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|  | Teaching Laboratories Risk Assessment |

| **Date:**22/09/2021 | **Assessed by:**Martin Coram | **Approved by:****Craig Hopper** | **Building / Location:**Engineering Building B2nd floor teaching laboratories2B.0192B.004-13 | **Assessment ref no:**FSE\_EngB\_Teaching Laboratories Risk Assessment | **Expiry date:**22/09/2022 |
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| **Task/Premises:** This risk assessment is to cover general risks for the dry teaching laboratories in Engineering Building B. Any specific tasks undertaken in this laboratory MUST be covered by a task specific teaching risk assessment.**Key:** E=essential for all high-risk areas , B=bespoke dependent on type and risk factors of work done in the area , W=work related and/or statutory requirements |
| **Please add as appropriate once known:**

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|  **LABORATORY HAZARDS** |
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| **CONTROL MEASURES** |
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| **Activity** | **Hazard** | **Who might be harmed and how**  | **Existing measures to control risk** | **Risk rating** | **Result** |
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| Fire prevention and protection**E=essential** | FireSmoke | Staff and students, visitors.If present within the building during fire DeathBurns Smoke inhalation | * Induction arrangements cover security and fire awareness and include how to locate and use a fire door to exit the building and the location of the fire assembly point(s).
* All new staff complete fire awareness e-training.
* Fire alarm system are in place and tested weekly on day at time to enable users to identify the sound of the alarm
	+ 09:30 – Oddfellows Hall
	+ 09:45 – Engineering Building A
	+ 10:00 – Engineering Building B
	+ 10:15 – York Street Building
	+ 10:30 – North Basement
	+ 10:45 – South Basement
	+ 11:00 – Active Travel Hub
* Fire evacuation practices are carried out annually
* Induction covers the importance of maintaining clear fire exit routes and keeping the doors closed unless essential. Induction also covers the need for high general housekeeping standards.
* Monthly self-inspections must highlight any fire risks.
* Ready access to fire extinguishers is available for use by trained users.
* Staff ‘hosts’ responsible for safety and, if required, evacuation of visitors.
* Evacuation marshals attend suitable training and assist where possible during evacuations during normal working hours.
* Requests to work out of hours include emergency action in case of fire and use of fire routes and doors.
* The section on chemical storage must also be considered in a DSEAR assessment.
 | Low | A |
| Action in the event of an emergency**E=essential** | Not being aware of the evacuation procedure in the event of an emergency.Injuries/chemical contaminationLack of assistance out of hours | Staff, students and visitors.Lack of awareness/unacceptable behaviours when the fire alarm sounds may result in assuming that real alarms are practice drill and subsequently delay evacuation leading to being trapped by fire or other life threatening incident.Individuals may not find the first aid kit, emergency showers, fire exits  | * Users are instructed and empowered to act if they suspect an emergency situation to activate the fire alarm to trigger evacuation of the building.
* All incidents are reported as required to the person responsible for the area and to a School Safety Advisor
* First aid notices are situated in prominent places around the building to be consulted when first aid is required for appropriate response
	+ For life-threatening emergencies: Call emergency services on 999, then inform Campus Security.
	+ For serious injuries and illnesses (and out of hours first aid): Call Campus Security on 0161 306 9966.
	+ For minor injuries and illnesses 9am-5pm: Locate first aider using QR code located on the First aid notice
* First aid provisions within the area are checked as part of monthly self-inspections in high risk areas.
* Actions to take in the event of chemical spills/gas leaks are known to those concerned see relevant sections below and may require use of an Emergency Response Team
* How to contact Security using the telephone number on the back of staff/student ID cards is emphasised at Induction. Security contact details are 0161-306-9966, or 69966 from an internal phone. All Security staff are first aid trained
 | Low | A |
| Accessing high risk areas**E=essential**  | Individuals enter the area unaware of multiple risksIndividuals enter the area and cause harm to other individuals or equipmentIndividuals do not know how to interpret and/or ignore high risk area safety signage | Staff, students, visitors and/or intruders.May not be aware of hazards and controls due to inadequate or lack of signageLack of knowledge /training to understand signage to enable entrants to know what hazards and controls are present in an areaEntrants ignore safety signage e.g. not wearing safety spectacles in designated areasSafety signage is inaccurateIndividuals may get/be allowed in without access permissions due to doors being ajar and people not challenging their presence or noticing them.  | * Access to high-risk areas is restricted by Borg locks/key locks or electronic access control. The codes/keys/card updates are only permitted for those who have received full area induction and approved by the area responsible person.
* Doors should be closed unless the door is required to be open when passing through it.
* The entrance to each high risk area will have signage information provided by and to include the responsible person contact, emergency contacts, any significant hazards and control measures there in e.g. PPE that must be worn.
* Safety signage displayed will include pictograms depicting hazard warnings (yellow triangles) and mandatory control measures (blue circles). These must be regularly reviewed by the responsible person and kept up to date.
* Out of hours access for staff and students is limited to those who have been granted key card access to the main entrance, corridor and area access control system. This is only granted after Departmental health and safety induction and/or the area induction have been completed along with a risk assessment that includes out of hours working controls and an access request approved by the supervisor/PI
* Access may be revoked at any time if non-compliance, such as not signing in the log book, or staying beyond time boundaries, or other rules are not followed.
 | Low | A |
| Working in high risk areas**E=essential** | Lack of knowledge and experienceLack of competence and/or trainingInadequate risk assessment of work and/or situations | The individual and others in the vicinity and buildingLack of competence and/or trainingInappropriate action or lack of action could lead to incidents and injuries which supervision and training could have avoided | * Induction, including identified specific equipment and technique training must be provided by the PI/manager or competent delegate and local records kept.
* Training and development to a competent state must be an on-going process managed by the PI/Manager, competence must be recorded.
* Training and competency must follow guidance set out in by the Faculty
* Training needs analysis for any task specific and knowledge related aspects of work need be identified for workers in the area by the PI/Manger as required. This process must be repeated regularly to ensure competence is maintained.
* Workspace users to be made aware of Department Health and Safety Policy, the contents of it and where it is located during workspace inductions
 | Low | A |
| Working in high risk areas**E=essential** | Thermal comfortExtremes of heat and cold effect ability to work/concentrate/manipulate experiments | Staff, students and visitors.Failure of the system can result in uncomfortable temperatures | * Staff/students must report any failings or concerns to Estates (Helpdesk) by calling 52424 or using the on-line reporting form.
* Staff/students should also report to their manager/PI.
* Fan heaters or air conditioning units are not to be brought into the space unless facilitated by Estates.
 | Low | A |
| Working in high risk areas**E=essential** | General VentilationEquipment failureInsufficient ventilation either natural or forced | Staff, students and visitors. LethargyDiscomfortLack of ventilation decreases the supply of fresh air and could affect temperature and/or odour within the area leading to adverse health effects | * High-risk areas are subject to regular air changes.
* Provision is managed and maintained by the Estates function.
* Faults are reported to the Estates helpdesk by area users.
* If it is suspected that ventilation/make-up air is not functioning correctly, the contact number for estates is x52424 from an internal phone or 0161-2752424 from an outside line /mobile.
 | Low | A |
| Working in high risk areas**E=essential** | Inadequate lighting | Staff and students, Visitors.Eye strainTrips/falls/slipsImpact injuriesMay walk into something or something may fall onto individual as they reach for an item | * Lighting levels are maintained as the building was designed and Estates maintain the infrastructure and change/fix the lighting on request. Report any concerns to Estates (Helpdesk) by calling 52424 or using the on-line reporting form
* Windows are provided for natural lighting.
* Good housekeeping is in place to minimise items that individuals may trip over if lighting is low.
 | Low | A |
| Working in high risk areas**E=essential** | Poor housekeeping | Staff and students, Visitors.Stress from not being able to locate items. Tripping up on unexpected items. Cuts/falls/bruises/sprains/strains from slipping on items left on the floor or surfaces.Items can act as fuel for fire.  | * Reasonable standards of housekeeping are regularly maintained, and checks recorded on a monthly basis by users.
* Staff and students agree during induction to read and abide by the Department’s health and safety policy which states the guidelines for housekeeping.
* Refer to activity “fire”.
 | Low | A |
| Working in high-risk areas**E=essential** | Lack of spaceSafe access and egress | Staff and students, Visitors.Bruises, sprains and strains - lack of space can lead to injuries through collisions with furniture, equipment or other persons. Egress is restricted or prohibited by items stored incorrectly. | * Use of appropriate sized furniture.
* Reasonable standards of housekeeping are maintained and checked on a monthly basis by users. Staff and students agree during induction to read and comply with the Department’s health and safety policy which states the guidelines for housekeeping.
* Space is kept between equipment to enable safe entry and exit, minimum 1.5m
* For rooms with single entry/exit point flammable materials are stored as far away from the entry/exit point as possible to maximise the maintenance of safe exit routes in the event of a fire/incident.
 | Low | A |
| Working in high-risk areas**E=essential** | Poor Hygiene | Staff and students, Visitors.DiscomfortInadequate cleaning, water burn, no towels can lead to dermatitis | * Water temperature at hand wash sink can be adjusted and is limited at source.
* Soap and paper towels are provided and maintained by area staff or users
 | Low | A |
| Working in high-risk areas**E=essential** | Water/Legionella | Staff and students, Visitors.Legionnaires disease could be contracted from inhalation of water aerosol containing the bacteria from unmanaged/treated water systems | * Any hoses, water transfer systems or other equipment that have been identified as potential sources of Legionella (i.e. those not used on a daily or weekly basis) are flushed on a weekly basis for two minutes to reduce the possibility of a Legionella outbreak. This should be recorded.
* Eye wash stations and emergency showers should be flushed for 2 minutes every week and recorded locally.
* PIs/Managerare responsible for any research or teaching which uses specific water storage facility such as water baths or coolers and for managing the risk of Legionella arising from such facilities.
* PI/Manager to ensure any potential Legionella containing substances (such as coolant in workshop equipment) is tested and replaced as necessary.
* Labcup would be a suitable asset management system to manage this process.
 | Low | A |
| Working in high-risk areas**E=essential** | Waste management/ disposal | Staff and students, visitors.Discomfort from poor housekeeping and odours | * A variety of waste bins/streams are supplied for recycling and disposal needs. These are covered in local Induction.
* House services staff dispose of general waste regularly and as requested by area staff or technical teams.
* Hazardous waste including Chemical waste is dealt with by those who generate it following risk assessment. Disposal of waste on a routine basis via the correct waste route as advised by the Technical team usually via hazardous waste stores.
* Disposal may be in-house or, for hazardous chemicals, using an external contractor via the Hazardous Waste stores facility.
* Spill kits are provided if required and the area induction process ensures users are aware of how to use and replenish them. Spillages must be cleaned up as soon as is practicable and disposed by consulting the technician team and/or Department Safety Office.
* Chemical hazards are assessed via experimental RAs including waste requirements.
* Waste disposal processes are in place for other waste types, see local rules.
 | Low | A |
| Working in high-risk areasSitting or standing **E=essential** | Lack of or inappropriate seating Chemical contact | Staff, students, visitors.Aches and pains from sitting down (tired legs, injuries/illnesses) and seating is not available. Contaminated seating may cause injury e.g. dermatitis and burns. | * Suitable seating is provided in all areas as required.
* The seating is and must be wipe-clean (not fabric) in wet chemistry areas and chemical spillage onto seats must be dealt with immediately. Contaminated seats must be removed from use and segregated until cleaned and dry and may need to be disposed of, depending on the chemical.
* Ergonomic hazards are dealt with separately.
 | Low | A |
| Working in high-risk areas**E=essential** | Use of mobile phones/devicesEarplugs and earphones | Staff, students, visitors.Lack of awareness within surroundings leading to vulnerability.Unable to hear instructionsUnable to hear fire alarmsDistraction from work activitiesChemical contamination of phone/device. | * The use of mobile phones/devices is limited within high-risk areas to use for researching/looking up information in relation to work being carried out or accessing appropriate work-based applications.
* The use of earplugs and earphones is *prohibited* within this area.
* If allowed all those wearing earplugs and headphones must have the sound level where they can still be aware of the people and activities around them to respond in an emergency.
* Care must be taken to ensure cross contamination does not occur.
 | Low | A |
| Working in high-risk areas**E=essential** | Ingestion of substances leading to ill-health  | Staff, students, visitors.Eating and drinking I the work area leading to ross contamination or ingestion of hazardous substancesContamination of equipment with food and/liquids may lead to malfunction | * Eating and drinking is *prohibited* in high-risk areas.
* In some spaces e.g. working with chemicals or soldering, this is prohibited.
* Suitable rest facilities away from the work area are provided.
 | Low | A |
| Traversing around the high risk area.**E=essential** | Uneven or damaged flooring | Staff, students and visitors.Chemical burnsImpact injuriesSprains and StrainsInappropriate footwear can catch in flooring that changes level or is in dis-repair, causing trips, slips and falls. | * During induction, individuals are advised of the requirement to wear flat, closed toe, wipe-clean shoes.
* Regular checks of the area by users, PIs, managers and Safety Office monitor this.
* Staff/students must report any failings or concerns to Estates (Helpdesk) by calling 52424 or using the on-line reporting form.
* Care should be taken in high risk areas at all times to help prevent injuries or incidents.
 | Low | A |
| Traversing around the high risk area.**E=essential** | Obstructions and/or spillages  | Staff, students and visitors.Slips, trips and fallsBruisesSprainsStrainsFractures | * Reasonable standards of housekeeping are maintained and checked on a monthly basis by users. Staff and students agree during induction to read and abide by the Department’s health and safety policy which states the guidelines for housekeeping.
* Trailing cables must be positioned neatly away from walkways or highlighted with hazard tape.
* Faults, repairs and maintenance are reported immediately to Estates (Helpdesk) for repair/replacement
* Floors kept clean, dry and clear of obstructions particularly exit routes. Spillages to be cleared immediately – spill kits are available.
* Cabinet drawers and doors are kept closed when not in use
* Waste bins are supplied for general and recyclable waste reducing the build-up of rubbish in corridors and spaces.
* Marked pathways are followed.
* Adequate lighting is based on identified activities/tasks in the areas as deemed sufficient during building design specification. Emergency lighting will turn on if standard lighting system is faulty to ensure there will always be light in the areas.
* Signage is posted on the doors informing all users of emergency protocols and the telephone number for Security and first aiders if medical help is needed
 | Low | A |
| Use of display screen equipmentRepetitive/prolonged use of equipment or tasks**E=essential** | Incorrect posture whilst using DSEIncorrect workstation set upProlonged use without breaksElectrical hazards | Staff and students.Musculoskeletal injuries/disabilitiesLimb disordersEye strainHeadachesBack painRepetitive strainFatigueElectric shock | * Provision of an adjustable chair, adjustable screen height, suitable and sufficient lighting is maintained in each area. DSE signage detailing advice for correct use of the chair, screen and seating position are posted in each PC cluster and on StaffNet.
* Set up workstation to a comfortable position with good lighting and natural light where possible
* Take regular breaks away from the screen, at least some activity or stretching every 20mins and a 5min break away from the workstation every hour.
* Regularly stretch your arms, back, neck, wrists and hands to avoid repetitive strain injuries. Refer to workstation exercises [here](http://www2.posturite.co.uk/downloads/resources/Workstation-Exercises.pdf)
 | Low | A |
| Manual Handling Carrying, lifting, pulling, pushing heavy loads e.g. furniture, PCs, stationery, other Lab equipment, rigs and chemicals.**E=essential** | Manual Handling Damage to equipmentSpillage of chemicals | Staff, PG students and visitors.Back pain bruises, sprains, strains, fractures.Improper manual handling- incorrect posture/lack of awareness. Carrying or moving heavy items can cause pain, sprains, strains, fractures and if dropped, fractures / bruises may result. | * Staff are trained via SLD courses ([TLCO510](https://app.manchester.ac.uk/training/profile.aspx?unitid=8344&parentId=4&returnId=4&returntxt=Return%20To%20Search&returnQs=%3fterm%3dmanual%26org%3d0) or [TLCA500](https://app.manchester.ac.uk/training/profile.aspx?unitid=8576&parentId=4&returnId=4&returntxt=Return%20To%20Search&returnQs=%3fterm%3dmanual%26org%3d0) as appropriate), and familiar with correct handling technique and seek assistance when needed. Maximum load any person may lift is 25 kg at waist height – this may be less depending on the individual and any lift above the shoulder or below the knees.
* Any manual handling that falls outside of the scope of the manual handling training or is particularly complicated must be specifically risk assessed. Please see Faculty manual handling checklist to aid users in considering the risks associated with manual handling
* Some items may need more than one person to handle. Loads are broken down into smaller, more manageable weights and sizes where possible; journeys are planned to minimise the time an object is handled. Additional staff are used to open doors and assure clear passage.
* Lifts used rather than stairs when possible.
* Adequate rest breaks are taken; handling activities are distributed throughout the team; staff with known health conditions are not asked to do tasks that may aggravate an existing condition
* Perform kinetic lifting with feet apart, load held close to body and in front of individual
* Plan route to avoid uneven or poor-quality surfaces
* Identified manual handling equipment is inspected at least annually and records kept locally. Labcup would be a suitable asset management system to manage this process.
 | Low |  |
| General use of equipment**E=essential** | Equipment related hazards | Staff, students and visitorsEntanglement, entrapment and impact/crush injuries | * All equipment use is suitably risk assessed.
* All users have received sufficient training. Training records are kept.
* All users are supervised appropriately until competence is assured and recorded.
 | Low | A |
| Use of electrical equipment**E=essential** | Electricity | Staff, students and visitors.Electric shock by contact with defective parts or live wiresBy not following procedures and/or resetting trips without authorisation Fires, burns, electrocution from powering components connected to the mains power source that may be defective Can cause fire and/or burns | * In addition to general use of equipment control measures listed above;
* If an electrical circuit trips out and the equipment stops working contact estates (52424), (external line: 0161 275 2424). Only the Estates function must reset tripped circuits. Access to electrical/fuse boxes is prohibited for all other staff. ALWAYS wait for estates to check the circuit before attempting to use the equipment.
* All portable electrical equipment in high-risk areas is tested at least annually on the portable appliance testing (PAT) schedule. Electrical items are labelled with the test expiry date.
* All fixed electrical equipment in high-risk areas is tested at least 5 yearly on the fixed appliance (FAT) schedule.
* All new or recently acquired portable electrical equipment must have a portable appliance test. This includes items brought from home.
* All equipment that has been permanently relocated to be PAT testing before use.
* All mains powered home-built equipment requires PAT testing before use
* For high voltage equipment (above 1000V) see separate section below.
* Use equipment as per manufactures guide.
* Visual inspections of equipment for obvious defects are carried out with any defects reported and use stopped immediately.
* PAT stickers are checked for validity.
* Training covers the need to ensure that electrical equipment is kept dry making sure that wires and cables never make contact with liquids. Extra care is taken when filling water systems not to get electrical components wet.
* Items are switched off and made safe after use.
 | Med | A |
| Work at Height **B=bespoke / W=work related** | FallsFalling objects | Staff and students, visitors, external contractorsUsers fall from ladders or other height or drop items which can injure others through direct impact or indirectly through damaging equipment  | * Users who are required to use steps, ladders or other access equipment must complete the working at height training course available through SLD [TLCO500](https://app.manchester.ac.uk/training/profile.aspx?unitid=8343&parentId=4&returnId=4&returntxt=Return%20To%20Search&returnQs=%3fterm%3dladder%26org%3d0). Others may use access equipment if essential and if they are supervised.
* Following training, users must read sign and follow the specific working on ladders risk assessment
* Any work at height that falls outside of the scope of the working at height training must be specifically risk assessed e.g. use of tower scaffold, MEWP.
* Identified working at height equipment is inspected at least annually and records kept locally. Labcup would be a suitable asset management system to manage this process.
* Pre-use visual checks must be done by the user EVERY time especially of any locking mechanisms.
* Different types of working at height equipment e.g. access steps, ladders, foot stools, are available to allow users to choose the most appropriate for the task. Some equipment has extra control measures e.g. some access steps contact with the ground when stood upon.
 | Med | A |
| Use of equipment**B=bespoke / W=work related** | Contact with hot surfacesProlonged exposure to high temperatures  | User and others in the areaContact can cause burns and/or fire if combustible materials in vicinity | **In addition to general use of equipment control measures listed above;*** Display warning signs in the area to warn of high temperatures and hot equipment.
* Users allow samples/equipment to cool before handling and/or use heat resistant gloves for hand protection (BS EN07).
* If handling hot items cannot be avoided heat resistant gloves and appropriate handling equipment e.g. tongs are used.
* Good working practices in place: tidy workspace, free from combustibles and flammable materials, safe location for tool cooling.
* PPE: lab coat, safety glasses (BS EN 166) and heat resistant gloves for hand protection (BS EN 407) are utilised as appropriate.
* Temperature is monitored for correct and stable temperature with calibrated thermocouple and never left unattended without experiment in progress sign.
* Equipment is switched off after use.
 | Med | A |
| Use of hand tools (like Sharp / pointed tools, Scalpel blade, and so on).**B=bespoke / W=work related** | Sharp cutting edges | Users /Others in proximity / VisitorsRisk of cuts and puncture injuries | **In addition to general use of equipment control measures listed above;*** Use of ‘open bladed’ tools, e.g. scalpels is avoided if possible or substituted e.g. Scissors.
* Users make safe after each use, e.g. razor blades to be put in sharps bin after use, knives to be replaced into protective cover.
* Items are placed in safe storage immediately after each use. Cutting tools should never be unattended.
* Cutting tools are not placed too close to the edge of a workstation to avoid falling off onto legs and feet
* Use of cut resistant gloves are considered when appropriate.
* Safe cutting techniques are used e.g. cut away from the body and away from the hands and fingers
 | Med | A |
| Use of Local exhaust ventilation (LEV)E.g. in fume cupboards, extractions hoses...**B=bespoke / W=work related** | LEV failure or inadequate flow leading to exposure to hazardous substances | Staff, Students and VisitorsContamination or exposure to airborne substances in the area or external to the building (e.g. the roof) where the LEV vents to due to failure of the LEV, lack of knowledge, failure or lack of alarms, inadequate pre-use/monthly checks | * All users must be trained/instructed to use fume cupboards or other extraction equipment that relies on functioning LEV to minimise exposure as identified as part of the induction process. Users must also be instructed on how to ensure LEV is operating effectively, how to carry out pre-use checks and how to report issues.
* All LEV should be captured on the Allianz system and subject to statutory inspection in line with written scheme of examination. This is at least every 14 months.
* LEV must be checked prior to use as per check sheet with records kept.
* LEV must have a monthly self-inspection that highlights any issues if a pre use check has not been completed within that month.
* LEV must have a velocity check monthly with records kept.
* Any faults identified are reported to the Estates helpdesk and Department Safety Office as soon as possible and the LEV put out of service until repair.
* Recirculating LEVs require annual service and records recorded on labcup.
* Estates contact the department to discuss potential work that may impact on LEV.
 | Med | A |

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| **Action plan** |
| **Ref No** | **Further action required** | **Action by whom** | **Action by when** | **Done** |
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