MOLLOY UNIVERSITY
GRADUATE EDUCATION

Special Topics in STEM Leadership

3 graduate credits

COURSE DESCRIPTION

"Special Topics in STEM Education Leadership" is an advanced online graduate course designed for educators, administrators, and curriculum developers interested in the forefront of STEM (Science, Technology, Engineering, and Mathematics) education. This course explores cutting-edge topics such as the integration of Artificial Intelligence in educational settings and the implementation of flipped classroom models. Participants will engage with the latest research in STEM education, examine case studies, and discuss practical applications of these innovative approaches in various educational contexts. The course emphasizes the development of leadership skills necessary to effectively implement and advocate for these emerging educational technologies and pedagogies in schools and educational institutions. Through this course, learners will gain insights into how to shape the future of STEM education and foster a more engaging, dynamic, and effective learning environment

Shared Vision

The Molloy University Teacher Education faculty has derived its vision for the exemplary teacher from the University'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
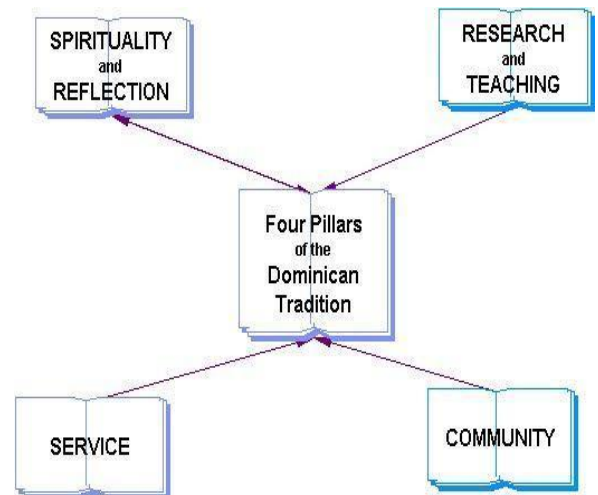
Intellectual curiosity
Independence and risk taking, while promoting collective identity and responsibility
Diversity, multiculturalism and pluralism, including divergent thinking
Passion for teaching
Commitment to students and their communities
Civic responsibility through the promotion of social justice and interdependence
Commitment to democracy

COURSE OBJECTIVES

STUDENT LEARNING OUTCOMES

Students will be able to do the following:

1. **Understand Emerging Technologies in STEM Education**: Gain a comprehensive understanding of the latest technologies, such as Artificial Intelligence, and their applications in STEM education. This includes exploring how these technologies can enhance teaching and learning experiences in science, technology, engineering, and mathematics.
2. **Explore Innovative Pedagogical Approaches**: Investigate and analyze innovative pedagogical approaches, such as flipped classrooms, project-based learning, and collaborative learning strategies, and their impact on student engagement and achievement in STEM subjects.
3. **Apply Current Research to Practical Settings**: Apply the latest research findings in STEM education to real-world educational settings. This involves critically evaluating current studies, identifying best practices, and designing strategies to integrate these findings into classroom instruction and educational policy.

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.

Course Requirements and Evaluation:

Credit for Benchmark Performances will only be given if uploaded to Chalk and Wire by the required date. Failure to upload by the required date will result in no credit and may result in a failing grade for the course.

Grading Criteria:

1. **Participation (20%)**: This assignment focuses solely on active participation in online lectures and seminars. Students are expected to contribute meaningful insights and engage thoughtfully with both the course materials and their peers during classes.
2. **Engagement in Canvas Discussions (25%)**: Students are required to actively participate in online discussion forums on the Canvas learning management system. This involves posting informed responses to weekly topics, engaging in meaningful dialogues with classmates, and reflecting critically on the course content.
3. **Research and Presentation on an Innovative STEM Education Approach (30%)**: This assignment involves conducting detailed research on a cutting-edge method in STEM education, such as AI in learning, gamification, or interdisciplinary teaching. The culmination of this assignment is a comprehensive presentation that discusses the chosen approach, its educational impacts, pros and cons, and implementation strategies.
4. **Final Project or Paper (25%)**: For the final assessment, students can choose either to create a substantial project or compose an in-depth research paper. This work should concentrate on a particular element of STEM education leadership, integrating lessons from the course and individual insights. Options include designing a new STEM initiative, evaluating a specific educational technology's impact, or creating a professional development program for STEM educators.

<u>Academic Integrity Statement</u>:

The University 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 University
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 University. 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.).

APA Manuscript Style

All manuscripts in the field of education are written in the style format of the American Psychological Association.
Candidates in the Graduate Education Programs are required to purchase the Publication Manual
of the American Psychological Association (6th ed.). (2010). Washington, DC: American Psychological Association.
All papers written in every course must adhere to the manuscript prescriptions defined in this
manual.

Communicating Across the Curriculum Program: Percentage of Grade Involving Evaluation of Writing, Speaking, Critical Thinking Skills: 25%

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 University 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 University 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 University 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 University 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 University requirement.