



# Project Based Engineering

Grades 11 & 12

Niagara Career and Technical Education Center Only. Student will be engaged in team-based projects while still being responsible for directing their own curriculum concentration, projects and areas of exploration within the engineering sciences. Collaborative teaching strategies and extensive active learning techniques make the learning process an active one. Our program has been recognized as leading edge with over 100 NYS and 16 National SkillsUSA champions who have graduated from this program in automated manufacturing and precision machine technology.

## Units of Study

**Introduction to Engineering Design** – A unit that teaches problem-solving skills using a design development process. Models of product solutions are created, analyzed and communicated using solid modeling computer design software.

**Principles of Engineering** – A unit of study that helps students understand the field of engineering. Exploring various technology systems and manufacturing processes help students learn how engineers and technicians use math, science and technology in an engineering problem-solving process to benefit people. The course also includes concerns and social and political consequences of technological change.

**Computer Integrated Manufacturing** – A unit that applies principles of robotics, automation and CAD design. The unit builds on computer solid modeling skills developed in Introduction to Engineering Design, and Design and Drawing for Production. Students use Computer Numerical Control equipment to produce actual models of their three-dimensional designs. Fundamental concepts of robotics used in automated manufacturing and design analysis are included.

**Engineering Design and Development** – An engineering research unit in which students work in teams to research, design and construct a solution to an open-ended engineering problem. Students apply principles developed in the three preceding courses and are guided by a community mentor. They must present progress reports, submit a final written report and defend their solutions to a panel of outside reviewers at the end of the school year.

**Advanced Manufacturing** – In our high-tech lab each student will be responsible for bringing their intelligent designs to life. All students will learn to program and operate industrial machine tools including: lathes, grinders and state of the art automated equipment. In addition, all students will study and master the use of manufacturing inspection tools and complete related quality control documentation.

## Applied Academics

Students enrolled in the Project Based Engineering program can earn credits that will satisfy core academic requirements in English Language Arts, Math and Science. Through the integration of these core academics, achieving a Regents Diploma remains in reach.

## College Agreements

In addition to gaining the skills needed to enter the workforce, this program provides an excellent foundation for students looking to enter a college program. Articulation agreements for college credit are in place with: Alfred State School of Applied Technology (6 hours), Bryant and Stratton College and Niagara County Community College (10 credit hours).

## How to Enroll

Orleans/Niagara BOCES partners with local school districts to provide exciting hands-on career and technical training during normal school day. To learn more, speak with your high school counselor or you can contact Orleans/Niagara BOCES Niagara Career and Technical Education Center Principal Anedda Trautman at [atraitman@onboces.org](mailto:atraitman@onboces.org).

## Teacher Information

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