

PETERS TOWNSHIP HIGH SCHOOL

COURSE SYLLABUS: AGILE ROBOTICS I

Course Information	Teacher Information
<u>Course Length:</u> Semester <u>Class Location:</u> G08	<u>Name:</u> Mr. Walsh <u>Phone:</u> 724.941.6250 ext. 5309 <u>Email:</u> walshd@pt-sd.org

Course Overview and Essential Skills

This course provides a basic foundation in robotics technology with particular concentration on first generation robotics. Due to the multi-disciplinary nature of robotics, the student is exposed to the many facets of robotics including material from computer, electrical, and mechanical disciplines with a focus on engineering processes. The course features a breadth/depth ratio of 80% lab component and 20% direction instruction component. The laboratory component features basic activities to solidify lecture concepts and team-oriented, hands-on projects to solve basic robotics problems. The integrated approach to Science Technology Education and Math (STEM) system of teaching is employed throughout this course to give the 21st Century learner a great experience.

Course Textbook and Required Materials

- Robotics Curriculum Project: Agile Robotics Course I Curriculum, Carnegie Mellon / California University
- Super Bundle Robotics Kits (12 robot package) Innovative First Corporation,
<http://www.vexrobotics.com/vex/products/robot-starter-kits>

Course Outline of Material Covered:

Unit or Topic	Concepts/Skills/Resources	Timeframe
Unit of study or major topic as outlined in curriculum	Unit specific skills or concepts, could include projects or labs, movies used or other specific resources, etc	May indicate the month or amount of time for unit
INTRODUCTION TO ROBOTICS AND INTELLEGENCE SYSTEMS	<ul style="list-style-type: none"> • Summarize a robotics project in each of the three major industries. • Summarize the Agile Robotics industry focusing on the local area. • Create an (Excel) project planning checklist (to be used in the Rube Goldberg design challenge). • Develop an (Excel) responsibility matrix (to be used in the Rube Goldberg design challenge). • Design an (Excel) GANTT chart (to be used in the Rube Goldberg design challenge). • Create an Engineering Design Notebook (to be used in the Rube Goldberg design challenge). 	5 Weeks

	<ul style="list-style-type: none"> Function (interact) as part of a project-based engineering team. 	
BUILDING A BOT	<ul style="list-style-type: none"> Implement basic VEX building techniques. Assemble a Squarebot. Plan and demonstrate an adequate and successful parts management strategy. Plan and demonstrate an adequate and successful power management strategy. 	2 Weeks
INTRODUCTION TO AGILE ROBOTIC TASK PLANNING	<ul style="list-style-type: none"> Present an effective proposal to a client in order to procure support for future development. Design, build, and program a robot able to navigate autonomously or by remote control through a model orchard. Strategize about the best way to accomplish a scored task within given resource and performance constraints. 	One Month
INTRODUCTION TO MANIPULATOR DESIGN AND TESTING	<ul style="list-style-type: none"> Build a manipulator arm on the squarebot robot. Maneuver the squarebot robot through the elevate challenge course Total point as the robot scores in different elevate tubes Compete with other classmates during the elevate challenge 	One Month

**Depending on the needs of the class or changes in the school year, the course outline is subject to change.*