Comp 2403   Design–Build–Test   Mini-Project Brief   (ILO4)
CBP All-Saints Day

You are invited to design-build-test a differential drive robot with a goal, which you can decide. You can choose to use the following robot chassis

1. The Parallax Activity Bot
2. Henry Stepper Bot
3. A chassis of your own design using CAD and laser-cut to your specifications. This should use stepper motors.

You are free to choose any available sensors (see below).

You must work in a team, where the minimum team size this year is 2.

You must agree your goal at the start of the project (within your team), but this may change as your project develops. This is fine, but you should note down any changes in your portfolio.

You do not need to communicate your goal to the module tutor – give him a pleasant surprise.

Deliverables:

1. A section in your 'portfolio' (which hits ILO4). This could include the following suggested items, but I encourage you to be creative.

   a. Short statement of your initial goals, and short notes if these changed.
   b. Your initial design. This could be pencil sketches, CAD drawings, notes of conversations within your team[1].
   c. The 'build process'. This would normally include photos of your hardware as you moved from design to build, or of your software as you moved from notes, flow-diagram, or pseudo-code to working code.
   d. Evidence of your testing. This could be a movie-clip, a series of photos, or a table showing your testing strategy and results.

2. A robot solution that works, or partially works. This could be a movie-clip (see 1(d)) or you could choose to bring your robot to the *viva-voce* examination.

Available Stuff.

- You will have access to hand tools, such as a saw, a drill, and glue-guns.
- A limited range of materials will be available, e.g., 3mm MDF or ply, and 3mm screws and nuts, colored electrical tape, Velcro fasteners, cheese and crackers.
- The 3D printer is also available if you need to print some small objects. To use this, you will either need to download your own Google Sketchup app or use Blender.
- You will be able to have 3mm MDF components laser-cut if required. To do this, you are advised to use QCad (installed on the lab machines) and limit your design to A4 sheets (you may use up to two).

The following materials are available. Please note, some are limited in quantity, so it will be a standard queue, "first come first served".

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[1] Conversations show learning and are therefore important. You could present conversations of (i) how you came to your initial design, (ii) how you solved problems during the DBT process (including hardware and software). You could voice-record a conversation you have had.

Item	Quantity
Sensors	
Pixy Cameras	12
Line follower sensors	6
Laser Range-finder	1
Ultrasonic Sensors	12
Accelerometer/Compass Sensors	6
Shaft rotation sensor	6
Hall-effect magnetic sensor	6
Robot Eye	1
Flame Sensor	1
Sound Sensor	1
Magnetic Field Sensor	1
Temperature Sensor	1
Laser Rangefinder	1
Robots	
Parallax Activity Bot	6
CBP-FBO 'Henry'	6
Materials to create own chassis	6
Mechanical	
3mm MDF strips	lots
3mm Screws and Nuts	lots
10mm Ceramic Magnets	100
Electronic Components	
Red LED	12
Green LED	12
Yellow LED	12
2N2222 Transistor	20
330R Resistor	36
10k Resistor	36
Press button switch	6
Light Dependent Resistor	12
Micro-Switches	12
Mini loudspeaker	6
LCD Display	6