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| UTS SAFE WORK METHOD statement (SWMS) |

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| 1. **FACULTY/SUBJECT** | |
| Faculty/Subject title | 41013 Industrial Robotics |
| Subject supervisor/coordinator | Gavin Paul |
| SWMS prepared by | Connor Rudd & Claire Matthews |

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| 1. **WORK ACTIVITY DESCRIPTION** | | | | | | |
| Describe the work activity E.g. Operating, Handling, Using.. Include names of hazardous equipment, substances or materials used,  and any quantities and concentrations of substance(s) or reaction products. | The task is to model multiple robotic systems in a kitchen environment. The robots will be handling raw materials involved in cooking activities for baking a cake, with weight <1kg added to end effector of robotic arm/gripper. The system will be operating pick and place tasks  Hazardous equipment: Dobot, Custom 6DOF Robotic Arm, Control System, Oven  Hazardous substances or materials: Robot arm lubricants/grease (typically only a few mL), cleaning agents (typically small quantities determined dependent on use). While raw materials used for cooking are not reactive or hazardous, they can impair the robot’s ability to function if workspace isn’t kept clean.    Similar System baking cookies. | | | | | |
| 1. HAZARDS: Choose those hazard types that will need to have control measures in Section 4 | | | | | | |
| **Work Environment**   * Working in Remote Locations * Working Outdoors/fieldwork * Clinical/Industrial setting * Poor ventilation/Air quality * Temperature extremes * Working at Height * Slip/Trip/Fall hazards | | **Plant**   * Noise * Vibration * Working with compressed air * Lifts Hoists or Cranes * Moving parts (Crushing, friction, cut, stab, shear hazards) * Pressure Vessels or Boilers | | **Chemical**   * Hazardous Chemicals use * Skin/eye irritant * Sensitiser * Mutagen * Carcinogen * Toxic to reproduction * Aquatic toxicity * Toxic * Corrosive * Dangerous when wet | | **Ergonomic/Manual Handling**   * Repetitive or awkward movements * Lifting heavy objects * Over reaching * Working above shoulder or below knee height * Poor workstation set up |
| **Electrical**   * Plug in equipment * High voltage * Exposed wiring * Exposed conductors | | **Radiation**   * Ionising Radiation * Non-ionising radiation (Lasers, Microwaves, Ultraviolet light) | | **Biological**   * Sharps/Needles * Cytotoxins * Pathogens/infectious materials * Infectious materials * Communicable diseases * Animal/insects * Work with fungi/bact/viruses | | **Psychosocial**   * Aggressive or violent clients/students * Working in isolation * Working with timeframes * Staffing issues |
| 1. **CONTROLS MEASURES: Choose those that apply for hazards identified** | | | | | | |
| **Eliminate/Isolate/Substitute / Engineering Controls**   * Remove hazard * Restrict access * Redesign equipment * Guarding / Barriers / Fume Cupboard / exhaust * Biosafety cabinet * Use safer materials/substances * Ventilation * Regular maintenance of equipment * Redesign of workspace / workflow | | | **Admin specific: Licenses/permits Work Methods**   * Training Information or Instruction * Licensing or certification of operators * Test and tag electrical equipment * Restricted access * Regular breaks * Task rotation * Work in pairs * Document Chemical risk assessment * Ladder / Sling register | | **Emergency Response Systems**   * First aid kit * Chemical spill kit * Safety shower * Eye wash station * Emergency Stop button * Remote Communication Mechanism | |
| **Other controls not listed** | | | | | | |
| 1. **PPE REQUIRED (Tick those that apply)** | | | | | | |
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| 1. **EMERGENCY EQUIPMENT** | | | | | | |
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| 1. **work activity steps** |
| **before you start:**   * Safety Induction course * Inspect wires and cabling * Know load specs * Shutdown robot * Open oven door * Clean work area, return everything to start pose and replenish ingredients * Reposition robot to starting pose * Electrically isolate * Clean robot * Exit fenced area * Power on robot * Announce start of robot movements (warn people around)   **steps in work activity:**   1. Check all cameras and sensors are clear and receiving data 2. Stand next to e-stop button 3. Stand next to laptop/control system 4. Supervise entire movement and remain outside workspace area 5. Let people around know when activating 6. Entire workspace is secured (gate closed) 7. Power off robot 8. Enter workspace 9. Inspect results   **emergency procedures:**   * Press emergency button * Activate fire alarm * Remove all people in proximity * Call emergency services   **training required:**   * Custom robot induction including supervised training * Supervisor of use |

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| 1. **sign off** | | |
| **prepared by:**  **NAME: Connor Rudd &**  **CLAIRE MATTHEWS** | **Lab Supervisor**  **Name: Michael Lee** | **Date: 28/08/24**  **Review Date: 28/08/2024** |