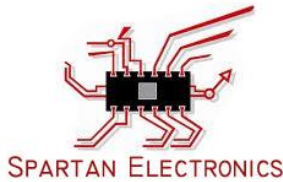


# Spartan Engineering – Electronics - Robotics

A North Surrey Secondary Corporation



## NSS: Engineering – Electronics – Robotics

### **Introduction to Engineering Design (Eng. Level 1)**

Students dig deep into the engineering design process, applying science, technology, engineering and math(STEM) standards to hands-on projects. They work both individually and in teams to design solutions to a variety of problems using hand built models, 3D modeling software and use an engineering notebook to document their work.

### **Digital Electronics (Elex. Level 1)**

From smart phones and computers to appliances and motor vehicles, digital circuits are all around us. This course provides a foundation for students who are interested in electrical engineering, electronics, or circuit design. Students study topics that range from basic electronics to computer programming and use an engineering notebook to document their work.

### **Robotic Basics (Robots Level 1)**

This is a beginning course in robotics. Where the student will be utilizing Arduino based digital control systems. The objective of this course is to introduce the student to basic programming as well as problem solving strategies. This course will involve students in the development, building and programming of a mini Arduino / VEX robot. Students will work hands-on in teams to design, build, program and document their progress. Topics may include motor control, gear ratios, torque, friction, sensors, timing, program loops, logic gates, decision-making, timing sequences. Students will use an engineering notebook to document their work.

## **Principles of Engineering (EER. Level 2)**

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.

## **Digital Electronics (EER. Level 2)**

Building upon electronics basic, students will explore advanced topics of designing electronic projects involving higher level programming and construction. Using the Arduino microprocessor students will explore and develop their own programs that control different electrical components and use these skills to solve different real world problems.

## **Robotics (Robots Level 2)**

This is an advance course in robotics. Where the student will be utilizing Robot C programming control systems. The objective of this course is to continue the students understanding of programming as well as problem solving strategies. This course will involve students in the development, building and programming of different VEX robots. Students will work hands-on in teams to design, build, program and document their progress. Each team will be given specific "Problem" challenge that their robots need to overcome.