

Robotics II Spring 2023

Northwest Cabarrus High School

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Remind Code: @trobo2

Welcome to Robotics III! In this course, you will build on your knowledge and skills from Robotics I to construct and program robots with enhanced capabilities.

Policies

Grades in this course will be based on mastery of course content (assignments & tests) as well as active participation in class activities and projects. I will make accommodations as needed, please contact me if you need to discuss them. Students will have a one week grace period to turn in any late assignment without penalty. After a week, students will lose 5 points per day that an assignment is late.

If you are ever absent, please check out Canvas for any work you may have missed, and definitely speak to me if you have any concerns about work you've missed, or if you have questions about your grades or the class in general. I am reachable by email, and also via Remind.

During this course, students will work with hands-on projects. They will use electrical batteries and motors, as well as build gear trains with moving parts. They will also use simple tools, including ones with sharp blades. Before any activity, students will review safety procedures, but some risk is inherent in using robots. Please contact me if you have any questions or concerns about your student using simple tools.

Course Overview

REC Unit 4 with Vex V5: Sensors

REC Unit 4: Sensors introduces students to open and closed loop robotic navigation using sensors. Building on programs constructed in Unit 2, students add digital bumper switches, ultrasonic range-finding sensors and line-following sensors to the BaseBot so that it can interpret its environment autonomously. Students learn advanced drive functions to simplify the autonomous control of the robot. In the final project the robot must autonomously locate and interact with objects on the playing field in a specified time period.

REC Unit 5 with Vex V5: Arms and End Effectors

REC Unit 5: Arms and End Effectors builds on the concepts learned in Units 3 and 4. An arm and end effector is added to the BaseBot and a physics analysis is done on how the addition of the arm affects

the overall robot design. Students are challenged to control the movement of the arm by modifying the design of the arm and programming. In the final activity, students must program the BaseBot to interact with a ball on the playing field while using radio control.

REC Unit 6 with Vex V5: Final Project

This multi-week project reinforces all the concepts covered in the previous lessons and adds the excitement of robotic competitions to the learning process. Student teams create a robot to perform specified tasks on the playing field and compete in separate competitions - operating the robot using radio control, and operating the robot autonomously, with no user input.