COURSE DESCRIPTION

This is a beginning course in robotics. We will be utilizing VEX, VEX IQ, FIRST FRC and Parallax Boebots Robotics materials. 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 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, propulsion systems and binary number systems. Student designed robots will be programmed to compete in various tournaments as developed by VEX.

We hope that this class will provide motivation for students to continue in computer science and engineering courses.

COURSE OBJECTIVES

Students will learn, understand and know the following:

- How to collaborate in groups and teams
- How to design robots for specific activities and scenarios
- How to use RobotC programming software
- Gears, pulleys, timing, sensors and program loops
- To design, develop and complete robotic activities and challenges

REQUIRED TEXT & MATERIALS

2” 3 Ring Binder- with Tabs
Engineering Notebook

*Some of the projects will require extra materials from home to complete*

EVALUATION CRITERIA

The grade for each grading period is composed of:
80% = Daily Work, Projects, Participation, & Work Ethics
20% = Tests, Quizzes, & Practical’s

The semester grade is composed of:
80% = Term 1 + Term 2 (cumulative)
20% = Final Exam

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COURSE OUTLINE
Semester 1
- Unit 1: Introduction to Engineering
- Unit 2: Introduction to Robotics
- Unit 3: Introduction to VEXnet
- Unit 3A: FTC Android Platform Training Resources
- Unit 4: Introduction to Autodesk Inventor

Semester 2
- Unit 5: The Game!
- Unit 6: Object Manipulation
- Unit 7: Speed, Power, Torque & DC Motors
- Unit 8: Mechanical Power Transmission
- Unit 9: Drivetrain Design
- Unit 10: Lifting Mechanisms
- Unit 11: Systems Integration
- Unit 12: Testing and the Iteration Process