1 point:

| ELEMENT | DOES YOUR PAPER INCLUDE: | Y/N |
|---|---|---|
| PAST EXPERIENCES: | Detailed, rich, vivid account & description of your first memories & past experiences with technology? | |
| MESSAGES | Thoughtful reflection of the messages you received from your family & communities about technology? | |
| CURRENT EXPERIENCES | Detailed, rich, description of your current experiences with technology? | |
| VALUES | Identify your values about technology supported with clear & detailed explanation & thoughtful reflections | |
| CLARITY | A clear, organized, coherent format; full of examples; and, show evidence of proofreading? | |

## CHOICE ASSIGNMENT

Select one of the following assignments to complete. Your responses can be written, graphics, audio, video recordings, or digital representations (Scratch).

1. Digital Footprints

Read "Young Children and Digital Footprints". Answer the questions that follow. A new video will be provided.

2. Adding Technology to an Instructional Opportunity

Identify an instructional opportunity you engaged in with children that could be improved by technology. Add low-tech and high-tech to the instructional opportunity then share it with children. Answer the questions:

a. Describing the Learning Experience
   i. Describe the instructional activity (before you added technology)
   ii. What are the student learning outcomes?
   iii. How will you measure the learning outcomes?
b. Reflections on Adding Technology
   i. How do you think the student learning outcomes can be better achieved with technology?
   ii. Why do you think the student learning experience can be improved by adding technology?
   iii. Describe the technology (low-tech & high-tech) are you adding to the activity? Why did you select that technology?
   iv. How do you know that the technology is accessible to the students?
c. Reflect on the outcome of the learning experience.
   i. Did the students achieve the learning outcomes? How do you know?
   ii. What was successful about the learning experience?
   iii. What worked well with the technology you used?
   iv. What will you do differently the next time you implement the learning experience?
   v. What worked well with the technology you used?

**3.** Evaluating Technology & Apps

a. Engage in the activities to assess technology for accessibility for each step of the POUR process. Share your results. https://edtechbooks.org/digitaltoolsapps/evaluatingaccessibility

## COMPUTATIONAL THINKING ACTIVITY

Purpose: The purpose of the Computational Thinking Activity is to:

- Apply what you have learned in EDU 210/211
- Develop an activity/ learning experience you can use with children

- Integrate computational thinking into your work with children

Task: To create an activity that you can use with children that embeds computational thinking skills
Steps: Follow these steps to assess your participation in our learning community:

1. Reflect on your work with children and when/ how/ where you can embed computational thinking/ elements of computational thinking into your work
2. Review examples of activities that integrate computational thinking/ elements of computational thinking
3. Brainstorm an activity/ activities that align with your work with young children and integrates computational thinking
4. Ensure you have included the 4 elements of computational thinking in your activity/activities
5. Think of how you will share the activity with your peers

This activity has 2 parts.

1. Developing an Activity
2. Sharing your Activity

**Developing an Activity**
Create a learning experience(s) that you can use with your students which embeds computational thinking. The experience(s) should:

1. be an activity you can use with your students
2. include all components of computational thinking – abstraction, algorithms, decomposition, and patterns
3. list the learning outcomes & how they will be measured
4. identify the materials students needed for the activity
5. describe the steps of the activity/ experience in detail
6. you can develop 1 learning experience, or more, but if multiple activities are planned they should be linked/connected
7. The format to submit your learning experience can be a paper, video, graphic, digital, etc.

**Presenting Activities**
After creating the activities, you will share them with peers in class.

The Self-Assessment Checklist below describes how your Computational Thinking Activity will be assessed at the end of the course.

**Self-Assessment Checklist**, if you can answer 'yes' to all questions below, you will earn 1 point:

| TASK | DOES THE LEARNING ACTIVITY: | Y/N |
|---|---|---|
| ACTIVITY | Be shared with your students in your role/ work? | |
| LEARNING OUTCOMES | Describe learning outcomes and how they will be assessed? | |
| RESOURCES | Include the materials & steps for the learning activity? | |
| ELEMENTS OF COMPUTATIONAL THINKING | Include all components of computational thinking into the activity– abstraction, algorithms, decomposition, and patterns? | |
| SHARING | Share the activity with other members of the learning community in a clear, coherent, manner? | |