WRO 2024: World Robot Olympiad 2024

THEME: EARTH ALLIES



1. About WRO

World Robot Olympiad™ was founded in 2004. The mission statement of our founders was:

"To bring together young people all over the world to develop their creativity, design and problem-solving skills through challenging and educational robot competitions and activities."

It was decided that the annual WRO international final would be hosted by a different country each year. In 2004, the event was hosted by Singapore and 12 countries participated. In 2019, fifteen years later, teams from 73 countries travelled to GyŐr in Hungary for the international final!

Today, the competition that started small in a few Asian countries has expanded to over 85 countries spread over all continents, making WRO a truly global event.

Since 2010 World Robot Olympiad Association Ltd. is officially registered as a legal entity with the Accounting and Corporate Regulatory Authority (ACRA) in Singapore.

2. WRO® operates on, is measured on and strives towards the following **Values**:

DIVERSITY: WRO is accessible to young people from around the world, regardless of background

TEAMWORK: Our teams succeed by embracing collaboration and build friendships, integrity and character in the process

PASSION: Learning occurs naturally when participants are in flow and having fun when engaged in our activities

INNOVATION: Our programs are innovative and hands-on, based around trending topics and technologies

EMPOWERMENT: We inspire and prepare young people to be digital pioneers, innovators and engineers

3. Schedule

Competition	Date	Location	Category
Northern	29 – 30 June 2024	Dipangkorn Rasmijoti Convention Hall, Chiang Mai Rajabhat University, Mae Rim District	ROBOMISSION
North-Eastern	27 – 28 July 2024	Kasetsart University Chalermphrakiat Sakon Nakhon Province Campus.	
Southern	3 – 4 August 2024	Central Hatyai	
Central	17 – 18 August 2024	Central Siracha	
Special League	22 – 23 August 2024	Rajamangala University of Technology Rattanakosin	- ROBOSPORTS - FUTURE ENGINEERS - FUTURE INNOVATORS
WRO Final	13 – 15 September 2024	The Mall Korat	ROBOMISSION

4. Category

At WRO® we offer challenging competitions for students in the age range from 8 up to 19. We have 4 competition categories, each with their own characteristics.

4.1 ROBOMISSION

Age: Elementary: 8-12 | Junior: 11-15 | Senior: 14-19

Team size: 2-3 people guided by a coach.

Hardware: LEGO® based

Software: Free choice

Maximum size: Max. 25 x 25 x 25 cm

Characteristics: Build and program a robot that solves challenges on a field.

4.2 ROBOSPORTS

Age: 11-19

Team size: 2-3 people guided by a coach.

Hardware: Free choice, with LEGO® or Arduino controller

Software: Free choice

Maximum size: Max. 20 x 20 x 20 cm

Characteristics: Teams design 2 robots that compete with robots of another team.

4.3 FUTURE INNOVATORS

Age: Elementary: 8-12 | Junior: 11-15 | Senior: 14-19

Team size: 2-3 people guided by a coach.

Hardware: Free choice*

Software: Free choice

Maximum size: Must fit in 2x2x2m booth.

Characteristics: Develop a robot project that helps solve real world problems.

4.4 FUTURE ENGINEERS

Age: 14-19

Team size: 2-3 students guided by a coach.

Hardware: Free choice

Software: Free choice

Maximum size: Max. 30 x 20 x 30cm

Characteristics: Advanced robotics following current research trends.

5. Competition characteristics

5.1 WRO® **RoboMission** is a challenge-based competition. Students must design, construct and program an autonomous robot that can solve specific challenges on a field. Because the field is set up randomly each round, the robot needs to be able to make its own decisions during the run. All parts of the robot, including controller, motors and sensors must be from LEGO® (MINDSTORMS® NXT or EV3, SPIKE PRIME or Robot Inventor). For all specific rules and regulations refer to the General Rules for this category.

5.2 With the WRO® **RoboSports** category we introduce a fun and exciting game where two teams each have two autonomous robots on the field playing a sports game. The robot can be built from all materials. The controller can be LEGO® MINDSTORMS® NXT or EV3, SPIKE PRIME or Robot Inventor or an official Arduino Controller. There is no limitation to motors, sensors or cameras used in the robot, but the maximum weight is 1.2 kg. The game changes every 3 or 4 years and the current game is Double Tennis. Each year little changes are introduced to motivate the students to keep on developing their robots. For all specific rules and regulations refer to the General Rules for this category.

5.3 Our **Future Innovators** category is a project-based competition. Students create their own innovative intelligent robotics solution relating to the current theme of the season. There is no restriction on the use of materials. This includes free choice of controllers, motors, sensors, etc.Teams will present their project and their robot model to a group of judges on the competition day. The judges will not only grade the robot solution but will also look at aspects of innovation and entrepreneurship. For all specific rules and regulations refer to the General Rules for this category.

5.4 With WRO® **Future Engineers** we created an exciting category for older students. With this new format, we want to bring the current research challenge into schools and teach students an engineering workflow by solving real-world-problems. Teams can use any robot, controller and materials that are in line with the regulations. The game changes every 3 or 4 years and the current game is all about autonomous driving. The challenge is to build a robot with a steering drive that can drive around a track autonomously. Each year little changes are introduced to motivate the students to keep on developing their robots. For all specific rules and regulations refer to the General Rules for this category.

6. WRO® Guidelines

The regulations for each category are described in the General Rules for that category.

Additional regulations are:

- A team may participate in only one category per season. Any student may participate in one team only.
- The age group defines the maximum age of the student in the calendar year of the competition. (Not their age at the date of a competition.)
- The minimum age of a coach at an international WRO® event is age 18.
- Coaches may work with more than one team.

7. THE WRO® GUIDING PRINCIPLES

We are aware that a competition usually means that those involved are driven to win. This applies to team members, coaches, parents and even to countries. We feel there is nothing wrong with that, as long as the guiding principles of the competition remain intact. We expect all teams and coaches participating in the competition to respect the WRO® Ethics Code.

GUIDING PRINCIPLES & ETHICS CODE

The WRO® Guiding Principles are:

- Teams are encouraged to learn and master new skills while having fun together.
- Coaches, mentors and parents are there to guide the teams, not to do the work for them.
- Participating and learning are more important than winning.

WRO® ETHICS CODE FOR TEAMS

"It is not whether you win or lose, but how much you learn that counts."

We are participating in a competition. We like to win. We want to learn. And we also want to have fun.

We want to play fair. We design our own robot and we write our own software. It is not fair if someone else does that for us. We can only learn if we try things ourselves. Our coach can teach us things and guide us. And we can also get inspired by others. But our coach should not do the work for us. And we do not simply copy a robot or software from someone else. We use the examples we find to design our own robot and programming. Sometimes we fail and that is OK. Original ideas come from failing.

WINNING IS NICE BUT FAILING IS PART OF OUR JOURNEY.

8. Regional classification

- **The North-Eastern Province (Total 20 Provinces)**

  Kalasin, Khon Kaen, Chaiyaphum, Nakhon Phanom, Nakhon Ratchasima, Bueng Kan, Buri Ram, Maha Sarakham, Mukdahan, Yasothon, Roi Et, Loei, Si Sa Ket, Sakon Nakhon, Surin, Nong Khai, Nong Bua Lam Phu, Amnat Charoen, Udon Thani, Ubon Ratchathani.

- **The Central and Eastern Provinces (Total 26 Provinces)**

  Kanchanaburi, Chai Nat, Nakhon Nayok, Nakhon Pathom, Nonthaburi, Pathum Thani, Prachuap Khiri Khan, Phra Nakhon Si Ayutthaya, Phetchaburi, Ratchaburi, Lop Buri, Samut Prakan, Samut Songkhram, Samut Sakhon, Saraburi, Sing Buri, Suphan Buri, Ang Thong, Bangkok, Chanthaburi, Chachoengsao, Chon Buri, Trat, Prachin Buri, Rayong, Sa Kaeo.

- **The Southern Provinces (Total 14 Provinces)**

  Chumphon, Nakhon Si Thammarat, Narathiwat, Pattani, Phang Nga, Phatthalung, Phuket, Songkhla, Surat Thani, Yala, Krabi, Ranong, Satun, Trang

- **The northern Province (Total 17 provinces)**

  Chiang Mai, Lamphun, Lampang, Uttaradit, Phrae, Nan, Phayao, Chiang Rai, Kamphaeng Phet, Nakhon Sawan, Phetchabun, Phichit, Phitsanulok, Sukhothai, Uthai Thani, Tak, Mae Hong Son

9. Eligibility Table

Category	Entry for WRO International Final
RoboMission – Elementary	3 Teams
RoboMission – Junior	3 Teams
RoboMission – Senior	3 Teams
RoboSports	2 Teams
Future Innovators – Elementary	1 Teams
Future Innovators – Junior	1 Teams
Future Innovators – Senior	1 Teams
Future Engineers	2 Teams
Total	**16 Teams**

10. Registration information

- More detail at www.gammaco.co.th/wro
- Registration Fees 400 baht per person (registration fees included: Participation Certificate, 2 meals, 2 bottles of drinking water per day, badge)

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