



Smart World Cup

SWC 2025

GENERAL GUIDELINE

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1. General Information

1.1. Smart World Cup (SWC) 2025

The Smart World Cup (SWC) is an exciting new competition co-organized by Temasek Polytechnic and EP Education. This competition is designed to challenge students and young innovators to solve real-world problems and develop innovative solutions using the Smart World Kit. The SWC aims to inspire creativity, foster critical thinking, and promote the application of STEM (Science, Technology, Engineering, and Mathematics) knowledge in meaningful and impactful ways.

At the heart of the Smart World Cup is the Smart World Kit, a versatile educational tool that includes a range of sensors, actuators, and microcontrollers. Participants will use this kit to conceptualize, design, and build their projects. The Smart World Kit provides the perfect platform for exploring a variety of themes related to current and future challenges.

Participating in the Smart World Cup offers participants a rich learning experience, including:

- **Problem-Solving Skills:** Participants will tackle real-world challenges and develop innovative solutions within their chosen theme.
- **Technical Knowledge:** Hands-on experience with the Smart World Kit helps participants understand sensors, microcontrollers, and coding.
- **Critical Thinking:** Encourages analytical and strategic thinking to create impactful projects.
- **Teamwork and Collaboration:** Participants work in teams, honing their communication and teamwork abilities.
- **Entrepreneurial Mindset:** The competition fosters creativity and innovation, preparing participants to bring their ideas to market.
- **Presentation Skills:** Students will learn how to effectively showcase their projects and ideas to judges and audiences.

SWC 2025 competition comprise:

- SWC Open Category
- SWC Robotics Category
 - RoboCrash Subcategory
 - Search & Rescue Subcategory
- SWC AI Innovation Challenge Category
- SWC Master STEM Hackathon Category

- SWC Gaming Category

1.2. Theme for SWC 2025

The theme for the Smart World Cup 2025 is SG60, celebrating Singapore's 60th anniversary of independence. SG60 challenges participants to imagine and create a smarter, more sustainable, and innovative future for Singapore as it moves towards its next chapter. Participants will design solutions that address national priorities, embrace emerging technologies, and contribute to the vision of a thriving, inclusive, and forward-thinking nation.

Projects can explore areas such as smart infrastructure, sustainable living, future transportation, and enhanced quality of life, reflecting the spirit of progress and resilience that defines Singapore. Let your creativity and innovation shine as we shape the future of SG60 together!

2. SWC Categories

2.1. SWC Open Category

2.1.1. Category Definition

Each team will have a minimum of 2 members and up to 4 members.

This category is open to the following age groups:

- Primary: students 7-12 years old
- Secondary: students 13-16 years old
- Tertiary: students 16-19 years old

The Open Category is designed for participants who wish to explore advanced and creative applications of AI and IoT using the Smart World Kit. This category encourages innovative problem-solving beyond structured themes, allowing for unique, real-world applications.

Participants are free to develop projects in areas such as:

- **Smart Cities** (e.g., traffic optimization, energy efficiency)
- **Healthcare & Well-being** (e.g., sensor monitoring systems)
- **Environment & Sustainability** (e.g., pollution tracking, smart farming)
- **Automation & Robotics** (e.g., home automation, assistive robots)
- **Education & Community Impact** (e.g., learning tools, accessibility solutions)

2.2. SWC Robotics Category

2.2.1. Category Definition

Each team will have a minimum of 2 members and up to 4 members.

This category comprises 2 subcategories.

This category is open to the following age groups:

- Secondary: students 13-16 years old
- Tertiary: students 16-19 years old

2.2.2. SWC RoboCrash Subcategory

The RoboCrash Category is a competitive robotics challenge where participants design, build, and remotely controlled robots using the Smart World Kit to engage in a controlled collision-based battle and obstacle challenge.

The goal is to test engineering, AI-driven automation, and strategic design while ensuring that robots can withstand impacts, manoeuvre efficiently, and utilize smart AI-based tactics to outlast or outperform opponents.

Participants may incorporate:

- **AI-based decision-making** (e.g., obstacle detection, adaptive movement strategies)
- **Autonomous or semi-autonomous control** (e.g., sensor-based reactions, self-balancing mechanisms)
- **Durability and structure engineering** (e.g., impact-resistant designs)
- **Speed and agility** (e.g., manoeuvring through obstacles or engaging in battle challenges)

2.2.3. Search & Rescue Subcategory

The Search and Rescue Robotics Category challenges participants to design, build, and program a robot using the Smart World Kit to navigate a dark, enclosed cave-like environment and complete mission-based rescue tasks.

Robots must be capable of manoeuvring through tight spaces, overcoming obstacles, and utilizing AI-driven sensing and automation to locate and assist in simulated rescue scenarios. This category emphasizes real-world applications of robotics in disaster response, emergency rescue, and autonomous exploration.

Key Challenges

- **Navigation in Darkness:** Robots must operate in a low-light or no-light environment.
- **Obstacle Avoidance:** Ability to detect and avoid debris, walls, and rough terrain.
- **Search Missions:** Locating objects or "victims" (e.g. RFID tags, or QR codes).
- **Rescue Mechanism:** Delivering supplies, sending signals, or guiding an evacuation route.
- **Autonomous Functionality:** AI-driven decision-making to adjust to changing environments

2.3. SWC AI Innovation Challenge Category

2.3.1. Category Definition

Each team will have a minimum of 2 members and up to 4 members.

The AI Innovation Challenge category is designed for participants to explore the power of Artificial Intelligence (AI) in robotics and IoT using the Smart World Kit. This category focuses on AI-driven automation, decision-making, and data analysis, encouraging participants to develop intelligent systems that can adapt, learn, and interact with their environment.

Participants are expected to create projects where AI plays a key role in processing data, making autonomous decisions, optimizing performance, or solving real-world

problems. The challenge aims to bridge AI and robotics, demonstrating how AI can be effectively integrated into embedded systems to enhance functionality, efficiency, and problem-solving capabilities.

Possible Project Applications:

- **AI-Assisted Navigation** – Robots using AI to move autonomously, avoiding obstacles, and finding optimal paths.
- **Smart AI Monitoring** – AI-powered environmental analysis (e.g., detecting air quality, temperature trends, or predicting weather conditions).
- **AI-Driven Automation** – Machines that learn user behavior and automate repetitive tasks.
- **AI for Assistive Technology** – AI-enhanced solutions for accessibility (e.g., voice-controlled robotics, gesture recognition).
- **Predictive AI Systems** – AI models that forecast trends based on real-time sensor data.

2.4. SWC Master STEM Hackathon Category

2.4.1. Category Definition

The Master STEM Category is an intensive, innovation-driven challenge where participants must design, prototype, and showcase a functional STEM solution using the Smart World Kit within a limited time frame. This category tests creativity, problem-solving skills, and technical expertise under hackathon conditions, where participants must rapidly develop and refine their ideas to address real-world challenges.

The challenge is theme-based, requiring participants to brainstorm, prototype, and present their solutions within a given time constraint. Teams must apply AI, robotics, and IoT concepts to develop impactful projects that demonstrate technological innovation and practical application.

Key Elements:

- **Time-Bound Innovation** – Teams must develop their solutions within the allocated hackathon period.
- **Theme-Based Challenge** – A specific problem statement or theme will be revealed at the start.

- **Rapid Prototyping** – Participants must build and demonstrate a working prototype using the provided tools.
- **AI & IoT Integration** – The project must showcase how AI and smart systems can solve the given challenge.
- **Pitch & Presentation** – Teams will present their ideas and working prototypes to a panel of judges.

3. Registration

Registration Period

- **Opening Date:** 02 February 2025
- **Closing Date:** 20 May 2025 (One week before the competition)
- Late registrations will not be accepted after the deadline.

Who Can Register?

- Open to students, hobbyists, and STEM enthusiasts.
- Participants must use the Smart World Kit with Micro:bit for their projects.

Registration Process

- Fill out the online registration form at <https://www.stemacademy.sg/smart-world-cup/>
- Submit the form before 20 May 2025.

Team Registration Rules

- A team can have up to 4 members.
- Each participant can only join one team and compete in one category.
- Teams must designate a team leader for communication purposes.

Confirmation & Participation

- Once registered, participants will receive a confirmation email with:
 - Competition details
 - Submission guidelines
 - Event schedule
- If you do not receive confirmation within 48 hours, email pengyu@epasia.cc or call +65 84382848

Competition Fees

- **Registration Fee:** Free of charge

Cancellation & Replacement Policy

- If a registered participant or team cannot compete, they must notify organizers at least 5 days before the event (by 22 May 2025).

- Team member replacements are allowed before 22 May 2025, but not on competition day.

Competition Day Check-in

- All participants must check in on 27 or 28 May 2025, at Temasek Convention Centre (TCC) Blk 34 - Temasek Polytechnic, 21 Tampines Avenue 1 529757
- Teams that fail to check in within the first 30 minutes will be disqualified unless prior notice is given.

4. Competition General Rules

4.1. Originality & Ethics

- All projects must be original creations of the participants.
- Plagiarism or reusing previously published work (including past competition entries) is strictly prohibited.
- AI-generated content must be participant-driven (e.g., AI can assist, but the core idea, development, and implementation must be the work of the participants).
- If a project is found to be copied or pre-trained AI models are used without modification, it will lead to immediate disqualification.

4.2. Adherence to Theme & Format

- Projects must align with the chosen category and extra points will be awarded if align with the competition theme.
- Participants must use the Smart World Kit with Micro:bit as the core hardware.
- Submissions must follow all documentation and format guidelines, including:
 - Project write-up
 - Video demonstration
 - Code submission (if applicable)

4.3. Disqualification Conditions

A team or participant will be disqualified if they:

- Submit work that is plagiarized, AI-generated without human contribution, or pre-published.
- Fail to check in within 30 minutes of competition start time.
- Use unauthorized hardware/software that violates competition requirements.
- Engage in dishonest behavior, such as sabotaging other teams' projects.
- Do not meet submission deadlines or fail to provide required documentation.

- Disrupt competition proceedings with inappropriate behavior (e.g., disrespectful conduct, breaking event rules).

5. Code of Conduct

The STEM Competition using the Smart World Kit & Micro:bit is designed to foster innovation, teamwork, and ethical competition. All participants, mentors, and judges are expected to adhere to the following guidelines to ensure a fair and respectful environment.

5.1. Respect & Fair Play

- Treat fellow participants, judges, and organizers with respect and professionalism.
- No harassment, discrimination, or inappropriate behavior will be tolerated.
- Avoid any actions that may disrupt or sabotage another team's project.

5.2. Ethical Participation

- All work submitted must be original and created by the participants.
- Plagiarism, falsification of data, or unauthorized use of AI-generated content is strictly prohibited.
- AI models must be transparently documented, showing participant contributions.

5.3. Collaboration & Teamwork

- Teams must work collaboratively and give credit to all members' contributions.
- Mentors and external advisors may guide but should not contribute directly to the project's development.

5.4. Safety & Responsible Use of Technology

- Projects must adhere to safety standards and not pose any harm to participants or others.
- AI and robotics must be used ethically—projects promoting violence, invasion of privacy, or malicious intent will be disqualified.

5.5. Competition Integrity

- Participants must adhere to deadlines and follow submission guidelines.
- Any form of cheating, misrepresentation, or rule-breaking will result in immediate disqualification.
- Judges' decisions are final, and participants must accept results with good sportsmanship.

5.6. Reporting Violations

- If any participant witnesses' misconduct or rule violations, they should report it to the competition organizers immediately.
- The organizers reserve the right to disqualify or act against anyone violating the code of conduct.

By participating in the competition, all participants agree to abide by this Code of Conduct and ensure a fair, ethical, and respectful competition environment.

6. Awards & Prizes

Each category will have the following awards:

Championship Award

- Awarded to the best-performing team in each category based on overall excellence in innovation, technical execution, and impact.
- Prize: Trophy, Certificate, and a Conditional Offer Letter for Early Admission Exercise from Temasek Polytechnic (TP) for the Champion Team (*subject to TP's admission criteria and review process*).

2nd Place Award

- Awarded to the runner-up team with an outstanding project that demonstrates creativity and strong technical skills.
- **Prize:** Trophy & Certificate.

3rd Place Award

- Given to the third-highest scoring team that showcased impressive problem-solving and implementation.
- Prize: Trophy & Certificate.

Judges' Award

- Special recognition for teams that demonstrated exceptional creativity, problem-solving, or outstanding teamwork, as chosen by the judging panel.
- Prize: Medal & Certificate of Achievement.

Certificates of Participation

- All participants who complete the competition and submit their projects will receive an Official Certificate of Participation.

7. Contact Information

- For any inquiries, email us at: pengyu@epasia.cc
- Visit our website: <https://www.stemacademy.sg/smart-world-cup/>
- Call or WhatsApp us at: +65 84382848