Three Rivers School District

PLANNED COURSE STATEMENT

Arial 12

Course Title: **ROBOTICS**	**Grade Level(s):** 9-12
Length of Course: 1 trimester	**Credit Area:** Science
Prerequisite: Science Exploration: Physics	**Amount of Credit:** 0.5 Credit
Adopted/Supplemental Materials: None	
Dual Credit Articulation:	

COURSE DESCRIPTION:
The objective of this course is to use a hands-on approach to introduce the basic concepts in robotics, focusing on micro controllers, autonomous mobile robots and real world applications. Information presented in class will be linked to lab-based engineering activities & projects. Students will work in teams to build and test increasingly more complex LEGO-based mobile robots. Students will apply what they have learned through a series of robot contests & projects.

COURSE GOALS:
Students will:

1. Use NXT computer programming to program Lego robots to complete tasks & challenges.
2. Define a challenge, analyze the challenges & problems, create and test possible solutions.
3. Use the data from the possible solutions and decide on the best solution.
4. Test and analyze the best solution and refine as needed.
5. Justify the best solution using data through written reports and/or oral presentations.
6. Apply the laws of motion to the robotic tasks & challenges and explain how forces influence the motion of the robot.
7. Research and explain how technological advances have changed the job market and the creation of new careers.

ASSESSMENT STRATEGIES:
Daily work, starter & exit activities, participation, written exams, written results of lab-based engineering activities & projects, oral and written student presentations on specific concepts & processes, notebook including daily notes.

ACCOMMODATIONS AND MODIFICATIONS:
Any student who feels the course is moving too slowly and demonstrates master of the subject matter by consistently exceeding expectations for regular assignments is encouraged to meet with the teacher for more rigorous assignments and projects. More rigorous work will include alternate assignments and projects, NOT ADDED ASSIGNMENTS. Work will be graded using the same standards for work completed by other students in the class. Conversely, a student with an IEP who needs more time to complete the work may have assignments modified to meet his/her needs.

CAREER RELATED LEARNING STANDARDS:
Students will demonstrate appropriate workplace behaviors (e.g. maintain regular attendance and be on time), apply decision-making and problem-solving techniques, demonstrate effective teamwork, apply the principles of effective communication to give and receive information, acquire, use and transfer information, assess the relationship of educational achievement to career goals, research and analyze career options, assess characteristics related to personal, educational, and career goals, demonstrate academic knowledge and technical skills required for successful employment.

OR STATE STANDARDS:

H4D1. Define a problem and specify criteria for a solution within specific constraints or limits based on science principles. Generate several possible solutions to a problem and use the concept of trade-offs to compare them in terms of criteria and constraints.

H4D2. Create and test or otherwise analyze at least one of the more promising solutions. Collect and process relevant data. Incorporate modifications based on data from testing or other analysis.

H4D3. Analyze data, identify uncertainties, and display data so that the implications for the solution being tested are clear.

H4D4. Recommend a proposed solution, identify its strengths and weaknesses, and describe how it is better than alternative designs. Identify further engineering that might be done to refine the recommendations.

H2P4. Apply the laws of motion and gravitation to describe the interaction of forces acting on an object and the resultant motion.

H3S5. Explain how technological problems and advances create a demand for new scientific knowledge and how new knowledge enables the creation of new technologies.