LEGO Robot

Problem Solving skills

Creativity

Teamwork/team learning

Leadership

Communication

Uses skills such as

Deliverables

has

demonstrate

uses technical skills and HW/SW such as

leadership

uses skills such as

uses such as

Engineering/Scientific Method

which implement

Problem Solving skills

Communication

Leadership

Teamwork/team learning

Creativity

Deliverables

Hands on Experience

Uses skills such as

Creative

Comprehending/following instructions

programming

designing

implementation

sensors

which result in

Oral Presentation

Reports

Working Robot Demo

Hands on Experience

uses technical skills and HW/SW such as

which are validated by evaluation
Engineering Problem Solving

- Recognize the problem
- Define the problem
- Brainstorm possible solutions
- Consider the consequences of each solution and pick the optimum one
- Implement the optimum solution
- Evaluate the results
- Repeat to improve, if necessary

Scientific Method of Problem Solving

- Hypothesis
- Perform Experiments
- Collect and analyze data
- Make conclusions
- Modify hypothesis and repeat if necessary
Demonstration of Effective Communication Skills

- Oral Presentation
- Written Report
- Understanding and Following Instructions
- Demonstration and defense of the final product (robot)
Use and Demonstration of Creativity in Engineering

- Creative problem solving
- Unique HW Design and implementation (robot)
- Unique SW Design and implementation (robot control program)
- Interesting and engaging presentations
SENSORS

Use

• Touch sensors
• Light sensors

Understand

• Pressure sensors
• Temperature sensors
• Chemical sensors
• Machine vision
• Wind (draft)
Programming Concepts and Related Skills

- Understanding and using modular programming
- Designing the program to follow a required logic (flow chart)
- Programming Robotics Invention System Ver. 2.0 software tool
Comprehending/Following Instructions

- Understanding assignment
- Understanding deliverables
- Following the outlined procedure for creating the robot
- Following the appropriate procedure to write the motion control program
- Understanding and following instructions for proper report format and content
- Understanding and following instructions for proper oral presentation
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