


Career & Technical Education (CTE) and STEM Office

CTE Programs of Study

May 11, 2016

Delaware Department of Education

Session Goals

- Provide an overview of the Academy of Finance, Biomedical Sciences, Engineering, and Manufacturing Engineering Technology programs of study;
- Discuss professional development opportunities for teachers;
- Discuss early college and early career experiences for students; and
- Discuss next steps and how to submit the program application.

Academy of Finance
Program of Study Overview

- This is a three (3) course Career & Technical Education (CTE) program that connects students to the world of financial services.
  - Partners:
    - National Academy Foundation (NAF)
    - Delaware Technical & Community College
  - Benefits:
    - NAFTrack Certification
    - NAFTrack Certified Hiring
    - 120-hour paid internship
    - Grants, Scholarships, and Awards

Academy of Finance
Overview of Courses

Fundamentals of Finance (FOF)

This course provides students with an essential knowledge of finance in society, the impact of technology on the financial services field, and the role of finance in organizations. This course is a prerequisite to other AOF pathway courses.

Principles of Accounting (POA)

This course provides students with an understanding of the critical accounting process and how it facilitates decision making by providing data and information to internal and external stakeholders.

Financial Services (FS)

This course provides students with the history of money and banking in the United States. Students will learn to research and discriminate between investment options through an in-depth study of the financial services industry and are also introduced to the critical role of insurance in the financial services sector.

Academy of Finance Professional Development

- The Academy of Finance Summer Professional Development will occur in the summer of 2016 in a partnership between DDOE and National Academy Foundation (NAF).
  - Where: Delaware Tech – Terry Campus
  - When: August 1–5, 2016
  - Time: 8:30 am – 4:30 pm daily
  - Provided by: National Academy Foundation and the Delaware Department of Education
  - Cost: Registration and costs for teacher participation are included in the membership fee
  - PDMS Course #24733 Section 41795

Academy of Finance
Early Career & College Experiences

Work-Based Learning Experiences:

- NAF Continuum of Work-Based Learning

Articulation:

- The Delaware Department of Education is currently negotiating articulation agreements/dual enrollment with Delaware Technical and Community College, Delaware State University, and the University of Delaware.
- NAF has partnered with several colleges and universities across the US to provide articulated credits.

PLTW Engineering
Program of Study Overview

- In comprehensive schools this pathway is a three (3) course program, in technical schools it is a six (6) course Career & Technical Education (CTE) program that engages students in open-ended problem solving, the application of the engineering design process, and use of industry-leading technology and software.
  - Partners: UD, DSU, DTCC, Project Lead the Way
  - Benefits: Curriculum and assessments developed in partnership with business & industry and higher education; course specific professional development; national and state network of support including student scholarships and early college credit.

PLTW Engineering
Overview of Courses

Course 1: Introduction to Engineering Design

Students use the engineering design process to apply math and science to authentic projects. They work both individually and in teams to design solutions to a variety of problems as well as build physical and mathematical models.

Course 2: Principles of Engineering

Students explore a broad range of engineering topics, including mechanisms, materials, statics, vectors, and automation. Students develop skills in problem solving, research, and design while learning strategies for design process documentation, collaboration, and presentation.

Course 3: Engineering Design and Development

Students identify an issue and then research, design, and test a solution, ultimately presenting their solution to a panel of engineers. Students apply professional skills to document a design process to standards and as a result are ready to take on a post-secondary program or career.

PLTW Engineering
Overview of Courses

Course 4: Digital Electronics

Students are provided with a foundation in electrical engineering, electronics, and circuit design. Students study topics such as combinational and sequential logic and are exposed to circuit design tools used in industry, including logic gates, integrated circuits, and programmable logic devices.

Course 5: Aerospace Engineering

Students learn the fundamentals of atmospheric and space flight. Students explore the physics of flight, the concepts to life by designing an airfoil, propulsion system, and rockets. Students learn basic orbital mechanics using industry-standard software and explore robotic systems through projects such as remotely operated vehicles.

Course 6: Civil Engineering and Architecture

Students learn fundamental aspects of building and site design and development. Students apply math, science, and standard engineering practices to design both residential and commercial projects and document their work using 3D architecture design software.

PLTW Engineering Professional Development

- Project Lead the Way Introduction to Engineering Training:
  - Where: University of Delaware
  - Registration: https://www.pltw.org/core-training-course-offerings
- Project Lead the Way Principles of Engineering Training:
  - Where: University of Delaware
  - Registration: https://www.pltw.org/core-training-course-offerings

Cost: Registration and costs for teacher participation are allowable expenses through the Innovative grant

PLTW Biomedical Science Program of Study Overview

- This is a three (3) course Career & Technical Education (CTE) program that engages students in open-ended problem solving where students study the concepts of human medicine, physiology, genetics, microbiology, and public health.
  - Partners: UD, DSU, DTCC, Project Lead the Way
  - Benefits: Curriculum and assessments developed in partnership with business & industry and higher education; course specific professional development; national and state network of support including student scholarships and early college credit.

PLTW Biomedical Science Overview of Courses

Course 1: Principles of Biomedical Science

Students explore concepts of biology and medicine to determine factors that led to the death of a fictional person by examining autopsy reports, investigating medical histories, and exploring medical treatments that might have prolonged the person's life.

Course 2: Human Body Systems

Students examine the interactions of human body systems as they explore identity, power, movement, protection, and homeostasis. Students use data acquisition software to monitor body functions such as muscle movement, reflex and voluntary action, and respiration.

Course 3: Medical Interventions

Students follow the life of a fictitious family as they investigate how to prevent, diagnose, and treat disease. Students explore how to detect and fight infection; screen and evaluate the code in human DNA; evaluate cancer treatment options; and prevail when the organs of the body begin to fail.

PLTW Biomedical Science Professional Development

- Project Lead the Way Biomedical Sciences Training:
  - Where: Stevenson University (Baltimore County, MD)
  - Registration: https://www.pltw.org/core-training-course-offerings
  - Provided by: Stevenson University and PLTW
  - Cost: Registration and costs for teacher participation are allowable expenses through the Innovation Grant

PLTW Engineering and Biomedical Science Early Career & College Experiences

Work-Based Learning Experiences:

- The curriculum includes opportunities for LEAs to engage their advisory committees through industry mentored projects and experiences:
  - ENG – Product developed in partnership with industry board
  - BMS – Independent research conducted in partnership with advisory board

Articulation:

- There are more than 60 post-secondary institutions across the country that currently offer scholarships, admission preference, and early college credit for PLTW.
- In-state articulations are under development with DTCC, DSU, and UD.

Manufacturing Engineering Technology Program of Study Overview

Manufacturing Engineering Technology :

- This is a three (3) course Career & Technical Education (CTE) program that allows students to explore and practice skills related to careers in manufacturing, engineering technology, and STEM.
  - Partner: Delaware Technical Community College.
  - Benefits: Alignment to engineering technology programs at DTCC; curriculum developed in partnership with business & industry and higher education; course specific professional development; national and state network of support including early college credit.

Manufacturing Engineering Technology Overview of Courses

Foundations of Technology (FOT)

Foundations of Technology (FOT) prepares students with the ability to innovate, improvise, and invent. Students develop foundational skills in engineering design and documentation as a formal process to transform ideas into products or systems.

Advanced Design Applications (ADA)

Advanced Design Applications (ADA) prepares students with the skills needed to apply advanced applications in design with a focus on systems thinking, the impacts of technological development, and the use of industry-leading technologies in the creation of models, mock-ups, and prototypes to create engineered solutions.

Engineering Design (ED)

Engineering Design (ED) is the capstone course that provides students with the knowledge and skills needed to transform concepts into products that meet consumer requirements. Students will practice the engineering design process by creating, synthesizing, iterating, and presenting solutions.

Manufacturing Engineering Technology Professional Development

Manufacturing Engineering Technology :

- The Manufacturing Engineering Technology will occur in the summer of 2016 in a partnership between DDOE and DTCC.
  - Where: Caesar Rodney High School
  - When: August 1-5, 2016
  - Time: 8:30-4:30 pm daily
  - Provided by: The STEM Center for Teaching and Learning™ and the Delaware Department of Education
  - Cost: Registration and costs for teacher participation are allowable expenses through the Innovation grant

Manufacturing Engineering Technology Early Career & College Experiences

Work-Based Learning Experiences:

- The curriculum includes opportunities for LEAs to engage their advisory committees through industry mentored projects and experiences, examples below:
  - Engineering Design – product developed in partnership with industry board

Articulation:

- In-state articulations are under development with Delaware Technical Community College (DTCC).

Application & Approval

Application and Approval Process :

- The programs of study application can be found online at: http://www.doe.k12.de.us/domain/384
- All applications due November 30 for implementation in the following school year

The LEA is required to:

- Submit the Labor Market Information Review;
- Staff a Program Advisory Committee;
- Complete the "Value-added Opportunities" portion of the application; and
- Complete the Program of Study Matrix.

Contact Information

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CTE and STEM Workgroup

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