Future Engineers 2027- Documentation Rubric

1 Mechanical Design, Mobility and Manipulation

WHAT IS EVALUATED	WHAT EVALUATORS ARE LOOKING FOR
Chassis, mobility, manipulation mechanisms, accuracy and stability.	Justified design choices, technical understanding, testing and improvement.

A: 20 pts	B: 15 pts	C: 10 pts	D: 0 pts
Design decisions justified using dimensions, torque, speed, stability and accuracy considerations. Alternatives and trade-offs discussed. Testing and iterations demonstrate improvements.	Chassis, drive system and manipulation mechanisms clearly explained with photographs, diagrams or drawings. Main choices described. Mechanical system reproducible.	Main components and mechanisms described, but reasoning, dimensions, diagrams or testing are incomplete.	No meaningful information about mechanical design, mobility or manipulation.

2 Power, Electronics and Sensor Architecture

WHAT IS EVALUATED	WHAT EVALUATORS ARE LOOKING FOR
Power supply, batteries, controllers, onboard computers, wiring, electronic interfaces, sensor selection and placement, calibration and reliability.	Well-planned power and electronic architecture, justified sensor choices, understanding of sensor limitations and evidence of calibration and testing.

A: 20 pts	B: 15 pts	C: 10 pts	D: 0 pts
Complete architecture justified. Power consumption, sensor trade-offs, placement and calibration explained. Failure modes considered and reliability improvements demonstrated.	Clear wiring or system diagrams. Power supply, controllers, interfaces and sensors explained. Sensor selection and placement described. System reproducible.	Components are listed, but diagrams, calibration, power reasoning or design justification are incomplete.	No meaningful information about electronics, power or sensors.

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3 Software Architecture, Autonomous Navigation and Perception

WHAT IS EVALUATED

Software structure, control logic, navigation and route planning, localization, environmental perception, object recognition, manipulation control and mission strategy.

WHAT EVALUATORS ARE LOOKING FOR

Clear explanation of algorithms and autonomous behaviour, processing of environmental information, mission logic, handling of unexpected situations and testing.

A: 20 pts	B: 15 pts	C: 10 pts	D: 0 pts
Well-structured and justified software architecture. Algorithms and autonomous strategy explained. Edge cases and recovery behaviour addressed. Testing, tuning and performance metrics documented.	Flowchart, state machine or architecture diagram provided. Main modules explained. Navigation, perception and mission strategy understandable and reproducible.	Basic software and mission description, but architecture, algorithms, logic or testing are incomplete or unclear.	Source code without meaningful explanation, or autonomous strategy cannot be understood.

4 Systems Integration, Testing and Engineering Decisions

WHAT IS EVALUATED

Integration of mechanical, electronic and software systems, engineering constraints, design alternatives, trade-offs, testing, iterations, failures and risk mitigation.

WHAT EVALUATORS ARE LOOKING FOR

Evidence of a structured engineering process, understanding of subsystem interactions, justified design decisions and improvements based on testing.

A: 20 pts	B: 15 pts	C: 10 pts	D: 0 pts
Integrated system clearly explained. Constraints, alternatives and trade-offs identified. Decisions supported by measurements or tests. Iterations, failures, risks and corrective actions documented.	Main subsystems and interactions explained. Relevant constraints, tests, modifications and decisions described, with some limited analysis.	Some decisions, tests or modifications described, but reasoning is incomplete. Subsystem interactions are unclear.	No meaningful evidence of integration, testing or engineering decisions.

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5 Reproducibility, Documentation and Repository Quality

WHAT IS EVALUATED

Documentation clarity, GitHub structure, README, source-code completeness, commit history, technical files, setup instructions, version identification and reproducibility.

WHAT EVALUATORS ARE LOOKING FOR

Public and accessible materials, meaningful development history, clear instructions, relevant technical files, and sufficient information to reproduce the robotic system.

A: 20 pts	B: 15 pts	C: 10 pts	D: 0 pts
Complete, well-organized documentation and repository. Relevant code, configurations, diagrams and manufacturing files included. Meaningful version history and clear competition version. System fully reproducible with minimal additional information.	Clear documentation and repository with essential code, technical files and instructions. Required meaningful commits included. System reproducible with reasonable effort.	Repository and documentation exist, but structure, files, links or instructions are incomplete. Reproducibility is limited.	Documentation or repository missing, inaccessible or too incomplete for meaningful evaluation.

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