**TEJ2O Robotics unit summative assignment**

****

Students will work in their groups to complete the summative for the robotics unit.

Research in their groups to build a prototype /working model of a robot using resources and materials available such as sensors,servo motors and attachments.Students can also use arduino boards and breadboards to build their model.

Each robot will be designed to perform a certain function and will address any one or two of the 17 [UN sustainability goals.](https://sdgs.un.org/goals)

Students will maintain individual engineering notebooks throughout this unit and will also document their project in a **group** section of the notebook( can be handed as one) according to the rubric.

**Engineering notebook rubric**

| **Criteria** | **Novice (1)** | **Emerging (2)** | **Proficient (3)** | **Expert (4)** |
| --- | --- | --- | --- | --- |
| Engineering Notebook is clear, organized, & complete, including:   * Team Profile * Projects and team assignments * Entries from team meetings with goals, decisions, and accomplishments * Record name or initials & dates | Engineering Notebook includes minimal clarity, organization, and/or listed content | Engineering Notebook is somewhat clear and organized and includes some of the listed content | Engineering Notebook is clear and organized and includes most of the listed content | Engineering Notebook is very clear, well organized, and complete, including all of the listed content |
| Engineering Notebook documents the Design Process steps:   * Identify the challenge(s) * Brainstorm solutions * Select best approach and plan * Build, program, and test * Repeat process steps, if needed | Engineering Notebook documents minimal Design Process steps | Engineering Notebook documents some Design Process steps | Engineering Notebook documents most Design Process steps | Engineering Notebook thoroughly documents all Design Process steps |
| Team understands and explains how they developed an effective game strategy and robot design | Team explains strategy and design with minimal understanding | Team explains strategy and design with some understanding | Team explains strategy and design with good understanding | Team explains strategy & design with enhanced depth of understanding |
| Team demonstrates effective management of skills, time, and material resources, e.g., develops goals and timelines, plans schedule and tasks, assigns team roles | Team demonstrates minimal management of resources | Team demonstrates some management of resources | Team demonstrates good management of resources | Team demonstrates effective management of all resources |
| Team understands and explains how they worked together to design, build, and program their robot. | Team explains their cooperative robot design process, with minimal understanding | Team explains their cooperative robot design process, with some understanding | Team explains their cooperative robot design process, with good understanding | Team explains their cooperative robot design process, with enhanced depth of understanding |

**Robot Rubric**

| **Name:** | **Below Basic** | **Basic** | **Proficient** | **Advanced** |
| --- | --- | --- | --- | --- |
| Robustness: How tough your robot is. | Frail, fell apart during the challenge, unable to continue. | A few parts fell off, but was still able to function. | Able to perform its task and survive the challenge intact. | Solid build with no chance of ever falling apart. |
| Functionality: How well your robot works. | Hardware and software not working well together, the program doesn’t control most parts. | Program controls most of the hardware, but some parts didn’t work or weren’t used by the program. | Program uses the parts as intended; parts do what they’re programmed to. | Program uses all parts and is flexible enough to allow parts to be added and used as necessary. |
| Program: How well your program was designed. | Overly simple or non-functioning, missing key elements. | Basic, meets most requirements, not able to react to changes. | Meets all required needs, reacts to some change, but not everything. | Reacts to unpredictable changes, functions flawlessly. |
| Mechanics: How well the moving parts of your robot worked. | No use of simple machines. Not able to move well, clunky. | Uses gears and other mechanical advantages, but problems still moving. | Uses gears and other mechanical advantages, runs smoothly. | Uses ancillary structures (arms etc.) to get an advantage, maximizes efficiency of gears and other mechanical advantages, flawless movement. |
| Efficiency: How well your robot used the hardware and software resources available. | No use loops or switches blocks. Constructed robot with more pieces than required. | Used simple loops, but not switches. Constructed robot with only simple pieces. | Used complex loops and switches. Constructed robot with some complex joints and connectors. | Used complex loops, switches, data wires, and variables. Constructed robot with complex pieces to minimize the number of components. |

**Presentation**

Presentation will include a Tri-Fold/ media presentation which describes their project, a live demonstration of their projects to an audience(tech fair- proposed day 15th and 16th Jan 2024).

**Checklist**

Complete information includes the purpose and function of the robot.

The UN sustainability goal has been addressed.

Presentation information is clear and precise.

**Post project reflection**

Students will complete google form and reflect upon their individual contributions, achievement and challenges they have faced during the build.