

# General ECS Teaching Lab Risk Assessment


<b>Work activity / task</b>	Access to and working in the following list of ECS teaching or project labs : <b><u>B16.1005, B16.1003, B59 LEVEL 2</u></b>
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<b>Assessor(s)</b>	Jeff Hooker	<b>Responsible Manager</b>	David Oakley	<b>Date</b>	19/06/2015
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<b>Faculty / Service</b>	Electronic and Computer Science	<b>Academic Unit / Team</b>	ECS	<b>Location</b>	B16, B59
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<b>Brief description of activity / task</b>	This risk assessment forms part of ECS Labs Induction Process. The hazards and risks highlighted in the assessment are generic to the lab areas and has been produced so anyone (staff/students/contractors/visitors) who require access to work or visit any of the above listed labs (or associated Technicians Areas) will be briefed and required to sign the assessment to gain access and to formally acknowledge the safety policies and procedures in force.
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<b>Additional notes</b> (eg, references, persons at risk, risk factors, etc) <b>[optional]</b>	Specific risk assessment for working on or using certain equipment are issued separately (i.e. HV, 3-Phase, Tensiometer, 3D printer, laser cutter)
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<b>Declaration by responsible manager:</b> I confirm that this is a suitable & sufficient risk assessment for the above work activity / task.					
<b>Signed</b>		<b>Print name</b>	David Oakley	<b>Date</b>	19/06/2015

# Health & safety risk assessment: A basic guide

- (1) **Identify all hazards, hazard events, and reasonably foreseeable worst case consequences.**  
A 'hazard' is something with the potential to cause harm (ie, injury or ill-health). A 'hazard event' is the incident where the harm from the hazard occurs. A 'hazard consequence' is the nature and extent of the harm caused.

**'Reasonably foreseeable worst case consequence':** 'Worst case' means it is not necessarily the most likely consequence that should be considered, but, 'reasonably foreseeable worst case' means that far-fetched, improbable hazards and consequences need not be considered.

- (2) **Estimate inherent risk for each hazard.** 'Inherent' risk is that without any controls applied.

**Risk:** Is likelihood of the hazard event and the reasonably foreseeable worst case consequence combined.  
In estimating risk, also consider factors that could exacerbate risk, such as reasonably foreseeable emergencies, inexperience, lone work, new & expectant mothers, waste disposal, potential effects on others such as contractors or visitors, etc. A separate 'row' for a particular hazard / event / consequence may be needed to account for these. Estimate risk using the matrix on the next page, and place an X in the appropriate box.  
'High' risks must be reduced before activity / task can commence or continue.  
'Medium' risks must be reduced as much and as soon as is reasonably practicable.

- (3) **Devise controls for each hazard.** A 'control' is a measure taken to reduce risk.

**Controls:** As a general principle, the 'hierarchy' of control that is to be applied (from most to least preferable) is: avoid the risk; substitute something less hazardous that gives same or similar outcomes; 'engineering controls' (ie, equipment and articles that mitigate or contain a hazard); 'safe system of work' (ie, a prescribed work method); and 'personal protective equipment' ('PPE', eg, gloves, safety glasses, respirator, boots, etc). So, PPE is a last resort. Other controls that should be considered: training, supervision, planning for reasonably foreseeable emergencies, health surveillance, validation and maintenance of any engineering controls, and correct specification of any PPE.  
'Low' risks, by definition, do not require controls.

- (4) **Estimate residual risk for each hazard.** 'Residual' risk is that with controls applied.

Residual risk is estimated as above, and the objective is for all risks to be low so far as is reasonably practicable.

- (5) **The responsible manager, supervisor, research leader, principal investigator or project leader must sign the Declaration on the front page.**

- Health & safety risk assessments must be 'suitable and sufficient', ie, cover all relevant issues and include enough detail.
- It is activities / tasks that should be risk assessed, and not, as such, substances (but rather use of substances), or equipment (but rather use of equipment), or locations (but rather activities therein), or people (but rather what they do).
- This template is for 'general' health & safety risk assessment, suitable for most hazards, but certain hazards do require additional regulatory and technical detail (eg, ionising radiations, biological agents, genetic modification, noise, hazardous chemicals, etc).
- Health & safety risk assessments can be generic, provided they remain 'suitable and sufficient'.
- Health & safety risk assessments need to be reviewed periodically (at least every two years or sooner if inherent risk is high), and also after incidents, after significant changes to the activity / task, if staff raise any concerns, if there is a relevant change to the law or to other relevant standards, or if there is anything to suggest the assessment is not suitable or sufficient.
- You may remove pages 3 and 4 from the final assessment.

# Health & safety risk estimation matrix

**High risk** – requires controls to reduce risk before activity / task can commence (or continue).

**Medium risk** – requires controls to reduce risk as much and as soon as is reasonably practicable.

**Low risk** – all risk should be reduced to this tolerable level, so far as is reasonably practicable.

Reasonably foreseeable worst case consequence Likelihood <sup>3</sup> of hazard event	Minor superficial injury; or slight and temporary health effect	Moderate significant injury or illness <sup>1</sup> ; or temporary minor disability	Major serious injury or illness <sup>2</sup> ; or significant or permanent disability	Critical fatal injury or illness; or substantial and permanent disability	Catastrophic fatal injury or illness for multiple persons
<b>Likely</b> high probability, 1 in 10 chance or higher, once in two weeks or longer for activities on a daily basis	medium risk	high risk	high risk	high risk	high risk
<b>Possible</b> significant probability, 1 in 100 chance or higher, once in six months or longer for activities on a daily basis	low risk	medium risk	high risk	high risk	high risk
<b>Unlikely</b> low probability, 1 in 1,000 chance or higher, once in four years or longer for activities on a daily basis	low risk	low risk	medium risk	high risk	high risk
<b>Rare</b> very low probability, 1 in 10,000 chance or higher, once in a decade or longer for activities on a daily basis	low risk	low risk	low risk	medium risk	high risk
<b>Almost never</b> extremely low probability, less than 1 in 100,000 chance, once in a century or longer for activities on a daily basis	low risk	low risk	low risk	low risk	medium risk

<sup>1</sup> 'Significant injury' could include, for example, laceration, burn, concussion, serious sprain, minor fracture, etc.

'Significant illness' could include, for example, dermatitis, minor work-related musculoskeletal conditions, partial hearing loss, etc.

<sup>2</sup> 'Serious injury' could include fracture or dislocation (other than digits), amputation, loss of sight, penetration or burn to eye, electric shock, asphyxia, or any injury leading to unconsciousness or requiring resuscitation or admittance to hospital for more than twenty-four hours. 'Serious illness' could include, for example, requiring medical treatment after chemical, biological or radiological exposure, severe debilitating musculoskeletal conditions, severe dermatitis, asthma, etc.

<sup>3</sup> For likelihoods in between the listed values, use the higher likelihood to estimate risk. These probability definitions are only a guide.

Hazards, hazard events, and reasonably foreseeable worst case consequences	Inherent risk (no controls) from matrix (mark with X)		Controls (measures to reduce risk)	Residual risk (with controls) from matrix (mark with X)	
1) Exposure to Chemicals [X]	High	X	<p>All chemicals when not in use, are to be stored in either metal cabinet in the laboratory (refer to lab manager) The chemical inventory list must be up dated if the chemical is <u>new to the laboratory</u> and also must have an up to date MSDS form, which is to be added into the MSDS folder. When using the chemicals, any appropriate Personal Protective Equipment (PPE) <b>MUST</b> be worn, such as gloves, safety specs. If the chemicals require proper ventilation, this must be taken into account before adding this to the Laboratory. The laboratory has an eye wash and first aid kit available, and all work carried out must consider spillage &amp; disposal controls . All beakers/bottles/vials must be correctly labelled with the chemical name, hazards, the date and the users name on it.</p> <p><b>Students &amp; project supervisors are responsible for providing COSHH &amp; MSDS data along with advised risk controls.</b></p> <p>Useful resource: <a href="http://www.hse.gov.uk/coshh/essentials/">http://www.hse.gov.uk/coshh/essentials/</a></p>	High	
	Medium			Medium	
	Low			Low	X
2) Exposure to High Voltage, current or temperatures [X]	High	X	<p>.No exposed voltages greater than 30V DC or 30Vrms AC. Any mains equipment is not to be used without a valid electrical test label/certificate. The mains supply must not be tampered with. The electrical 230V ring main has RCD in the circuit. Projects incorporating potentially high voltage/current must provide safeguards to limit exposure and possibly limit the voltages/currents/power accordingly.</p> <p>It is the responsibility of student and project supervisor to provide additional data regarding risks &amp; controls for individual or group projects.</p> <p>SEE ALSO - NEW EQUIPMENT SEE ALSO - Component overheating / explosion</p>	High	
	Medium			Medium	
	Low			Low	X
3) Exposure to potentially hazardous waste chemicals/sharps [X]	High		<p>All hazardous waste is to be disposed of in the appropriate manner. Waste or chemicals with expired dates are to be weighed and then placed into a plastic bag, with a details of what the chemical is and contact name. Then contact the Laboratory Manager who will then contact the relevant person to get the chemicals disposed of. All sharps are to be only placed in the yellow waste bins, <u>not in the general waste bins</u>. Any potential toxic waste is to be placed into a sealed bag/box, with the relevant information on the bag/box such as, name of chemical, the potential hazard, the amount/weight, the data and the contact details of the user. The laboratory manager will then arrange for the waste to be collected and then disposed of via the university hazardous/toxic waste policy.</p>	High	
	Medium	X		Medium	
	Low			Low	X

Hazards, hazard events, and reasonably foreseeable worst case consequences	Inherent risk (no controls) from matrix (mark with X)		Controls (measures to reduce risk)	Residual risk (with controls) from matrix (mark with X)	
4) Exposure to fumes from chemicals [X]	High	X	<p>When using chemical that are either irritant or can cause issues with the respiratory system, the exposure must be kept down to a low levels. If there are any concerns with the use of a chemical or solution please see the laboratory manager or School Safety Officer.</p> <p>Students &amp; project supervisors are responsible for providing COSHH &amp; MSDS data along with advised risk controls.</p> <p><b>Useful resource:</b> <a href="http://www.hse.gov.uk/coshh/essentials/">http://www.hse.gov.uk/coshh/essentials/</a></p>	High	
	Medium			Medium	
	Low			Low	X
5) Security of the Laboratory [X]	High		<p>Only authorised users are allowed to use the facilities in the laboratory. Non-authorised users are allowed to enter the laboratory but they must be with an authorised <u>member of staff</u> at all times. Authorised users must not hand over their cards to non-authorised users. The door also must not be left open or not unlocked for long periods of time. Do not allow 'tail-gating'.</p> <p>This is also to stop unauthorised persons from entering the laboratory which might result in equipment being removed/damaged.</p>	High	
	Medium	X		Medium	
	Low			Low	X
6) Injuries: Fire, burns and smoke inhalation [X],	High	X	<p>All exit routes (normal and emergency) must be kept clear at all times, and not used for storage. Smoke detectors, alarm call points, fire extinguishers, etc must not be obstructed or interfered with. Such items are routinely maintained and tested by Estates &amp; Facilities. Fire doors must be kept closed and not obstructed.</p> <p>Minimise storage of combustible materials overall. Ensure all cardboard and paper is immediately disposed of into the correct bins.</p> <p>Avoid use of hot plates if at all possible, otherwise they must not be left on when unattended and must be switched off and unplugged when not in use. They must be kept away from combustible materials, and must not be covered. Hot plates to carry a sign 'HOT' when in use or cooling down.</p> <p>Evacuate as soon as alarm sounds. Cooperate with fire marshals and fire drills</p>	High	
	Medium			Medium	
	Low			Low	X

Hazards, hazard events, and reasonably foreseeable worst case consequences	Inherent risk (no controls) from matrix (mark with X)		Controls (measures to reduce risk)	Residual risk (with controls) from matrix (mark with X)	
7) Injuries : Falls (on same level);  Sliding on a slippery floor surface or tripping over an obstruction or damaged flooring;  Significant injury such as a broken wrist, twisted knee, wrenched back etc. [X]	High	X	Immediately clean up any spillages, even small spills, and ask colleagues to do likewise. Display a yellow warning sign if a slip or trip hazard remains.  Ensure no obstruction such as papers, files, boxes, wires, rucsacs are left on the floor and that trailing cables are eliminated or made secure. Report damaged flooring lab manager / School Safety Officer for urgent attention. Mark problem area clearly with tape so area is not a trip hazard.  Report any faults to lab manager / School Safety Officer immediately..	High	
	Medium			Medium	
	Low			Low	X
8) Injuries : Falling objects;  Files, books, boxes, etc falling from shelves, shelves detaching from walls, filing cabinets falling over, etc; [X]	High		Do not overload shelves. Get loose or doubtful shelving repaired. Do not use before repair has been completed. No heavy or large items to be stored above shoulder height, including storage on top of cupboards. Make sure any object is tested for weight before lifting.  Filing cabinets must have a functioning mechanism to prevent more than one drawer being opened at a time. Do not leave drawers open. Fill filing cabinets from the bottom drawer upwards.  Supply kick stools when necessary	High	
	Medium	X		Medium	
	Low			Low	X
9) Injuries : Work at height;  Fall from a height (less than 1 m in an office environment);  Significant injury such as a broken limb, wrenched back, severe contusion, e.t.c. [X].	High		Do not stand on chairs, desks, tables, etc.  If you need to reach up, obtain a suitable kick stool or step-ladder. Make sure the step ladder is suitably positioned. Do not lean on a step ladder or kick stool. Step-ladders must have regular recorded safety checks. Sensible footwear is needed for such tasks	High	
	Medium	X		Medium	
	Low			Low	X

Hazards, hazard events, and reasonably foreseeable worst case consequences	Inherent risk (no controls) from matrix (mark with X)		Controls (measures to reduce risk)	Residual risk (with controls) from matrix (mark with X)	
10) Emergencies : Lone Working [X]	High		By arrangement with the School Safety Officer, a separate risk assessment has to be carried out with regard to working outside the normal working hours of 08:00 to 23:00 (including separate university closure periods/dates normally communicated by the School Safety Officer) Any user must be aware and have asked permission to work outside of these dates/hours, and the instruction laid out in the lone working risk assessment must be followed.	High	
	Medium	X		Medium	
	Low			Low	X
11) Injuries : Musculoskeletal / DSE;  Incorrect working posture and/or incorrect workstation setup and/or poor work habits / pattern;  Debilitating and painful musculoskeletal injury such as tendonitis in the wrists, tennis elbow, carpal tunnel syndrome, chronic shoulder, neck or back pain [X].	High		Successful completion (staff and PGRs only) of the online by DSE training and assessment package (contact your Faculty/Service Health & Safety Officer) to be completed by all new staff members.  Any issues identified as a result to be resolved by local Faculty/Service DSE assessors and any significant musculoskeletal problems are to be referred to Occupational Health.  Correct working posture and workstation setup (as per the online package) should be adopted, and regular breaks to be taken (at least 5 mins every hour).  Avoid clutter on, under and around work desks – apply ‘good housekeeping’	High	
	Medium	X		Medium	
	Low			Low	X
12) Injuries : NEW EQUIPMENT related [X]	High	X	Any new pieces of equipment/process or equipment/process being bought into the laboratory must have, permission from the Laboratory Manager and also a brief work plan. This is to show the laboratory manager that the equipment/process is safe to be used in this laboratory and this also shows the laboratory manager that the person wanting to use or bring in the equipment/process has thought about the dangers/hazards and what pre cautions are required and what is in place. Brought-in mains powered equipment must undergo a PAT safety test c/o qualified departmental technician SEE LATER SECTION : Safety check of electrical devices in the laboratory (PAT testing	High	
	Medium			Medium	
	Low			Low	X

Hazards, hazard events, and reasonably foreseeable worst case consequences	Inherent risk (no controls) from matrix (mark with X)		Controls (measures to reduce risk)	Residual risk (with controls) from matrix (mark with X)	
13) Debris, Food & Drink in proximity with equipment [X]	High		<p>The laboratory is to be kept in a clean and safe state at all times, Laboratory 1005 has benches &amp; areas where work can be carried out but once completed, the work area must be cleaned and the area left clear and ready for the next user.</p> <p><b><u>Absolutely no opened food or drink allowed in the Lab.</u></b></p> <p>Not only is this a good general work place practise, this is also to minimise any potential dangers regarding safety. This is the responsibility of everyone who uses the laboratory: if a untidy area has been discovered without proper labelling or identification of user or hazards, the laboratory manager is to be informed ASAP</p> <p><b><u>Use the appropriate bins provided in the lab</u></b></p>	High	
	Medium	X		Medium	
	Low			Low	X
14) Injuries : Soldering & rework in room 1005 [X]	High		<p>There are specific rework areas designated in the laboratory (or soldering irons can be issued). Training to use the lab soldering irons can be provided by the Lab manager upon request.</p> <p>Irons in use must be guarded and <b>safety glasses</b> are to be worn at all times when undertaking soldering.</p> <p>Soldering equipment must be switched off when job is finished.</p>	High	
	Medium	X		Medium	
	Low			Low	X
15) Injuries : Component overheating / explosion [X]	High		<p>Use current limit on bench power supplies.</p> <p>Predict and plan for heat dissipation of components.</p> <p>Ensure components connected with correct polarity (eg pin 1 on semiconductors, polarity on electrolytic capacitors).</p> <p>Ensure electrical ratings are compiled with (eg capacitor voltage rating).</p>	High	
	Medium	X		Medium	
	Low			Low	X



Hazards, hazard events, and reasonably foreseeable worst case consequences	Inherent risk (no controls) from matrix (mark with X)		Controls (measures to reduce risk)	Residual risk (with controls) from matrix (mark with X)	
16) Injury due to faulty mains powered equipment : Safety check of electrical devices in the laboratory (PAT testing [X])	High	X	<p>All equipment bought into the laboratory must be safety tested (PAT tested to ensure that the plug and electrical components are in a safe working order. NOTE: The university has a policy where any new equipment must be PAT tested before use - the instrument is then re-tested either every 6 months or every year, and an 'up to date' sticker is placed on the instrument indicating that the instrument has passed or failed.</p> <p>If any equipment is found in the laboratory that either hasn't been PAT tested/PASSED or the label on the instrument is out of date, please immediately contact the laboratory manager, and do not use the instrument until the PAT testing has been carried out. <b><u>Damaged equipment must not be used and must be reported to the lab manager.</u></b></p>	High	
	Medium			Medium	
	Low			Low	X
17) Sudden illness : Welfare/hygiene [X]	High		<p>All normal toilet facilities to be available to all. Conditions in toilets to be monitored and issues raised with Estates and Facilities via School Safety Officer. Do not drink the water from the toilets in B16</p> <p>Signs of illness warranting concern for physical wellbeing amongst colleagues (e.g. fits, collapsing, fainting): inform lab manager / School Safety Officer or other member of staff</p>	High	
	Medium	X		Medium	
	Low			Low	X
18) Injuries : Flying debris [X]	High		<p>Ensure clippings/strippings captured. Use eye protection as necessary (essential for soldering).</p>	High	
	Medium	X		Medium	
	Low			Low	X

Hazards, hazard events, and reasonably foreseeable worst case consequences	Inherent risk (no controls) from matrix (mark with X)		Controls (measures to reduce risk)	Residual risk (with controls) from matrix (mark with X)	
19) Injuries : cuts and abrasions [X]	High		Correct use of hand tools including use of correct tool for task. Use of scalpel/blades : eye protection (mandatory) & hand protection (discretionary) must be used. NOTE : Lab manager available for advice	High	
	Medium	X		Medium	
	Low			Low	X
	High			High	
	Medium			Medium	
	Low			Low	
	High			High	
	Medium			Medium	
	Low			Low	

Hazards, hazard events, and reasonably foreseeable worst case consequences	Inherent risk (no controls) from matrix (mark with X)		Controls (measures to reduce risk)	Residual risk (with controls) from matrix (mark with X)	
	High			High	
	Medium			Medium	
	Low			Low	
	High			High	
	Medium			Medium	
	Low			Low	
Useful Contacts			<p><b><u>USEFUL CONTACTS LIST:</u></b></p> <p>Lab Manager – Jeff Hooker B16.1001 (within 1005)  <a href="mailto:Jh1@ecs.soton.ac.uk">Jh1@ecs.soton.ac.uk</a> tel: X23369  School Safety Officer : Bill Swanton  <a href="mailto:W.Swanton@soton.ac.uk">W.Swanton@soton.ac.uk</a> tel: 22025</p>		

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