

PENNSYLVANIA DEPARTMENT OF EDUCATION S.T.E.M. ENDORSEMENT

*Develop a STEM (Science, Technology, Engineering, Math) mindset through problem-solving, collaborative learning, and effective communication, through this sequence of four specialized courses based on a **STEAM approach to PDE STEM Endorsement**.*

In an effort to boost student engagement across the sciences, teachers and school leaders began the search for teaching practices which would increasingly pursue authentic curricular and teaching approaches in classrooms across America.

The aim of the innovators was to increase student (STEM). motivation and achievement in the areas of Science, Technology, Engineering, and Math

The main teaching methods emphasized in the approach to the STEM curriculum included, inquiry-based learning and project- or problem-based instruction. These approaches engage students in rich learning experiences, in that students are engaging with authentic problems that actually exist in their world: Why does our city need a sustainable transportation system? How can we help reduce the incidence of cancer in our community? What are some ways I can help my family eat a more healthful diet?

The process of answering these questions is a jumping-off point for learning in mathematics, health, geography, and biology. Rooting curricular content and processes in the real world gives students a “need to know” and keeps them engaged in learning significant content so that they can access higher-level courses as they progress through school.



The Pennsylvania Department of Education defines program endorsements as certifications in new or emerging areas of knowledge where formal certification does not exist. These endorsements are added to existing Level I or Level II teaching certificates. Applicants for graduate credit must apply to Delaware Valley University and hold a valid teaching certificate.

TO APPLY: delval.edu/GradEdApply

- An official copy of undergraduate and graduate transcripts must be on file before your application will be reviewed.
- Candidates interested in adding the online instruction endorsement must possess a valid teaching certificate

These courses are provided through a mutual collaboration of the Bucks County Intermediate Unit (Bucks IU) and Delaware Valley University (DelVal).

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GE 6336 Introduction to STEAM Education

This course is one of four courses that comprise the university's STEAM (science, technology, engineering, arts, mathematics) Approach to the PDE STEM (science, technology, engineering, and mathematics) Endorsement. This course will provide educators with a foundation in STEAM (science, technology, engineering, arts, mathematics) Education, introducing students to each of the STEAM disciplines and their corresponding academic standards: science, technology, engineering, arts, and mathematics.

GE 6337 Integrative STEAM Innovations

This course is designed to help teachers learn and demonstrate an understanding of the newer and emerging tools of the 21st Century. These STEAM tools can help teachers build relevant and engaging instruction, regardless of what content area they are teaching. These STEAM instructional tools can also help students see the connections between and among subjects, including the arts. In addition, this course will also help teachers see that STEAM tools can be used for problem solving and creation. Integrative approaches to K-12 STEAM education not only can help teachers and students see the connections between subjects but when taught in the context of real-world issues, make instruction more engaging and meaningful.

In this course teachers will demonstrate an understanding and working skill set with collaboration tools, real time data collection, simulations, 3D design and 3D printing, and basic coding. In addition to core readings teachers will also explore how art skills and creations can be enhanced through STEAM tools. A common theme running throughout this course is the ability of students to create new expressions of multimedia and collaboration using 21st century tools.

GE 6338 STEAM Applications & Establishing a Community of Practice (CoP)

This course is designed to help teachers demonstrate the development of a unit of Project Based Learning that is infused with STEAM tools of the 21st Century. Project Based Learning is an instructional method in which students gain knowledge and skills by working for an extended period of time to investigate & communicate an authentic, engaging question, problem, or challenge. Newer and emerging tools of STEAM instruction that were explored previously will be focal points of the instruction that will allow students to learn about the challenge in an enriched environment. In addition, the products that are created in this course and others in our program will reside on a digital platform, allowing comments, feedback, and collaboration on extensions of the work. This Community of Practice (CoP) will serve as a future reference for others that take this program and the wider educational community.

GE 6339 STEAM Implementation in Schools and in the Community

This course is one of four courses that comprise the university's STEAM (science, technology, engineering, arts, mathematics) Approach to the PDE STEM (science, technology, engineering, and mathematics) Endorsement. This course will provide educators with a culminating experience in implementing STEAM (science, technology, engineering, arts, mathematics) Education.

This course includes a field experience. Students will participate in one of the Bucks IU's two STEAM Saturday programs (dates occur concurrently with this course).

Due to the sequence of information taught, the classes must be taken in order, but attendees need not take all four.

CONTACT INFORMATION:

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