

Virginia Western Community College

EGR 198

Seminar in Robotics

Prerequisites

None

Course Description:

Dual Enrollment Only

Requires completion of a project or research report related to the student's occupational objectives and a study of approaches to the selection and pursuit of career opportunities in the field. May be repeated for credit. Variable hours. Students are required to design, construct, and build an autonomous robot for VWCC's fall autonomous robotics competition.

Semester Credits: 1 Lecture Hours: 1 Lab/Recitation Hours: 1

Required Materials

Textbook:

No textbook required.

Other Required Materials:

Parallax Boe-Bot Robotics Manual found at:

http://www.parallax.com/Portals/0/Downloads/docs/books/edu/Roboticsv2_2.pdf

Robotics PBASIC Editor Software found at:

<http://www.parallax.com/tabid/441/Default.aspx>

If using the Parallax Activity-Bot Robot based on the Propeller chip, the Manual is found online at:

<http://learn.parallax.com/ActivityBot>

The programming tool for the Propeller chip, SimpleIDE, can be installed from Parallax, using:

<http://learn.parallax.com/propeller-c-set-simpleide>

The Arduino software can be downloaded at:

<http://arduino.cc/en/Main/Software>

Course Outcomes

At the completion of this course, the student should be able to:

1. Construct, program, and test a robot.
2. Use CAD to design the components of a robot.
3. Write a technical report for an engineering design project.
4. Give a technical presentation for an engineering design project.

Topical Description

| Week # | Topic | Parallax |
|--------|---|----------|
| 1 | Kits, Introduction to BASIC Programming Language | |
| 2 | Introduction to the Boe-Bot Robot | 1 |
| 3 | Servo Motors, Team Assignments | 2 |
| 4 | Assembly & Test Boe-Bot, Team Assignments | 3 |
| 5 | Boe-Bot Navigation | 4 |
| 6 | Line Following | On-Line |
| 7 | Trial 1, Ping Sensors | On-Line |
| 8 | Design Procedure. Robot Design for Competition | |
| 9 | Trial 2 | |
| 10 | Design and Design Review | |
| 11 | Design, Construction, Testing | |
| 12 | Design, Construction, Testing | |
| 13 | Design, Construction, Testing | |
| 14 | Testing. Poster Board Presentation, Competition, Dec. 3 | |
| 15 | Lessons Learned. Clean-up | |
| 16 | Finals | |

If using Parallax Activity Bot (Propeller chipset) or Arduino robot kits which use the C or C++ programming language instead of the Parallax Boe-Bot robot kit which uses the PBASIC language, equivalent chapters should be covered on the same schedule.

The autonomous robot competition is tentatively schedule to be held in December and attendance by all students is mandatory.

Notes to Instructors

1. All instructors teaching this course will use the same robotics platforms, either Parallax Boe-Bot (PBASIC), Parallax Propeller (C++) or Arduino(C++).
2. Course content within this course may be covered at the instructor's discretion but with all topics being understood.
3. This course and its grades will be structured primarily around the final design project for the fall VWCC Autonomous Robotics competition.
4. Quizzes should be given periodically during the semester to test students' understanding of programming.
5. At the end of the semester, all instructors will give the outcome assessment as it relates to the design project to the program head at the same time they prepare their student final grades. The project is worth 40% of the grade.