Title – Specialty Science Teacher Student Learning Objective

Content Area – Electrical, Robotic, Pre-Engineering

Grade Level – 12th

Students – 22

Interval of Instruction – Year

Main Criteria	Element	Description
Essential Question: What are the most important knowledge/skill(s) I want my students to attain by the end of the interval of instruction?		
Priority of Content	**Objective Statement**	Students will demonstrate an understanding of how to program robots and computers that control manufacturing automation, with an emphasis on the team approach to problem solving in a work environment and utilizing state of the art equipment like the Tetrix Robotic System, Scorbot ER-4 Manipulator, and peripherals that include conveyers, sliders, and turntables.
	Rationale	The learning tasks and skills associated with this Objective Statement must be mastered before moving on to the next level of instruction. As students progress through this curriculum, they will build a foundation of knowledge from which they draw upon when given new tasks in their future careers. The industry requires employees to have all of the problem solving, critical thinking, and team effort skills that are embedded in this objective and the curriculum, and so I will be simultaneously preparing students to be career-ready.
	Aligned Standards	*GSEs* ET2.1 (9-12) Students demonstrate an understanding of the attributes of the design process. ET2.2 (9-12) Students demonstrate an understanding of technological products and systems. R-12-2.1(9-12) Students identify the meaning of unfamiliar vocabulary by using various strategies. M (N&O) -12-7 Students make estimates in situations by determining the level of accuracy. PS2 (9-12) Students demonstrate an understanding of energy by describing changing systems. *Industry Standards* EIA-11M-R Students will develop the abilities to apply the design process. EIA-10- I-L Students will understand troubleshooting, R&D, innovation, and problem-solving *CCSS* SL.11-12.1 Initiate and participate effectively in a range of collaborative discussions with diverse partners on grades 11-12 topics, texts, and issues, building on others' ideas and expressing their own clearly and persuasively.

<table>
<tr><td colspan="3">Essential Question: Where are my students now (at the beginning of instruction) with respect to the objective?</td></tr>
<tr><td></td><td>Baseline Data / Information</td><td>In looking at historical data, I found that 95% of graduating students who have taken the certification tests within the past 3 years have successfully passed. These same students had an average score of 75% on the senior project.

After 4 weeks of introductory work with my current students, this group appears to have a strong set of foundational skills. There are two groups of students who have specific areas of weakness, but I do not believe any will require a corresponding target, but will merely need strategic supports throughout the year.

Group 1: Four of the students have lower math skills and will need additional explanation, re-teaching, or practice.

Group 2: Seven of the students struggle reading informational text and require comprehension strategies and vocabulary support.</td></tr>
<tr><td colspan="3">Essential Question: Based on what I know about my students, where do I expect them to be by the end of the interval of instruction and how will they demonstrate their knowledge/skills?</td></tr>
<tr><td rowspan="2">Rigor of Target</td><td>Target(s)</td><td>A) <u>Certification Tests:</u>
The target is for all students 22/22 (100%) is to successfully pass all of the certifications.

B) <u>Senior Project:</u>
The target is that all teams will score at least 24 points out of a total of 30 possible points (approx. 80%).</td></tr>
<tr><td>Rationale for Target(s)</td><td>A) <u>Certification Tests:</u>
95% of the graduating students who have taken the certification tests within the past years have successfully passed. I believe that with slightly more targeted support, the students and I can reach the 100% mark.

B) <u>Senior Project:</u>
I based my projected targets on the senior projects on performance of past students, though I have raised my expectation from 75% mastery to 80% mastery on the rubric. I believe that the small adjustments that I have made to my curriculum and instruction will enable me to boost student achievement on this project, as compared to last year.</td></tr>
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Quality of Evidence	**Evidence Source(s)**	A) <u>Certification Tests:</u> Seniors are required to take certification tests in various content areas of the curriculum. One of which is the ES-4 Digital Electronics Certification Test. In addition, beginning 2012-2013 students will be given a ES-5 Robotics and Automation Certification Test and a LEAN certification test which signifies training and knowledge in the evaluation of assembly line and manufacturing efficiency. The ES-4 Digital Electronics Certification Test is administered by our school certification coordinator. In addition, the ES-5 Robotics/Automation Certification Test and the LEAN certification test will be given beginning in the 2012-2013 school year. The tests are scored by ISCET and RIMES and results of the certifications are sent to the students as well as the school directly from the nationally headquarters of ISCET and RIMES. B) <u>Senior Project:</u> Students will complete a senior project, in which teams of students are presented with a real world problem in manufacturing engineering and the ROV (Remote Operated Vehicle) Industry and are required to program a robot or computer to address the problem. The project will be assessed on a rubric that is aligned to industry standards (4 domains). The rubric also includes a score for working as a member of a team and a score for successfully solving the problem. The Senior Projects will be presented the last month of school. Students will have 3 weeks of class time to work in their groups. Final presentations of their projects will take place the last week of class. The project and project rubric were developed in collaboration with another teacher of this same course in another district. The senior projects will be co-scored by me and a colleague of mine with a strong background in this content area.