

PROGRAM: **Engineering Sciences**

**PROGRAM
CIP CODE:** **15.0000.00**

DESCRIPTION: The **Engineering Sciences** program is designed to develop student's understanding of engineering problem solving and design practices. The program will prepare students to apply fundamental scientific and mathematical laws and principles relevant to engineering and technology. Students will learn to use systems of measurement, apply engineering technologies and tools as well as learn about the different disciplines and opportunities within the field of engineering. The program is designed and delivered as a coherent sequence of experiences using technical instruction, academic foundations, experiential learning, supervised occupational experience and leadership and personal development through the Career and Technical Student Organization, SkillsUSA.

RECOMMENDED PROGRAM SEQUENCE OF COURSES:

**Career
Preparation** The following describes the recommended courses developed from industry-validated skills necessary for initial employment or continued related education.

15.0000.10 **Fundamentals of Engineering Sciences:** This course will teach the basic knowledge of Engineering principles and systems such as the engineering process, system analysis and control, focusing on the application of mathematical laws and principals.

-or-

15.0000.11 **Algebra II or above Math Course:** (course may be taken simultaneously with 15.0000.20)

-and-

15.0000.20 **Applications of Problem Solving in Engineering Sciences:** This course provides an opportunity for students to apply fundamentals in the world of new technologies emerging from engineering research such as nanotechnology, chemical, environmental or mechanical engineering. This includes the use of hand machine tools, computer aided tools and measurement systems. Students will learn how to link theory to hands-on real-world applications.

-and-

15.0000.30 **Advanced Engineering Sciences:** This course prepares students to use critical thinking skills and apply formulations from pre-calculus to basic innovative engineering job functions of research, design, development, testing and analysis when preparing product. Students will apply concepts of math and science, and problem solving skills to the different systems using input, process, output and feedback. Students will further demonstrate the fundamentals of engineering and mechanics using scientific principles from materials to to construct a project with consideration to environmental factors, economics and safety. This course is modeled to university criterion covering engineering theory through a hands-on approach.

And program may elect to add:

15.0000.75 **Engineering Sciences - Internship:** This course provides CTE students an opportunity to engage in learning through participation in a structured work experience that can either be paid or unpaid and does not necessarily require classroom instruction.

-or-

15.0000.80 **Engineering Sciences - Cooperative Education:** This course utilizes cooperative education methodology to combine school-based and supervised work-based learning experiences directly related to the standards identified for the Engineering Sciences program.

TEACHER CERTIFICATION REQUIREMENTS FOR THE ENGINEERING SCIENCES PROGRAM

CAREER PREPARATION: The instructor must be CTE certified according to the following table

Engineering Sciences	CERTIFICATES Types: PCTI, PCTIEP, SCTI, SCTIEP
<p>Note:</p> <ul style="list-style-type: none"> ▪ Engineering Sciences, 15.0000.70 may be a part of the sequence and the teacher must hold a Cooperative Education Endorsement (CEN). ▪ Teacher/Coordinator 15.0000.75 is not required to have a Cooperative Education Endorsement (CEN). ▪ Teacher/Coordinator 15.0000.80 is required to have a Cooperative Education Endorsement (CEN). 	

CERTIFICATE ABBREVIATIONS FOR THE ENGINEERING SCIENCES PROGRAM

Certificate Types	
PCTI	Provisional Career and Technical Education Industrial Technology
PCTIEP	Provisional Career and Technical Education Industrial and Emerging Technologies
SCTI	Standard Career and Technical Education Industrial Technology
SCTIEP	Standard Career and Technical Education Industrial and Emerging Technologies