Molloy University
GRADUATE EDUCATION

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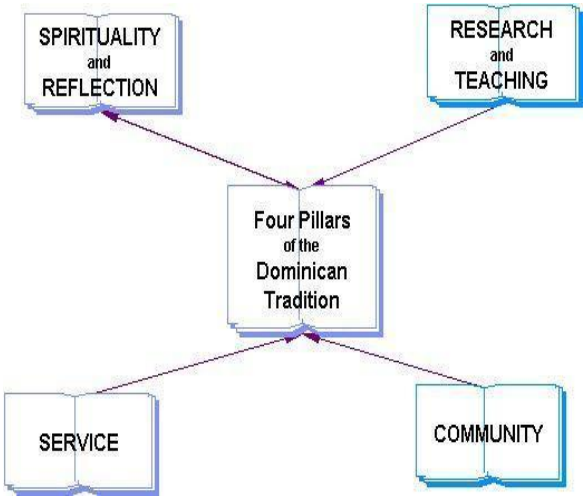
EDU 5900.59
Course Title: Coding in the Elementary Classroom: Foundations with Scratch Jr, Microbits, and more.

Course Description:

This fully online, asynchronous course empowers educators to integrate coding simulations into elementary classrooms, using tools like Scratch Jr, Micro.bits, and other beginner-friendly coding platforms. Designed for flexible learning, the course allows teachers to explore coding concepts and develop engaging, age-appropriate lessons at their own pace. Through guided activities and practical assignments, participants will learn how to foster creativity, problem-solving, and computational thinking in young students. By course completion, educators will be ready to create interactive, STEM-centered classroom experiences that introduce coding in an accessible and exciting way, aligned with the NYS computer science and digital fluency standards.

3 credits

Shared Vision



The Molloy College Teacher Education faculty has derived its vision for the exemplary teacher from the College's mission statement, the four pillars of the Dominican tradition, comments and input from the Professional Education Unit's Advisory Board and degree candidates as well as numerous faculty discussions rooted in the department's knowledge base which undergirds the initial and advanced programs' curriculum, pedagogy, and values

The teaching professionals who complete Molloy's teacher preparation programs are distinguished by their ability to exemplify and promote core values in their own teaching. These values include:

Belief that all children can learn
Learner centered and value-centered curriculum and pedagogy
Ethics and spirituality
Intellectual curiosity
Independence and risk taking, while promoting collective identity and responsibility
Diversity, multiculturalism and pluralism, including divergent thinking
Passion for teaching
Commitment to students and their communities
Civic responsibility through the promotion of social justice and interdependence
Commitment to democracy

COURSE OBJECTIVES

STUDENT LEARNING OUTCOMES

Teacher candidates will be able to do the following:

1. Identify and explain basic coding concepts suitable for elementary students.

2. Explore and use beginner-friendly coding platforms such as Scratch Jr and Micro:bits.

3. Create age-appropriate coding lessons that support creativity, problem-solving, and computational thinking.

4. Design classroom activities that align with the NYS Computer Science and Digital Fluency Standards.

LEARNING COMMUNITY STRATEGIES

Throughout the course, opportunities for discussion, reflection, writing, and analysis will be required to help tie theory and research to situations in schools today.

SUGGESTED READINGS AND OTHER SELECT RESOURCES SUCH AS WEBSITES

1. Rayan, B., Daher, W., Diab, H., & Issa, N. (2023). Integrating PhET simulations into elementary science education: A qualitative analysis. *Education Sciences, 13*(9), 884. https://doi.org/10.3390/educsci13090884MDPI+2MDPI+2MDPI+2

2. Wang, C., Shen, J., & Chao, J. (2021). Integrating computational thinking in STEM education: A literature review. *International Journal of Science and Mathematics Education, 19*(5), 1–24.

https://doi.org/10.1007/s10763-020-10131-0NSF Public Access+1NSF Public Access+1

3. Ghosh, A., Malva, L., Gotovos, A., Hooshyar, D., & Singla, A. (2024). Exploring the impact of quizzes interleaved with write-code tasks in elementary-level visual programming. *arXiv preprint arXiv:2411.14275*. https://arxiv.org/abs/2411.14275

Grading Criteria:

1. Coding Platform Exploration & Reflection – 20%

Description:
Participants will explore Scratch Jr, Micro:bits, and one additional beginner-friendly coding platform (e.g., Code.org or Tynker). They will write a short reflection (1-2 pages) comparing features and how each platform supports elementary learners.
Objective(s) Addressed: 1, 2

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2. Lesson Plan Design – 35%

Description:
Educators will design a complete age-appropriate coding lesson that incorporates creativity, problem-solving, and computational thinking. The lesson must include objectives, procedures, student activities, and assessment strategies.
Objective(s) Addressed: 2, 3, 4

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3. Standards Alignment Activity – 20%

Description:
Participants will review the NYS Computer Science and Digital Fluency Standards and align a chosen coding activity (existing or self-made) to at least two appropriate standards. A short explanation must be included.
Objective(s) Addressed: 4

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4. Final Project: Classroom Coding Simulation – 25%

Description:
Teachers will develop and present a classroom-ready interactive coding activity using one of the explored platforms. They must include a video or slideshow walkthrough,

student-facing materials, and a brief teacher guide.
Objective(s) Addressed: 1, 2, 3, 4

Academic Integrity Statement:

The college maintains and affirms a strong policy of academic honesty. Every member of the
academic community has a duty neither to cheat nor to condone cheating, fabrication, plagiarism,
or facilitation of academic dishonesty. Academic infractions are subject to disciplinary
action as described in the Graduate Education Student Handbook and the Molloy College
Graduate Handbook and Calendar.

Plagiarism is claiming the words, ideas, concepts, outlines, handouts, and drafts of works-in-
progress of another as your own without giving credit where it is due. As a component of
academic integrity, plagiarism is prohibited at Molloy College. To prevent even the suggestion
of plagiarism, quotation marks must be used to indicate the exact words of another author.
Additionally, each time you paraphrase another author [*i.e.,* summarize a passage or rearrange
the order of a sentence and change some of the words], you will need to credit the source in your
text.

Adapted from Principle 6.22 of the *Publication Manual of the American Psychological Association* (6th ed.).

Attendance Policy:

Since the classroom experience consists of an exchange of ideas and discussion which cannot be repeated, students are expected to attend all classes punctually and regularly. Attendance and class participation represent 10% of a student's final grade in all graduate education courses. Students who are absent more than THREE times during the course of a semester will be assigned an Incomplete grade until the missed

time and work is completed. It is the student's responsibility to contact the professor if there are any problems.

As stated in the Molloy College Catalogue:

The grade of "I" is earned in a course when the student has not completed all course requirements. It is a substitute grade given only with the approval of the instructor and Graduate Program Director at the specific request of the student prior to the end of the course. Approval is granted only when the student demonstrates circumstances beyond his/her control, which temporarily prevents completion of the course work. All incompletes must be resolved by the dates indicated in the Academic Calendar for each semester. Any extension beyond the published dates of the Academic Calendar requires written approval of both the instructor and the Director of the Graduate Program.

Any grade of "I" which is not converted to a letter grade within the time allotted, automatically becomes an "F."

Disabilities Statement

Candidates with documented disabilities who believe they may need accommodations in this class are encouraged to contact the Director of the Disabilities Support Service Office. The contact and telephone number is 323-3315.

E-MAIL Policy:

It is mandatory that every candidate have a Molloy College e-mail account and check it daily. Information re: the programs as well as communication from course professors utilize this media. This Molloy e-mail account must be activated immediately. If not utilized within 30 days, the account becomes defunct and needs to be reinstated.

E-Portfolio Account:

All Molloy teacher candidates **must purchase an e-portfolio by registering in EDU 501E so that benchmarks** may be submitted electronically through e-portfolio as part of our assessment system. Teacher candidates must keep an up-to-date portfolio, which will be used during each advisement session.

Information Literacy Statement

Information literacy is a set of abilities requiring individuals to "recognize when information is needed and have the ability to locate, evaluate, and use effectively the needed information."

Information literacy also is increasingly important in the contemporary environment of rapid technological change and proliferating information resources. Because of the escalating complexity of this environment, individuals are faced with diverse, abundant

information choices--in their academic studies, in the workplace, and in their personal lives. Information is available through libraries, community resources, special interest organizations, media, and the Internet--and increasingly, information comes to individuals in unfiltered formats, raising questions about its authenticity, validity, and reliability. In addition, information is available through multiple media, including graphical, aural, and textual, and these pose new challenges for individuals in evaluating and understanding it. The uncertain quality and expanding quantity of information pose large challenges for society. The sheer abundance of information will not in itself create a more informed citizenry without a complementary cluster of abilities necessary to use information effectively.

Information literacy forms the basis for lifelong learning. It is common to all disciplines, to all learning environments, and to all levels of education. It enables learners to master content and extend their investigations, become more self-directed, and assume greater control over their own learning.

Workshop Policy:

Attendance At Professional Workshops And Conferences: Participation in professional workshops and conferences is an integral part of being a well-informed teacher. All teacher candidates are required to attend one Molloy College sponsored workshop/conference each semester. These conferences are presented by Nassau Reading Council, Phi Delta Kappa, Molloy Chapter of Kappa Delta Pi, etc.

Workshops and Conferences which teachers are required to attend as part of their teaching contractual obligations (such as Superintendent's Conference Days and district sponsored conferences) may not be considered to fulfill this Molloy College Professional Workshop/Conference requirement. Workshops in Training in the Identification and Reporting of Child Abuse and Neglect, Principles of Chemical Dependency and School Violence Prevention and Intervention required by New York State Education Department for teacher certification do not fulfill this Molloy College requirement.

Here are simple rubrics for each of the four assignments, formatted in a table with four columns: **Criteria**, **Excellent (4 pts)**, **Good (3 pts)**, and **Needs Improvement (1–2 pts)**.

Assignment 1: Coding Platform Exploration & Reflection (20%)

Criteria	Excellent (4 pts)	Good (3 pts)	Needs Improvement (1–2 pts)
Platform Exploration	Explores 3 platforms in detail	Explores 2 platforms	Explores only 1 platform or lacks detail

Comparison & Analysis	Clear, thoughtful comparisons with educational relevance	Some comparisons with minor depth	Lacks clear comparison or relevance
Reflection Quality	Insightful and well-organized reflection	Clear reflection with minor organization issues	Unclear or disorganized reflection
Grammar & Presentation	Free of errors, well-formatted	Minor grammar or formatting issues	Multiple errors that distract from content

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Assignment 2: Lesson Plan Design (35%)

Criteria	**Excellent (4 pts)**	**Good (3 pts)**	**Needs Improvement (1–2 pts)**
Objectives & Alignment	Clear, age-appropriate, and aligned with course goals	Mostly appropriate and aligned	Vague or poorly aligned objectives
Creativity & Engagement	Highly engaging and encourages creativity/problem-solving	Some engaging elements	Limited student engagement or creativity
Structure & Clarity	Well-organized with all lesson components included	Mostly organized; few components missing	Lacks organization or key lesson parts
Integration of Tools	Effectively integrates coding platform(s)	Uses platforms with minor integration issues	Limited or ineffective tool use

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Assignment 3: Standards Alignment Activity (20%)

Criteria	Excellent (4 pts)	Good (3 pts)	Needs Improvement (1–2 pts)
Standard Selection	Accurately selects and names 2+ appropriate standards	Standards mostly accurate	Misaligned or unclear standards
Explanation of Alignment	Clear rationale for how activity supports each standard	Some explanation with minor detail gaps	Weak or missing explanation
Relevance of Activity	Activity is highly relevant and developmentally appropriate	Some relevance, may need slight adjustment	Activity is not grade-appropriate
Clarity & Organization	Well-organized and easy to understand	Mostly clear	Disorganized or unclear

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Assignment 4: Final Project – Classroom Coding Simulation (25%)

Criteria	Excellent (4 pts)	Good (3 pts)	Needs Improvement (1–2 pts)
Project Design	Interactive, creative, and clearly supports student learning	Functional with some creativity	Basic or lacks clear learning goals
Use of Coding Tool	Excellent integration of platform features	Adequate integration with minor issues	Limited or inappropriate use of the tool
Student Materials	Clear, complete, and engaging	Mostly complete, may need minor revisions	Missing or unclear materials

Presentation (video/slides)	Clear, organized, and demonstrates the activity well	Mostly clear, minor technical issues	Lacks clarity or completeness