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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 | Jet Thomas Webb (#24502825) & Tamsyn Crangle (#24439287) |

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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. | Picking, cutting, and juicing a lemon using a KINOVALink6 and a *Cyton 300e.* With usage of a plastic knife and mounted lemon juicer. One fake, 2 part 3D printed lemon will be ‘cut’ and ‘juiced’. The lemon will be held together with 2 magnets and the knife will separate the magnets. | | | | | |
| 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:**   * Check the surrounding working area to ensure that there are no foreign objects within either robot arms range of motion. * Ensure the other nearby people have acknowledged that you are going to be operating a robot and are not within the robot's range of motion. * Ensure the robot cabling is tidy and not a trip hazard or at risk of being unplugged accidentally. * Run simulations within MATLAB to ensure no dangerous toolpaths are generated. * Ensure robots are in good condition, check electrical tags and robot exterior.   **steps in work activity:**   1. Remove sheath from plastic knife 2. Connect laptop to robots 3. Upload code from within MATLAB to both robots 4. Run robot operations    1. Pick up lemon    2. Separate 3D printed lemon halves    3. ‘Juice’ lemon    4. Drop remaining lemon in bin    5. Return to start position 5. Disable robot 6. Sheath plastic knife   **emergency procedures:**   * Press emergency button * Notify security or dial 6 using the UTS internal phone   **training required:**   * UTS Mechatronics Lab induction. * Robot operation guides. |

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| 1. **sign off** | | |
| **prepared by:**  **NAME: Jet Webb & tamsyn crangle** | **Lab Supervisor**  **Name: Michael Lee** | **Date: 20/10/2023**  **Review Date:** |