*Unit 8 Project Management in Robotics

Content Area: **Technology**
Course(s): **Robotics**
Time Period: **April**
Length: **20 blocks**
Status: **Published**

Transfer Skills

Effective project management in robotics is a practice in systems engineering where multiple disciplines need to interact in harmony with one another in order for each individual system to function appropriately.

Enduring Understandings

1. The completion of a long-term group project requires members to work as a team.

2. Each team member should have a set of tasks they are responsible for.

3. Project managers should oversee all operations to ensure that all systems function correctly and cohesively.

4. Projects are completed in stages and each stage has its own set of goals, steps, requirements, etc.

5. A complex robotic system requires the integration of many different fields of engineering.

6. A team of individuals working on a complex robotic system requires each person to contribute in a specific area.

7. Developing a timeline can establish the critical path which is the sequence of stages determining the minimum time needed for an operation.

Essential Questions

1. What are the characteristics of a good team member?

2. How does team work within a group relate to project success?

3. How can project managers keep their team members on track?

4. Why is it important to break up a large project into separate stages?

5. How does a group dynamic affect the overall outcome of a project?

Content

Vocabulary: Systems engineering, Process, Trade-off, Value, Interdisciplinary, Gantt chart, Constraints, Critical path, Deliverable, Project manager, Functional manager, Life cycle, Stakeholder, Workplan

Skills

1. Work within a team to develop a plan for a long-term robotics project.

2. Independently develop a solution for a particular part of a robot design.

3. Document, through journal entries, engineering portfolios, etc., the design process used to complete a long-term robotics project.

4. Present, both prepared and impromptu, proposed and completed ideas to small group and whole class audiences.

Resources

Desktop computers

Programming software

Robotics platform compatible with software

Robotics peripherals

Robotics sensors

Laser cutter

3D printer

CNC router

Prototyping tools

Prototyping materials

Standards

TECH.8.2.12.C.4	Explain and identify interdependent systems and their functions.
TECH.8.2.12.C.7	Use a design process to devise a technological product or system that addresses a global

	problem, provide research, identify trade-offs and constraints, and document the process through drawings that include data and materials.
TECH.8.2.12.C.CS2	The application of engineering design.
TECH.8.2.12.C.CS3	The role of troubleshooting, research and development, invention and innovation and experimentation in problem solving.
TECH.8.2.12.D.1	Design and create a prototype to solve a real world problem using a design process, identify constraints addressed during the creation of the prototype, identify trade-offs made, and present the solution for peer review.
TECH.8.2.12.D.3	Determine and use the appropriate resources (e.g., CNC (Computer Numerical Control) equipment, 3D printers, CAD software) in the design, development and creation of a technological product or system.
TECH.8.2.12.D.CS1	Apply the design process.
TECH.8.2.12.D.CS2	Use and maintain technological products and systems.
TECH.8.2.12.E.1	Demonstrate an understanding of the problem-solving capacity of computers in our world.
TECH.8.2.12.E.3	Use a programming language to solve problems or accomplish a task (e.g., robotic functions, website designs, applications, and games).
TECH.8.2.12.E.4	Use appropriate terms in conversation (e.g., troubleshooting, peripherals, diagnostic software, GUI, abstraction, variables, data types and conditional statements).
TECH.8.2.12.E.CS1	Computational thinking and computer programming as tools used in design and engineering.