Robotics with the Boe-Bot Syllabus with Home

Instructor/Facilitator: Course:

Location: Contact:

Course Description:

Parallax Robotics with the Boe-Bot ™ is a high school level course appropriate for 9th – 12th grade students who are interested in electronics, robotics, and programming. The Parallax Robotics with the Boe-Bot ™ course is designed to build essential STEM related knowledge while building essential 21st century skills such as critical-thinking, collaboration, innovation, communication, self-management, design-thinking, and perseverance.

Parallax Robotics with the Boe-Bot ™ relies heavily on students building their technical literacy by collaboratively constructing understanding of Parallax ™ technical manuals while using critical-thinking skills to design robots in innovative ways; being able to demonstrate their understanding both orally and in writing through reflection on their design and revision process.

Course Objectives:

1. Create, maintain, and work in a safe laboratory environment.
2. Build, design, and program circuits and robots.
3. Have a classroom culture of collaboration, self-management, design-thinking, innovation, problem-solving, and perseverance.
4. Use reflection and revision to communicate understanding of technical writing.
5. Approach tasks and problems with a mind of inquiry and accomplishment.
6. Look for innovative ways to apply learning to real-world problems through a Project-Based Learning (PBL) approach.

Class Policies:

1. Attendance: Attendance is required in accordance with school policy.
2. Work Ethic: Be prepared to work every class, all class long.
3. Pay Attention: Though much of the class is hands-on, there will be times that the instructor will need to explain or demonstrate. Pay attention for the safety of yourself and those around you.
4. Food or drink: Not allowed. Water is a drink.
5. Electronic Devices: Use of electronic devices must be in accordance with school policy.
6. Computer Use: Computer use, including online access, must follow school policy for computer and internet use.
7. Grading: It will be your responsibility to demonstrate understanding of technical materials, application of course knowledge and skills, as well as critical-thinking, design thinking, collaboration, self-management, and innovation through inquiry, solving problems, and applying learning to real-world applications.
8. Policies and Procedures: It is required that you follow all policies and procedures at all times.

Grading:

Grading policies vary from site to site. We have provided our [Recommended Assessment and Grading Practices](https://docs.google.com/document/d/1b6AOMPaoPqzXMb7fxCQ63514vC60OuHlx-yRMlGtwtk/edit#heading=h.gjdgxs) document as a resource.

Course Topics:

* Software and hardware setup ([download Boe-Bot pdf](https://www.parallax.com/sites/default/files/downloads/28125-Robotics-With-The-Boe-Bot-v3.0.pdf))
* Building, testing, and programming Servo Motors (also found at [Servo on Learn.Parallax.com](http://learn.parallax.com/search?search_api_views_fulltext=servo))
* Assembling the Boe-Bot robot
* Navigating with the Boe-Bot
* Maneuvers, Subroutines, and EEPROM (also found at [Maneuvers on Learn.Parallax.com](http://learn.parallax.com/search?search_api_views_fulltext=maneuvers), & [EEPROM on Learn.Parallax.com](http://learn.parallax.com/search?search_api_views_fulltext=eeprom))
* Making decisions from tactile input (also found at [Whiskers on Learn.Parallax.com](http://learn.parallax.com/search?search_api_views_fulltext=whiskers))
* Measure light with phototransistor & making navigation decisions (also found at [Phototransistor on Learn.Parallax.com](http://learn.parallax.com/search?search_api_views_fulltext=phototransistor))
* Navigating and measuring distance with IR (also found at [IR on Learn.Parallax.com](http://learn.parallax.com/search?search_api_views_fulltext=ir))

Standards:

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| --- | --- | --- | --- | --- |
| **Common Core State Standards (ELA)** | **Common Core State Standards (Math)** | **Next Generation Science Standards (NGSS)** | **Career Technical Education Standards (CTE)** | **21st Century Competencies** |
| CCSS.ELA-LITERACY.RST.9-10.1   * Cite specific textual evidence to support analysis of science and technical texts, attending to precise details of explanations or descriptions   CCSS.ELA-LITERACY.RST.9-10.2   * Determine central ideas or conclusions of a text; trace text’s explanation or depiction of a complex process, phenomenon, or concept; provide accurate summary   CCSS.ELA-LITERACY.RST.9-10.3   * Follow precisely and complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks   CCSS.ELA-LITERACY.RST.9-10.4   * Determine meaning of symbols, key terms, and domain-specific words and phrases in scientific or technical context   CCSS.ELA-LITERACY.RST.9-10.5   * Analyze the structure of the relationships among concepts in a text, including relationships among key terms   CCSS.ELA-LITERACY.RST.9-10.6   * Analyze the author’s purpose in providing an explanation describing a procedure, or discussing an experiment in a text, defining the questions the author seeks to address   CCSS.ELA-LITERACY.RST.9-10.7   * Translate quantitative or technical information expressed in words in a text into visual form and translate information expressed visually or mathematically into words   CCSS.ELA-LITERACY.RST.9-10.8   * Assess the extent to which the reasoning and evidence in a text support the author’s claim or a recommendation for solving a scientific or technical problem   CCSS.ELA-LITERACY.RST.9-10.9   * Compare and contrast findings presented in a text to those from other sources (including own experiments) noting when the findings support or contradict   CCSS.ELA-LITERACY.RST.9-10.10   * Read and comprehend science/technical texts independently and proficiently |  |  | (CRP) Career Ready Practices  *2. Apply academic & technical skills. Career-ready individuals readily access and use the knowledge and skills acquired through experience and education. They make correct insights about when to apply the use of an academic skill.*  (IT) Information Tech Career  *11. Hardware components*  *12. Software functions*  (IT-SUP) Info Support & Services  *4. Installation, configuration*  (IT-PRG) Programming/Software  *4. Software development tools*  *5. Software development process*  *6. Program CPU application*  *7. Software testing*  *8. Quality assurance*  (ST) STEM Careers  *6. Tech skills in STEM* | * Collaborative * Self-directed * Use technology |