GENERAL RISK ASSESSMENT TEMPLATE

Work area / operation	CB11.10.403	**Assessor's name**	Anisha Uddin
Other persons consulted	Nicola De Meio	**Date of safety assessment**	01/10/2025
Subject Coordinator's Name	Gavin Paul	Lab Supervisor's Name	Felipe Ulloa Gutierrez

ACTIVITY - Describe hazardous activities related to the work area or operation.	**ASSOCIATED HAZARDS**	**INHERENT RISK** - Harm that could occur from these hazards if controls fail or are not in place.	**EXISTING CONTROL MEASURES**	**PROPOSED CONTROL MEASURES** - Proposed action to minimise risk to an acceptable level.	**TARGET DATE** - To implement proposed controls	**RESIDUAL RISK LEVEL** (H,M,L)
Electrical cables mishandled	Damaged insulation; exposed conductors; liquids near power; cable clutter/trip; overloaded boards.	Electric shock/burns; trips/falls; equipment damage; fire.	Induction; tagged & tested gear; RCD outlets; visual pre-checks; keep liquids away; cable covers.	Remove/tag-out damaged leads; route via floor covers; keep boards off floor; pre-use checklist + signage; enclosed footwear.	20/10/2025	L
Leaving the robot arm unattended	Uncommanded start: bystanders enter swept volume; unexpected motion.	Impact/crush/entanglement; equipment damage.	E-stops; collaborative speed/force limits; line of sight.	Never run unattended; pause/E-stop before leaving; disable drives; "Robot Disabled – Do Not Start" sign; buddy during testing.	20/10/2025	L
Using inappropriate load on the robot	Exceed payload/CoM; unsecured tooling; detachment/fall.	Dropped load/collision; hand/foot injury; equipment damage.	Manufacturer payload guidance; standard end-effectors; tutor check first setup.	Keep payload within limits (UR3 nominal 3 kg); validate mass/CoM; correct fasteners/torque; mechanical stops; record payload calc + pre-run check.	20/10/2025	L
Robot arm moves incorrectly	Unexpected/rapid motion; self/fixture collision; pinch points.	Impact/laceration; damage; flying fragments.	E-stops; teach mode reduced speed; clear bench; software limits.	Reduce speed/accel and envelope; add collision objects in sim; verify home; dry-run + single-step first execution; hands out of reach zone; tape safety perimeter.	20/10/2025	L
Incorrect manual handling	Heavy/awkward loads; back strain; pinched fingers; drops.	Musculoskeletal injury; foot injuries; equipment damage.	Musculoskeletal injury; foot injuries; equipment damage.	Use trolley/lifting aids; split loads; team-lift SOP with neutral spine; gloves for sharp fixtures; enclosed footwear.	20/10/2025	L
Operating robot when tired or distracted	Reduced attention/judgement; coding/setup errors; missed hazards.	Higher likelihood of incident leading to injury/damage.	Code review encouraged; drop-in support; induction covers fitness for work.	Limit continuous run time; breaks every 60–90 min; no solo high-risk after hours; "stop if unsure" rule; buddy check before first run.	20/10/2025	L

Approval of	I am satisfied that the residual risk with existing controls is acceptable OR	X Yes ☐ No	Signature	**Anisha Uddin, Nicola De Meio**	Date	01/10/2025

assessment	I am satisfied that that the proposed controls will reduce risk to an acceptable level. ☐Yes ☐No				

Guidance notes for documenting General Risk Assessments

ACTIVITY

Briefly describe this hazardous 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.

ASSOCIATED HAZARDS

Plant & Equipment – noise, vibration, moving parts (crushing, friction, stab, cut, shear), pressure vessels, lifts/hoists/cranes, sharps
Manual Handling – repetitive movements, lifting awkwardly, lifting heavy objects
Work Environment – moving objects, extremes in temperature, isolation, work at height, allergies to animal bedding, dander and fluids, risk of fire/explosion, slippery surfaces/trip hazards
People – potentially violent or volatile clients/interviewees
Communicable Diseases – exposure to bodily fluids/infectious materials, animal bites and scratches,
Environmental – emissions to atmosphere, discharge to soil and water bodies (including stormwater run-off), nuisance noise & odour, poor ventilation/air quality
Radiation (non-ionizing) – including lasers, microwaves or UV light
Electrical – plug-in equipment used in 'hostile' work environment, exposed conductors, high voltage equipment
Pathogens – dealings with pathogenic microorganisms such as bacteria, parasites, fungi or viruses
GMOs – dealings with genetically modified organisms
Cytotoxins – carcinogens, mutagens or teratogens
Radiation (ionizing) – Ionizing radiation source such as radioactive substance or radionuclide, or irradiating apparatus
Chemical – hazardous substances, dangerous goods, fumes, dust, compressed gas, hazardous waste

INHERENT RISK

Provide details of the harm that could be caused to people or the environment if something goes wrong.
For example: inhalation of fumes, laceration, injury to back, infection, burns to skin or eyes.
Think about what could happen if controls fail or are not in place.

CONTROL MEASURES

Note the existing and proposed actions to reduce risk to an acceptable level. Apply the "Hierarchy of Controls", listed below, when deciding the best control measure to apply. Control types closer the top of the list are preferable.

1. ELIMINATE THE HAZARD. For example: use a different less dangerous piece of equipment, fix faulty machinery, use safer materials or chemicals
2. ISOLATE THE HAZARD FROM THE PEOPLE. Separate people from the danger. For example: use shielding, use lifting equipment or trolleys, remove dust or fumes with exhaust system, lock-out machinery.
3. CHANGE THE WAY THE JOB IS DONE. For example: change work practices, provide training, information and signs, develop work procedures.
4. USE PERSONAL PROTECTIVE EQUIPMENT (PPE), noting specific PPE is required for each job. For example: respirator, hearing protection, gloves. Training and information is required for the use of PPE.

RESIDUAL RISK LEVEL (H, M, L)

Estimate risk taking into account the way the activity is run and control measures put in place. The level of risk can be determined by combining consequence and likelihood using the risk matrix from below. Residual risk should be reduced to a level acceptable by management.

CONSEQUENCE OF HARM - This is how bad it will be if something does go wrong e.g. the number of people that could be harmed, the severity of injury.

LIKELIHOOD OF HARM - Chance of harm occurring is affected by the duration of the activity and its frequency; the number of people doing the activity and the level of exposure to the hazard.

		CONSEQUENCE				
		Insignificant	Minor	Moderate	Major	Catastrophic
	Injury/illness consequence	Non-injury incident	Injury/ill health requiring first aid	Injury/ill health medical attention	Injury/ill health requiring hospital admission	Fatality or permanent disabling injury
	Environmental consequence	Minor effects on biological or physical environment	Moderate short term effects but not effecting ecosystem functions	Serious medium-term environmental effects	Very serious long term impairment of ecosystem functions	
LIKELIHOOD: Almost Certain	The event will occur on an annual basis	Moderate	High	High	Critical	Critical
Likely	The event has occurred several times or more in your career	Moderate	Moderate	High	High	Critical
Possible	The event might occur once in your career	Low	Moderate	Moderate	High	High
Unlikely	The event does occur somewhere from time to time	Low	Low	Moderate	Moderate	High
Rare	Heard of something like this occurring somewhere	Low	Low	Low	Moderate	Moderate

UTS SAFE WORK METHOD STATEMENT (SWMS)

1. FACULTY/SUBJECT

Faculty/Subject title	41013 Industrial Robotics
Subject supervisor/coordinator	Gavin Paul
SWMS prepared by	Anisha Uddin, Nicola De Meio

2. 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.	Operating and programming robotic arms (Dobot Magician and UR3) in the UTS Mechatronics Lab for the RoboFlorist project. This includes powering on the robot, connecting controllers, attaching artificial flowers and ribbons, performing programmed pick-and-place movements to arrange bouquets, and shutting down the system. Hazards include moving robotic parts, entanglement with floral stems/ribbons, electrical cables, heavy or awkward payload attachments, and software/hardware errors.

3. 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

4. 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
- Insulated gloves and non-conductive mats when handling electrical cables
- Steel-toe safety boots when handling heavy robot parts
- Face shields and safety glasses for working near robot arms
- Audible alamrs/flashing lights to indicate when the robot is active

5. PPE REQUIRED (Tick those that apply) ✓

6. EMERGENCY EQUIPMENT

7. WORK ACTIVITY STEPS

BEFORE YOU START:

- Complete UTS Rapid Global induction and sigh into lab
- Inspect cables and equipment for damage
- Ensure load limits are known and appropriate for task
- Put on required PPE (gloves, boots, glasses)

STEPS IN WORK ACTIVITY:

1. Power on robot and controller following supervisor instructions
2. Test robot in low-speed/ simuation mode
3. Attach or adjust loads using trolleys/assistance if required
4. Operate robot within marked safe zones, maintaining safe distance
5. Shut down robot and disconnect power safely after use

EMERGENCY PROCEDURES:

- Press emergency button
- Notify security or dial 6 using the UTS internal phone
- Provide first aid where required

TRAINING REQUIRED:

- UTS Lab Induction (FEIT CB11 MMR Mechatronics Lab)
- Training in safe robot operation (delivered by lab staff)
- Manual handling training

8. SIGN OFF

PREPARED BY: **LAB SUPERVISOR** **DATE:** 01/10/2025

NAME: ANISHA UDDIN, NICOLA DE MEIO **NAME:** FELIPE ULLOA GUTIERREZ **REVIEW DATE:**