

WORLDSKILLS SINGAPORE 2012

TECHNICAL DESCRIPTION

MOBILE ROBOTICS *(Information for Contestants)*

Name and Description of Skills Category

- 1 The name of the skills category is MOBILE ROBOTICS.
- 2 Mobile Robotics is a team event comprising 2 members per team.
- 3 The competition involves assembling, setting-up, programming, managing and maintaining mechanical systems within a mobile robot as well as installing, operating, and troubleshooting mobile robot control systems.

Scope of Work

- 4 Competitors will be assigned to implement a mobile robot to perform various tasks over the 3-day competition.
- 5 The Competition Tasks will be modular. The time allocated to complete all the Competition Tasks is between 18 and 22 hours spread over 3 days.
- 6 The competitors must be able to perform the following tasks on Robotino®:
 - 6.1 Assemble/disassemble
 - 6.2 Troubleshoot
 - 6.3 Navigate using range and proximity sensors
 - 6.4 Design/Fabricate and integrate add-on component(s) [eg. gripper, kicker]
 - 6.5 Develop an application program using vision and other sensors
 - 6.6 Compete with other robots in the same arena

Practical Work

- 7 Competitors observed, by the jury panel, to be exercising unsafe workplace practices will be directed to stop working and are required to demonstrate to the jury panel that they have corrected the safety concern before they are allowed to resume working.
- 8 Competitors must use the necessary and appropriate working techniques to design, integrate, assemble, and maintain their Robotino® with all design work to be carried out within the assigned team workspace.
- 9 Competitors must generate all programs required by their mobile robots for the tasks.

Theoretical Knowledge

- 10 The required theoretical knowledge covers:
 - 10.1 sensing system;
 - 10.2 vision system;
 - 10.3 omnidirectional drive system;
 - 10.4 mechanical structure development;
 - 10.5 embedded controller;
 - 10.6 wireless communication setup between laptop and Robotino®;
 - 10.7 setup and operation of Robotino®
 - 10.8 typical icon-based [ie. Robotino® View] programming interface on Windows operating system; and
 - 10.9 design, assembly and integration of mechanical [e.g., handling units] and electrical components [e.g., sensors] typical to a mobile robotic system.

Major Equipment, Tools and Materials

- 11 The equipment and tools to be used in the competition are:

Equipment

Each team is required to bring its own competition mobile robot, Robotino®, and all the necessary parts [e.g., add-on components such as gripper, etc] for the competition.

A standard PC with Windows operating system and standard Robotino® software will be provided. Competitors are not allowed to bring in any other software.

Tools for competitors

Each team must supply its own tools. Any commercially available tools may be used. This is subject to the prior approval by the jury panel.

- 12 Diagrams and specifications of Robotino® are given at Annex A.

Marking Criteria

- 13 Each competition challenge task description package will include details defining the particular rules of the competition arena game and scoring method that will be applied in that task.
- 14 Final overall standing will be based on the total points scored by a team over the competition days.
- 15 “Time taken to complete the task” will be one of the components used to evaluate performance.

* * * * *

END

Oct 2011
Institute of Technical Education
Singapore

(The Organiser reserves the right to update the technical description before the WSS2012 if deemed necessary).