**Demonstrate Development and Learning to Solve a Problem with a Novel Robotic Solution (5%)**

**Includes Details of 41013 Robotics Learning Outcomes such as Robot Modelling, Planning and Safety, and User Interaction with the System (10%)**

* Inverse Kinematics (ikcon) to generate joint angles
* Trapezoidal trajectory generation due to it being less computationally demanding than quintic polynomial trajectory planning and remains at top joint velocity for longer
* Estop, Light Curtain, Cones, Gavin Supervising
* Users can enter targets and deposit locations

**Robotics Sensing: Ideas for applicable sensors that would (1) give the robot more capability; and (2) improve the system’s safety (3%)**

* Force sensing on end effector to ensure target is gripped
* Reed switch to ensure gripper pneumatic cylinder is functional
* Proximity sensor to detect humans close to moving robot
* Pressure plate to prevent robot operation when people are in the vicinity

**Evidence-based future predictions for robotics in the given scenario (2%)**

* Very similar desktop robot arm
  + $800 – robot arms getting cheaper and more accessable
  + <https://www.rotrics.com/?utm_source=hexbot&utm_medium=home&utm_campaign=Redirect>