



Southmoreland School District Robotics/VEX Curriculum Overview

Robotics/Vex Overview:

This course is an advanced-style programming course from the NXT software. Students will learn and utilize the VEX-Robot C programming language. The building format will utilize VEX software and hardware, utilizing a variety of challenges that were similarly found in the NXT course. Use of autonomous and remote applications will be used during this course. Programming language will progressively build throughout the course.

Module Titles:

- Module 1: Robot C Fundamentals**
- Module 2: Encoders & Auto Straightening**
- Module 3: Variable & Functions**
- Module 4: Sensors & Programming Logic**
- Module 5: Remote Control**

Module Overviews:

Module 1: Robot C Fundamentals

The biggest transition from the NXT platform to VEX is the programming language. RobotC is a scripted programming language; we will start with the basics of beginning a code, identify motors and sensors related to the input/output ports they are connected to, proper punctuation within the program and simple motor commands.

Module 2: Encoders; Auto Straightening

The first major sensor utilized is the optical shaft encoder which will count axle rotations. Utilizing a while loop with three “if statements” will allow the robot to read those encoder values to adjust and correct forward movements during the challenges. This will permit straighter movements on future challenges.

Module 3: Variable & Functions

Building upon the programming skills developed thus far, students begin to condense repeated sections of code in sections by creating functions for those repeated sections. Establishing variables within those functions will allow different values to be present for different behaviors while making speed adjustments in one location versus over several lines of code.



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Module 4: Sensors & Programming Logic

Students increase their programming skills with additional sensors including: Ultrasonic, Line tracking, potentiometers, and touch sensors. A variety of challenges will assist in preparing for the final programming challenges of the course.

Module 5: Remote Control

There are two possible challenges students may attempt: the mine removal challenge or the swept away challenge. Students will rebuild their robots to equip them with the required number of sensors and motors/attachments to complete the assigned challenge. Students will receive a VEX Remote transmitter and will be required to program the robot using the desired channel buttons to create the desired outcomes. Movements will require programming logic with various sensors to complete the challenges.