



International robotic competition „ROBO-VEHICLE PILSEN 2026“ 16 – 18 March 2026

The task of the competition teams will be to construct a robotic vehicle, present it to the jury in English and drive it along a defined track in the fastest time possible. The vehicle will transport a cup with a measured amount of water, which it must not spill. The competition will be held in the categories of the best ride, the best design, the best presentation in English and the overall placement.

The competition will take place in person from 16 to 18 March 2026 in Pilsen.

The aim of the competition is to deepen the cooperation between schools in the area of developing digital competencies needed for the future labor market, to compare professional skills between schools across individual countries and to obtain new inspiration for competing students.

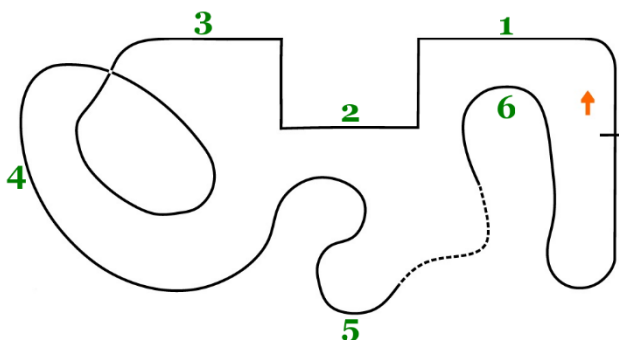
Competition teams

Each invited country can enter a maximum of four teams into the competition. Secondary schools in the Pilsen Region can enter a maximum of two teams into the competition. A team consists of two students from one secondary school under the age of 21. During the competition, teams work independently without the intervention of a teacher or adult.

Technical conditions

Track specification

- 🕒 the background for the track is a white flat sheet with dimensions of 1950 x 4000 mm, on which a closed curved loop is drawn in black - a curved black guiding line 15 mm wide
- 🕒 the start and at the same time the finish is a black START/FINISH line with a width of 15 mm, which intersects the guiding black line
- 🕒 the track contains an intersection with the possibility of passing straight/straight or left/left
- 🕒 the track also contains a broken guiding line
- 🕒 the track will have waypoints 1 – 6 marked to determine the distance travelled – marking the waypoints does not disturb the guiding line – the waypoints will be marked on the edge of the sheet



Robotic vehicle specification

- 🕒 maximum size of the robotic vehicle including the cup (length x width x height): 200 x 200 x 200 mm
- 🕒 number of axles: unlimited
- 🕒 chassis: unlimited
- 🕒 engine power: unlimited
- 🕒 vehicle drive: electric motors
- 🕒 wheels, tracks and other technical mechanisms of the vehicle must not damage the track or the surface of the track
- 🕒 the vehicle must form a single unit

Vehicle control unit

- ❑ any platform (Arduino, Raspberry, LEGO, micro:bit, Odroid, ...)
- ❑ vehicle must be completely autonomous, it must not use the option of external control (wi-fi, Bluetooth etc.)

Water cup and its placing a cup on vehicle

- ❑ cup mounting on the vehicle: the cup will be placed in a ring-shaped mounting, with the inner diameter of the mounting being slightly larger than the outer diameter of the bottom of the cup – the cup must stand completely freely in the mounting, it must not be clamped by the mounting, the inner height of the lining must not be higher than 1 mm. A free zone of at least 25 mm must be maintained around the entire cup – it will be tested with a measuring device.
- ❑ the mounting has a groove for attachment to the vehicle using M3 screws; the groove allows clearance for attaching the cup mounting to the vehicle
- ❑ the cup mounting can be part of the vehicle
- ❑ it is not allowed to change the size or otherwise modify the cup mounting
- ❑ the colour or material from which the cup is printed is not decisive (ABS, ASA, PET, ...)
- ❑ failure to comply with the specifications of the robotic vehicle and the cup mounting including the free zone of 25 mm will be penalized in the best ride category by 90 seconds during each competition ride



Competition rules

Best design category

The competition team will prepare technical documentation for the robotic vehicle, which will be submitted during the evaluation of the best design category.

The following criteria are evaluated in the best design category:

- ❑ Technical documentation and its execution 0 – 5 points
- ❑ Use of software tools 0 – 5 points
- ❑ Construction skills 0 – 5 points
- ❑ Aesthetic impression 0 – 10 points
- ❑ Innovation 0 – 5 points

The maximum number of points is 30.

The team with the highest number of points wins the category.

Best presentation category

The competition team will prepare an electronic presentation in .pptx or .pdf format, with a maximum size of 100 MB. If these conditions are not met, the presentation will not be launched. The competitors will present via a computer connected to a data projector. The presentation time is 10 minutes (7 minutes of presentation + 3 minutes of questions from the evaluation committee). Before the presentation begins, the competition team will submit the vehicle and the vehicle's technical documentation to the evaluation committee.

The following criteria are evaluated in the best presentation category:

- 🕒 Presentation structure 0 – 10 points
- 🕒 Language and answering questions 0 – 6 points
- 🕒 Effective non-verbal communication 0 – 8 points
- 🕒 Use of presentation tools 0 – 6 points

Maximum number of points is 30.

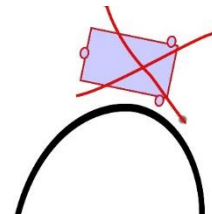
The team with the highest number of points wins the category.

Best ride category

Before the start of each team's competition run, a measured amount of water – 70 ml – will be poured into the cup. In the event that the water cup is knocked over, the vehicle must be placed back at the start and the cup must be refilled with the prescribed amount of water.

The vehicle must meet the prescribed specifications and cup layout. Failure to comply with the specifications of the robotic vehicle and cup layout, including the 25 mm free zone, will result in a penalty of 90 seconds in each competition run.

The competitor places the vehicle on the guide line in front of the black line intersecting the track (START/FINISH), manually lowers it so that the vehicle itself passes the black line intersecting the track (START/FINISH). After safely passing the track, including meeting other conditions, the vehicle must automatically stop on or behind the black line (START/FINISH) intersecting the track. If the vehicle does not automatically stop behind the black line (START/FINISH) intersecting the track, a penalty of 5 seconds will be added to the resulting time of this run.



In the event of the vehicle completely leaving the black guiding line (the entire chassis of the vehicle leaves the black guiding line), or if the track is shortened, the vehicle must be placed at the start again.

Time measurement will be carried out electronically.

Qualification

All competition teams will have 5 minutes on the test track and 5 minutes on the competition track. The competition team can use the full 5 minutes on the track. The number of runs is not limited. The robotic vehicle carrying a cup with a measured amount of water must drive along the defined track without spilling water in the cup. The fastest time to drive along the track will be included in the results list.

The 24 teams with the fastest time from the qualification will advance in the competition. If fewer than 24 teams reach the finish line, the required number of teams will be added according to the number of passing points achieved 1 - 6 in one run. In the event of a tie, the total number of passing points will decide.

Preliminary round

The first 8 fastest teams from the qualification automatically advance to the round of 16 and will be placed in the final heats table (spider).

Teams 9 to 24 will fight in the preliminary round for advancement to the round of 16 - the pairs will always be divided best with worst, i.e. - 9th x 24th, 10th x 23rd, 11th x 22nd.

In the preliminary round, the time limit for one race is 5 minutes. The pair race continues until one of the competing teams reaches the finish line (there may be more attempts - in case of going off the track, the vehicle must be placed back at the start, this also applies in case of tipping over a cup of water - the cup must be filled with the prescribed amount of water again).

There must always be a clear winner from the heats. The vehicle that reaches the finish line first advances to the next round. If no vehicle reaches the finish line within the set 5-minute limit, the competition team that passes more checkpoints 1-6 in one run advances.

Final rides

The first 8 fastest teams from the qualification round and the winning teams from the preliminary round compete in the round of 16, which will be placed in the final heats table (spider) according to the times from the qualification round (1st x worst advancer, 2nd x second worst advancer...)

The quarter-finals, semi-finals, finals and the heat for 3rd place will have the same rules as in the preliminary round and will compete according to the given schedule (spider) - the vehicle that reaches the finish line first advances in the competition.

In the overall results list, teams from 5th place will be ranked according to the resulting times from the qualification round.

Final rides table



Evaluation

The evaluation committee will be composed of representatives of the University of West Bohemia in Pilsen and, if applicable, other representatives of universities in the participating countries.

The evaluation committee will evaluate the following categories:

- 🕒 best ride
- 🕒 best design
- 🕒 best presentation
- 🕒 overall ranking

The evaluation of individual competition categories will be carried out in accordance with the rules and evaluation criteria of the competition.

Competition organizers

- 🕒 Pilsen Region
- 🕒 University of West Bohemia in Pilsen
- 🕒 Secondary Vocational School of Electrical Engineering, Pilsen, Vejprnicka 56
- 🕒 Techmania Science Center, o. p. s.

Contacts

Organizational matters for the competition:

Alena Altmanová, Officer in the Department of Education Organization, Regional Authority of the Pilsen Region, alena.altmanova@plzensky-kraj.cz

Contact to the University of West Bohemia in Pilsen

Assoc. Prof. Ing. Luděk Hynčík, Ph.D., Director for International Cooperation, New Technologies – Research Centre, University of West Bohemia in Pilsen, hyncik@ntc.zcu.cz

Chairman of the evaluation committee:

Assoc. Prof. Ing. Miloš Železný, Ph.D., dean of the Faculty of Applied Sciences, University of West Bohemia in Pilsen, zelezny@kky.zcu.cz

Contact to The Secondary Vocational School of Electrical Engineering, Pilsen, Vejprnicka 56:

Václav Leba, vice director for practical teaching, Secondary Vocational School of Electrical Engineering, Pilsen, Vejprnicka 56, lebavaclav@souepl.cz