Cornerstone Robotics Club (Spring 2015)

Instructor Contact Information

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Course Prerequisites - NONE

Course Description

The Cornerstone Robotics Club serves to expose students to fundamental mechanics and electronics concepts through hands-on learning with robotics. Through participation in this club, students will apply interdisciplinary science and math concepts to create functional robots that can achieve various goals.

Learning Objectives

Through participation in this club, students will learn:

- Fundamental physics concepts (i.e. levers, gears)
- Fundamental electronics concepts (i.e. battery power distribution, computer processor operations)
- Fundamental programming concepts (i.e. structured commands, data input/output, if-then statements, loops)

Course Format

The Cornerstone Robotics Club will be a combination of brief lectures interspersed with a significant amount of hands-on lab activity. Club activities are formatted for a normal semester. Club sessions are nominally 90 minutes in length and scheduled once per week during 2nd Period.

Course Grading Scale - No grades will be given for this club-level activity.

Assignments

Occasional light reading or project planning may be assigned to enable club members to get the most out of the classroom activities.

Expectations:

Club members are simply expected to apply their best effort, respect the club equipment, and fully participate during the club period.

Menu of Club Topics

LEGO Robotics

- Fundamentals of Brick Building for Robotics
    - Leverage and gearing
    - Learning how to build with the Lego robotics parts
    - Learning how to build a strong base for robotics inventions
- Fundamentals of Lego NXT and RCX Robotics Controllers.
    - Basic motor programming
    - Rotations
    - Degrees
    - Seconds
- Basic sensors for NXT and RCX. Basic projects include programming sensor and motor control routines for line following, object avoidance, sorting, and distance navigation.
    - Touch
    - Sound
    - Light
    - Color
    - Ultrasonic
- Robotics Maze Project
    - Designing a robot to follow a course and complete several tasks
- Robotic Butler Project
    - Design a robot to interact with humans

VEX Robotics (If time permits)

- Introduction to working with metal and building basic parts
- Introduction to power & wiring
- Learning about medium-scale motors and gears
- Introduction to VEX sensors & programing
- Complete a VEX challenge (bean bags or ball scoring)