

# St. Croix Lutheran STEM Program

## WHAT IS STEM?

STEM stands for Science, Technology, Engineering, and Math. STEM courses and programs have never been more valuable than they are today. Business leaders have been seeking individuals with 21st century learning capabilities for the past decade. Students with two year and four year degrees in STEM related fields are desired in the work force. As SCL strives to prepare students for life and careers beyond high school, STEM classes are a natural fit for its curriculum.

## HOW IS IT TAUGHT?

The PLTW Gateway program provides engineering and biomedical science curriculum for students that challenges, inspires, and offers schools variety and flexibility. Students get rigorous and relevant experiences through activity-, project-, and problem-based learning. They use industry-leading technology to solve problems while gaining skills in communication, collaboration, critical-thinking, and creativity.

The PLTW Pathway To Engineering (PTE) program is a sequence of courses which follows a proven hands-on, real-world problem-solving approach to learning. Throughout PTE, students learn and apply the design process, acquire strong teamwork and communication proficiency, and develop organizational, critical-thinking, and problem-solving skills. They discover the answers to questions like how are things made and what processes go into creating products?

Students use the same industry-leading 3D design software used by companies like Intel, Lockheed Martin and Pixar. They explore aerodynamics, astronautics and space life sciences.

Students apply biological and engineering concepts related to biomechanics (robotics). They design, test, and actually construct circuits and devices such as smart phones and tablets and work collaboratively on a culminating capstone project.

## WHY IS IT VALUABLE FOR A STUDENT?

The need for individuals to fill STEM related careers has exploded. Students have the opportunity to explore components of these careers through this program. Students who like technology, problem solving, math, and science will enjoy the in-depth STEM classes. The use of technology and hands-on learning provides a learning opportunity unique to this program. We will be using curriculum from Project Lead the Way, a nationally recognized STEM education program.

## WHO CAN TAKE THE CLASS?

In grades 6-8, all students take a semester of a STEM science class. In grades 9-12, any student can select a STEM class as an elective. Female students are especially encouraged to consider this program. Significant college scholarship opportunities are available for STEM related programs. The enrollment will be limited to 20 students per section; therefore early enrollment will be important.

## IS THERE A COURSE FEE?

The semester-long STEM program for grades 6-8 carries no additional fees. However, the high school program has an additional course fee of \$500 for the initial year-long course. The high costs of technology and materials make this course significantly more costly than other courses at SCL. Therefore we are asking the participants to share in this cost.

## CAN I GET COLLEGE CREDIT FOR A CLASS?

High school students can receive transcribed credit through the University of Minnesota Twin Cities campus. They are eligible for this credit by passing the course with a B or better and then passing a college-determined test. The cost for the credits is an additional \$100 payable to the University of MN.

## WHAT CLASSES WILL BE OFFERED IN 2017-2018?

Middle School:

The Middle School is on a three-year rotation of STEM classes: Design and Modeling, Automation and Robotics, and Green Architecture.

High School:

*Introduction to Engineering Design (IED)*

The major focus of IED is the design process and its application. Through hands-on projects, students apply engineering standards and document their work. Students use industry standard 3D modeling software to help them design solutions to solve proposed problems. They will document their work using an engineer's notebook, and communicate solutions to peers and members of the professional community.

*Principles Of Engineering (POE)*

Through problems that engage and challenge, students explore a broad range of engineering topics, including mechanisms, the strength of structures and materials, and automation. Students develop skills in problem solving, research, and design while learning strategies for design process documentation, collaboration, and presentation.

*Computer Science Principles*

Open doors in any career with computer science! In CSP, students create apps for mobile devices, automate tasks in a variety of languages, and find patterns in data. Students collaborate to create and present solutions that can improve people's lives, and weigh the ethical and societal issues of how computing and digital connectivity are changing the world.

## WILL ADDITIONAL COURSES BE OFFERED IN THE FUTURE?

One or two additional high school courses will be offered at SCL. One course may be offered in partnership with another institution. IED is a foundational course and it serves as a prerequisite to other course offerings. Principals of Engineering (POE) is open to students who have successfully completed IED.



**Educating the Total Student. Spiritually, Intellectually, Physically.**