

Advanced Professional Studies - Engineering and Advanced Manufacturing

Mehlville School District
Advanced Professional Studies/CAPS
Grades 11 - 12, Duration 1 Year, 3 Credits

Rationale

The course is designed for the student who is interested in engineering and manufacturing fundamentals, entrepreneurship, and innovation. It will provide an entrepreneurial approach to education that is designed to give the high school student hands-on, real world experience in Engineering and Manufacturing.

Course Description

This course provides the student the ability to truly step outside the traditional classroom for a fast-paced and unique experience. The projects that the student completes come directly from business partners and are designed to give the high school student a hands-on, real world experience in engineering and advanced manufacturing. The student is fully immersed in a profession-based learning approach and will work collaboratively with professionals in the field of engineering on a regular basis. The course is designed for the student who is interested in engineering and manufacturing fundamentals, entrepreneurship, and innovation. The student will be immersed with engineers and manufacturers using state-of-the-art tools and software to create and test 3D prototypes solving complex problems. The student works in multidisciplinary teams to provide innovative solutions to a company's real-world problems. Engineering projects are tailored to student interest in the fields of chemical, electrical, mechanical, civil, environmental, software/computer, architecture, advanced manufacturing, robotics, and biological. This course is modeled after cutting-edge engineering schools and endorsed by Project Lead the Way. The student works extensively with professionals from industries such as Essex Industries, Monsanto and Ameren. The student has the opportunity to complete the PLTW capstone course requirements as part of the CAPS experience. The student will also have the opportunity to complete an internship with a business and industry partner. The student must apply for acceptance into the STL CAPS program. College credit is available.

Prerequisites

None; however, previous participation in PLTW Engineering courses recommended. The student must submit an application to be considered for the program.

Course Objectives

- 1) The student will gain an understanding of what goes on in an engineering and/or manufacturing workplace.
- 2) The student will learn how computers and machines link design and manufacturing processes.
- 3) The student will gain first-hand experience working on design teams to define and solve problems.
- 4) The student will improve their existing solid modeling skills.
- 5) The student will learn basic CNC programming and apply it to several machines.
- 6) The student will learn basic industrial robotic programming.
- 7) The student will improve their computer skills – Word, Excel, and PowerPoint.
- 8) The student will improve their oral and written communication skills.
- 9) The student will improve interpersonal and professionalism skills.
- 10) The student will conclude the course having developed a stronger understanding about what they want to study during college especially as it relates to a career in engineering or manufacturing.
- 11) The student will learn about the entrepreneurial mindset and demonstrate these characteristics when solving problems for business and industry partners.
- 12) The student will apply knowledge to real-world problems in a real-world work experience setting.
- 13) The student will develop sound decision-making skills through the professional-based work experience.
- 14) The student will describe and demonstrate appropriate professional conduct in a work environment.
- 15) The student will develop a professional vision that values diversity in the workplace.

BOE 11/10/16

**Advanced Professional Studies - Engineering and
Advanced Manufacturing**

Mehlville School District
Advanced Professional Studies/CAPS
Grades 11 - 12, Duration 1 Year, 3 Credits