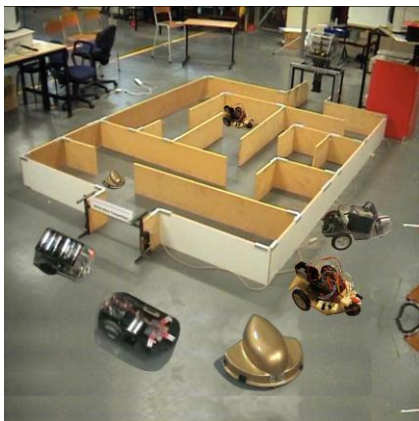


## Mechanical Engineering in Mount Druiitt College

In this modernized world, people in the workforce need to be multi-skilled. The Mechanical Engineering section of Mount Druiitt College offers courses in mechanical and manufacturing engineering in Certificate III, Diploma and Advanced Diploma levels. Mechatronics, which is the amalgamation of mechanical and electronics systems, is the specialty of our section. Our students learn mechanical engineering through studying modules in design and automation. They model their mechanical design by computer 3-D modelling and stress-analyse them by using computer finite element analysis software. In automation, our students learn to use electronics, sensors, personal computer, microprocessors and programmable logic controllers to perform engineering tasks.

## The Robot Maze Challenge

To arouse students' interests in studying of mechanical design, electronics, computer programming and control, instead of delivering the course in the conventional piece-meal way, our first-year course is designed around a project task of building an autonomous robot car. Each first year student has to design and build a robot car which should be able to negotiate a maze and find its way out by using sensors and on-board intelligence. The mechanical design is done through CAD 3-D modelling. At the end of the year, a robot maze contest is held to assess the achievements of students in their study through the project work. The robot car which goes through the maze at the shortest time will be the winner of the contest. This event is sponsored by the NSW chapter of the Institution of Engineering And Technology. Official of the IET will attend the event and present the trophies to the winners.



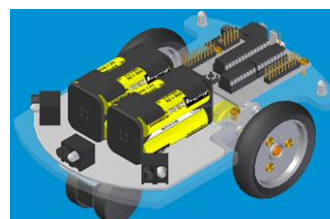
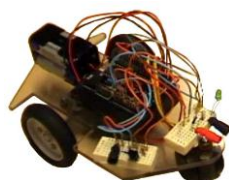
## Contest details

Date : 18 November, 2013 (Monday)

Time : 6:30 p.m. start – till 8:30 p.m.  
A pre-race BBQ will start at 5 pm.

Venue : Room EG-07, Mechanical Workshop at building E, Mount Druiitt College, cnr Mount Street & North Parade Mount Druiitt 2770

All are welcome



The IET Robot Challenge – 2013  
Mechanical Engineering Section - Western Sydney Institute - Mount Druitt College  
Sponsored by the Institution of Engineering and Technology

### **Rules of contest**

- The robot contest will start at 6:30 pm.
- Each robot car will be steered by its on-board intelligence. Remote control is not acceptable.
- There will be 3 stages for the contest:
  - Stage 1: In this qualifying stage a robot will need to successfully negotiate the maze by following the left wall. Each robot is allowed 2 trials to pass this stage. The time of these runs will not be counted for the contest. The maximum time allowed for a trial is 90 seconds (not counting penalties). If a robot cannot go through the maze in 90 seconds the run is deemed to be unsuccessful. A robot that cannot pass the maze in 2 runs will be regarded as not meeting the minimum standard for the race and the robot will not take part in subsequent stages of the contest.
  - Stage 2: Each qualified robot will do 2 runs, one following the left wall and the other following the right wall. The total time of the two runs will be the result for each robot for stage 2. The 5 robots with the least total time will enter into the stage-3 contest.
  - Stage 3: The contestant with the least total time will have the privilege choosing to set up the left route or the right route for the stage-3 contest. The contestant of the second least total time will have the privilege to set up the remaining route. Each of the 5 contesting robots will do a left-wall run and a right-wall run. The one with the least total time will be the winner of the race.
- If a robot is stuck in the maze, rescue by manual handling is permitted. However rescuing will attract penalty in the form of added time to the total time of run. In each run a robot is allowed a maximum of 3 rescues. Only either of the following two ways of handling is allowed:
  - Turning the robot on the spot by hand without changing location will attract a penalty of 10 seconds
  - Causing a robot to turn by providing a reflecting surface and without touching the robot will attract a penalty of 5 seconds.
- While gliding against the wall is permitted, collision on the wall (when banging sound is heard) will attract penalty. For each collision, a penalty time of 5 seconds will be added to the total time.

### **Contests**

The Institution of Engineering and Technology, NSW chapter is the sponsor the trophies for the winners of the following two contests. Mount Druitt TAFE College will sponsor the pre-race BBQ and funds the prizes for winners.

1. Race through the maze
  - Winner : - Prize : The IET trophy plus gift voucher of \$100
  - First Runner-up - Prize : Trophy for runner-up plus gift voucher of \$70
  - Second Runner-up - Prize : Gift voucher of \$30
2. People's choice of best overall achievement
  - To be determined by voting from contestants and teachers. Each contestant or teacher will have one ballot paper. Each person will pick the top three best overall achiever in respect to design, application of technology, programming and target achievement. The best, second and third achievers will have scores of 5, 3 and 1 respectively.
  - Winner : Prize : Trophy for Best Overall Design plus gift voucher of \$100
  - First Runner-up Prize: Trophy for runner-up plus gift voucher of \$70
  - Second Runner-up Prize: Gift voucher of \$30

Perpetual trophies, "The IET Trophy" and the "Trophy for Best Overall Design" will be kept at the Mechanical Engineering section.

### **BBQ**

The students' Services Section of the college has kindly agreed to sponsor a pre-race light BBQ for students and families/employers on the night. The BBQ will start at 5:30 pm. Families and employers of participants are invited to join the BBQ and observe the race.