



PIONEERS Co-Op

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Overview of STEM II – Robotics with Mindstorm (Grades 10-12)

Tutor: TBD

Requirement: Home computer/access to internet (Khan Academy)

Prerequisite: STEM I – Drafting w/ Projects and teacher approval

Lab Fee: \$5.00 each semester

Student Evaluation: % of semester grade

Homework	50%
Team Compete 1	10%
Team Compete 2	10%
Semester Exam	10%
Participation	20%

Grading Scale

90-100%	=A
80-89%	=B
70-79%	=C
60-69%	=D
Less than 60%	=F

Course Description: Science/Technology/Engineering/Math (STEM) is found intertwined in every aspect of each planned hands-on activity designed to represent real-world projects one might find in industry. While this is a broad topic, the class scope will be based on topics from Physics. Most projects will involve working as a team, collecting data, public presentation of results, iteration of design ideas/achievement of specific goals. Although there is team involvement, each individual will be expected to complete all the work required. Semester exam will cover concepts as found in the online homework, which presently is learning Java programming language using Khan Academy.

This class will use the Lego Mindstorm EV3 and students will design, build and test the robot in order to complete specific tasks as given by design constraints. These tasks come from a past year kit from a Lego First Robotics Competition. (See link <http://www.firstlegoleague.org/past-challenges> 2014 FLL World Class is the board that is available.)

Most class time will be split between time working together on the various tasks. The team will rotate roles (e.g. Programmer, Builder, etc.) over time, so each student can learn various skills involved. The team(s) will compete against itself or each other to beat times for each task and gain various points for completing each task.

Some of the concepts to be studied include:

- Various sensors
- Line Following
- Decision-making
- Programming using Java
- Design Process
- Design Iteration