

## **Robotics Programming Syllabus**

Schroon Lake Central School  
Spring Semester 2016, ½ Credit High School Level Course  
Teacher: David Jones

### **Course Description**

*Robotics Programming* is a computer science course focused on learning principles of computer software writing through problem solving using robots. Students work to construct robots using Lego EV3 robotics kits. The robots solve problems posed in various challenges. Students learn programming using the Python programming language.



### **Course Objectives**

Students will:

1. write software using Python;
2. collaborate effectively in groups and teams;
3. apply basic engineering design precepts to design of robots for specific activities and scenarios;
4. be generally familiar with robotics history and current events through short bi-weekly readings;
5. develop familiarity with the Linux operating system.

### **Grading**

- 55% robotics challenges
- 35% programming quizzes, readings, weekly team participation, online journal
- 10% interim exam

### **Methodology**

Working in a team is common in the world of work, especially in technology fields. Students will be working in pairs through the course with each pair being allotted one robot kit and one computer.

Students construct robots to succeed at **challenges** of various difficulty levels. There are periodic whole class tutorials in programming throughout the course. Teams have some flexibility in pace generally through the course, developing increasingly sophisticated programming skills as they construct better software to enable robots to deal with more

difficult challenges.

There is one **reading** task every other week on robotics. Readings are selected from current periodicals and some selections from fiction for reflection. Students may complete the reading in class or as homework. Some class discussion on the reading tasks will accompany the periodic tutorials. Response to the reading task will be summary with personal reflection.

Teams are required to maintain a well-organized **journal** of their work online at the class web site. The purpose of the journal is to preserve for future use bits of code or important principles and lessons learned from the hands-on work of each class period. Journal entries are completed by the **end of each class period**.

There will a programming quiz **every other week** (opposite the weeks when readings are due) to assess students' programming knowledge. These are either in multiple-choice format or practical tests of writing software code in Python.

### **Details for Students**

It is important for participants to realize that, although there is some whole-group instruction, this is primarily a problem-solving course. The instructor has amassed a collection of resources for students to access to solve the problems raised by each challenge. The teacher will not solve these problems for you, since this would defeat the purpose of the course and make it impossible for teams to go at their own pace.

The teacher will give you suggestions for research, possible approaches, maybe pointers from when he or others accomplished the challenge before. However, it is unreasonable for you to expect to be guided out of every problem by the hand.