*More detailed course curriculum, including graduate level, alignment with standards, culturally responsive practices, assessments and resources, can be provided upon request

Title of Course*:* STEAM Education

Course Description: Science, Technology, Engineering, Arts, and Mathematical elements all wrapped in one: join us in learning more about this educational framework created for all disciplines and types of learners. It is an integrated, multi-disciplinary avenue for teaching the inter-relationships of how subjects relate in real-life. By adding the arts element educators will learn new ways to: stimulate and develop the imagination, refine cognitive and creative skills, strengthen problem solving and critical thinking skills, nurture team-building, cultural and alternative perspective values, and develop a sense of craftsmanship and goal setting skills needed in the classroom and beyond.

This course will explore the various methods and techniques of shifting to a STEAM perspective by learning contextually; not only in terms of having a framework that illustrates where the subjects overlap, but also in providing a living and adaptable learning structure for ever-changing personal and unpredictable global development.

Instructor Consultation and Interaction
The course is an asynchronous online course that is available for instructor and student participation 24/7. The four-week duration of the class is broken down into four weekly sections each comprised of lecture in the form of instructor created articles and content, web links to academic and professionally reviewed articles in the discipline of general education, and instructor created discussion questions which are, in and of themselves, formative assessments to determine the extent to which the enrollees have comprehended and mastered the skills and information and begun to apply it to their personal teaching practices. The answers to these questions are the basis for the class interaction, as enrollees are required to respond to each other within the classroom.

Proof of Course Completion
LILIE, LLC is committed to assuring that enrollees fully participate in and receive the educational benefits provided by the course. Enrollees must demonstrate participation by making detailed postings designed to foster dialogue among colleagues and instructor that reflect the content, skills/ strategies learned and assessments covered in course. These enrollee postings must be made six times each week, in separate sessions, and including a minimum of 4 academic posts and at least 2 peer-peer comments of others' postings and possible shared assignments. Enrollees are required to submit a detailed reflective feedback n in combination with the archived work. Attempts to falsify record or discussion board entries will result in denial of credit and a report to the enrollee's employer.

Scope & Sequence/Weekly Topics and Objectives

Session I

Objectives	Participants will: • Articulate the philosophy of a STEAM-based education, review and explain the research behind the transition from STEM to STEAM and identify the foundational beliefs of why STEAM is important in engaging students • Understand goals of STEAM-based education according to NYS Next Generation Standards and other reputable sources in order to adopt the philosophy when planning lessons • Explore the different styles of STEAM education and decide which style might best match meet the needs of your diverse students
Topics	During Week 1, participants will provide introductions and goals for learning in this course and how they anticipate applying such to their own practices. A detailed discussion regarding the foundations and the research behind STEAM-based education will be the building blocks for this course and the various instructional strategies and opportunities to infuse STEAM. Through the readings and videos, participants will review and learn about the benefits of STEAM.
Application to Instruction & Student Learning	Impact on Classroom Instruction: Participants will: • Familiarize themselves with the history, philosophy and principles behind STEAM and the impact such has on their instruction. Particular attention will be given to proactively addressing cultural consciousness, specifically how STEAM can be advantageous in teaching a student body of varied unique backgrounds (cultural, social, geographical, educational, special needs populations) and life experiences.

	• Use the conversations and resources shared throughout the course to help prepare students for "bridging the gap between business and educational goals to create a more productive and sustainable global culture based on teamwork." -Yakman Learner Outcomes: Participants will identify informative, helpful resources to transition current learning environments in to learning environments infused with STEAM-based activities through respectful engaging dialogue with others, critical review of resources and understanding and alignment with standards.

Session II

Objectives	Participants will: • Become familiar with strategies for incorporation of more creative, artistic activities into their culturally diverse educational setting • Explore the use of more diversification of teaching methods and become more of a facilitator to learners • Begin planning and sharing with colleagues through discussion board, the preliminary activities or activities that promote steam based education. • Create evaluation system for activities to identify the value and areas in need to improvement with regard to student success and learning. • Explore and clarify your Standards and Curriculum to understand and emphasis on STEAM based education across the disciplines and create objectives of how to implement STEAM
Topics	During week 2, participants will explore creativity, STEAM curriculum and lesson plans and understand the positive, transformative effect STEAM will have on our students' learning and success. Through the readings and postings, participants will learn how other educators have successfully implemented STEAM activities into their own practice and how they may further modify to meet their own needs.
Application to Instruction & Student Learning	Impact on Classroom Instruction: • Planning STEAM activities increases student engagement, exploration and evaluation of information, mastery of the content and creates a climate of student ownership in learning which increases student efficacy. This can be especially effective when teaching students of varied backgrounds (cultural, social, educational, geographical, and special needs population) and life experiences. As students to better identify and internalize information being presented they increase not only their understanding but their engagement and self-confidence in the learning process, creating more successful students and an environment that fosters the inclination to want to continue in the education process. Learner Outcomes:

	Once participants are comfortable with the philosophy behind and practicality of STEAM thus understanding creative ways that the activities can be used to increase student engagement, learning and content/ skill mastery, they will create and implement STEAM lessons in to their own classrooms with confidence and efficacy that engage students, meet their diverse learning needs and provide evidence as to ascertain progress of STEAM based activities.

Session III

Objectives	Participants will: • Show Students Various Technologies That Promote STEAM Principles and offer opportunities for differentiation • Decide Which Method Or Technology Will Work Best With Their culturally diverse ELL, Special Needs, Gifted Student And General Education Populations. These Tools And Technologies Will Allow For Greater Understanding, Mastery And Differentiation. • Identify the elements and benefits of creating a Maker Space for student exploration
Topics	During week 3, participants will start initial work on creating innovative lesson plans and project ideas to share with their students, including new technology based products/techniques/apps. Through the use of these STEAM based ideas, teachers will create collaborative, positive, successful ways for students to synthesize new information to further improve student learning and success.
Application to Instruction & Student Learning	Impact on Classroom Instruction: • As participants further increase their toolbox of STEAM technology options to share with students they will understand which strategy/tech option works best to accomplish learning goals and targets as they apply to the overall student population of their classroom and individuals students therein, keeping in mind each student's unique background (cultural, geographic, educational, or social) and life experiences that create a prism through which they interpret the world around them and any new, incoming information. • Review of implementation of lesson/activity incorporating goals from STEAM based education relevant to participant's subject areas/ content as discussed in week 1 and 2 as well as modifications that can be made to further improve student understanding. Understanding who the students are and their unique backgrounds and life experiences will enable participants to identify which STEAM-based technologies would best encourage positive results in students and create successful, self-confident students hungry to learn more. • Implement meaningful and dynamic STEAM based lessons that are crafted with standards, student needs and interests in mind. Learner Outcomes: Create opportunities to incorporate activities that help educators to become better facilitators of information by teaching in a STEAM-based environment. They will be given

the tools to become the "guide on the side" instead of the "sage on the stage" allowing students to problem solve, create, tinker, and explore more independently.

Session IV

Objectives	Participants will: • Review STEAM strategies, techniques and resources that relate to engagement, creativity, innovation, problem solving, and collaboration and student success; analyze the learning experience in this course by reflecting on professional practices since the beginning of this course and reflect on previous goals. • Correlate 21st century skills applicable to STEAM education and their own instructional practices as well as newly developed lessons and activities from this course. • Provide evaluation and findings of lesson and assessment of student performance and understanding • Critically read and assess other teachers' plans and results as a way to further expand your own understanding and expose students to STEAM based activities/ lessons and apply learned information, skills and understanding through effective feedback • Modify plans, if applicable, for individual grade level and content area using results of lesson, feedback from peers and instructor and post any modifications with explanation.
Topics	In week 4, we will discuss how good, effective, interactive, STEAM education can help our students and ourselves, successfully create college and career ready students that focuses on the basic skill set that a student would need to have in order to survive the career world. These skills include things like creativity and innovation, critical thinking and problem-solving, and technology skills.
Application to Instruction & Student Learning	Impact on Classroom Instruction: • The more emphasis that is focused on developing a well-rounded, relevant, connected science, technology, engineering, ARTS, math based education, the better students will be able to synthesize information and prepare for their college and/or career pathways regardless of student background and life experiences they bring with them into any classroom setting. When students are presented with information in a cohesive, all subject inclusive plan they become more actively involved, better engaged, independent problem solvers and successful students. When teachers address students individually, with a respect and understanding of the unique backgrounds (cultural, geographic, educational, social, and special needs population) and life experiences students bring with them into an academic setting and can construct coursework and lesson plans which utilize these differences in a positive manner, the ability to develop self-confident, successful, and eager learners expands exponentially. • Participants will exit this week with a variety of strategies and skills they may immediately begin infusing into their daily lessons as to provide instruction with a lens focused on STEAM based learning that can be applied in classrooms with diverse student populations, armed with a toolbox of STEAM based technologies

	to incorporate and utilize creative and artistic content to develop well-rounded, self-confident students who better receive and digest new information. Developments will be shared with class and must adhere to a provided rubric that outlines core components of STEAM based learning, standards alignment and opportunities to meet the needs of diverse learners. Learner Outcomes: Participants will become better facilitators of information by incorporating the arts as well as science, technology, engineering and math into their teaching. STEAM-based education is invaluable to synthesis of information and helping students become college and career ready. Learners will benefit greatly from a STEAM-based educational environment where creativity, innovation and connection are the driving factors.