

# Pre-Engineering Curriculum

The Pre-Engineering major is designed to expose students to a wide variety of engineering disciplines while developing skills needed to be successful in college and/or a career in engineering. Digital curriculums and engineering modules are used to introduce students to many different types of engineering. Students are allowed to pursue their particular areas of interest .

## Course 1: Core Engineering 1

.The junior year of Pre-Engineering explores the world of engineering through many lenses. Students will work on various engineering modules, shadow professionals to gather information about career fields in engineering, communicate their findings to the class, and work with robotics kits and curriculum for preparation for a variety of competitions.

## Course 2: Core Engineering 2

3D Solid Modeling software will be utilized to prepare students for CSWA (Certificate of SolidWorks Associate) Certification in SolidWorks. Students will also participate in several off campus STEM experiences to enhance and explore different aspects of a career in engineering. Students are allowed to pursue their particular areas of interest through off campus experiences such as shadowing for juniors

## Course 3: Core Engineering 3

Robotic challenges will be used to develop and test designs for drive trains, robotic arms, end effectors (grippers), programming, pneumatic systems, and advanced electronic applications using sensors of many types (line tracking, range finding, motion detectors, and photoelectric light tracking with infrared cameras). The senior portfolio will serve as evidence of progress and justification of competencies demonstrated through assignments. Seniors will be exposed to 3D Solid Modeling drafting this year through the STEM Academy curriculum using SolidWorks software while seeking national certification (CSWA) Certificate of SolidWorks Associate.

## Courses 4: Core Engineering 4

Seniors will spend all year focusing on internships, and the Senior Exhibition of Mastery project. Each student will submit a detailed proposal identifying and describing all components of their mastery project. Students will be placed in an internship for 6 to 16 weeks. While in the internship the product component of the mastery project will be addressed and any models or physical parts to be built will be completed. For the final stage of mastery, students will create a formal presentation to communicate their findings to the class, a panel of business partners, parents, and guests. Students will also gain experience in robotics.