Safety Statement

The Department (Discipline) of Mechanical & Manufacturing Engineering

and the

Trinity Centre for Biomedical Engineering

Trinity College Dublin.

Written: January 2004 by Garrett Lyons & Adriele Prina-Mello
Revised: 31 May 2006; 4 September 2006
22 May 2008 by John Gaynor
16 April 2009 by John Gaynor
8 October 2012 by Dermot Geraghty
24 September 2013 by Tim Persoons
4 January 2014 by Gerry Byrne and Conor Buckley
1 April 2014 by Gerry Byrne
10 January 2017 by JJ Ryan and Tim Persoons
29 November 2018 by JJ Ryan, S. Carroll, M. Reilly
31 August 2019 by Simon Carroll
2 September 2019 Tim Persoons Derek Simpson
17 September 2019 by Simon Carroll
02 November 2019 Simon Carroll & Derek Simpson

This document should be read in full

Safety Statement Introduction:

To ALL

It is a requirement that all Staff, Undergraduate and Postgraduate students and Visiting Students and Researchers familiarise themselves with the Departmental Safety Statement, especially the sections relating to you. The Departmental Health and Safety Webpage can be found at https://www.tcd.ie/mecheng/safetystatement/ where you will find the following link to the Departmental Safety Statement https://www.tcd.ie/mecheng/assets/pdf/Safety_Statement.pdf

The **Table of Contents** gives a very comprehensive overview of the Departmental Safety Statement. Once you have read the relevant sections of the statement you are required to sign the appropriate Acknowledgement Form. Information on training courses and schedules is available on the University Safety Office web site. https://www.tcd.ie/estatesandfacilities/health-and-safety/

For those working in TBS I would like to draw your attention to the Section "TCBE Welcome Document" (see Appendices).

Acknowledgement Forms

Instructions on how to complete these forms is given. Two acknowledgement forms are provided; one for Staff and a second for Students including Summer/Occasional students. All MME forms must be completed and returned to the Departmental Safety Officer (Derek Simpson at DSIMPSON@tcd.ie). All TCBE forms must be completed and returned to Dr Simon Carroll. (Simon Carroll at scarrol1@tcd.ie)

Risk Assessment Form

Staff, undergraduates, postgraduates and researchers who are physically undertaking a research project must complete a Risk Assessment Form for each project. Completing a Risk Assessment form is a College requirement. It is it duty of all staff supervising projects to ensure that the student has fully completed the form. The Supervisor/Principal Investigator is then required to sign the form. Guidance on how to complete a Risk Assessment and the form is reproduced in the safety statement. All MME signed forms must be sent to the Departmental Safety Officer (Derek Simpson at DSIMPSON@tcd.ie). All TCBE forms must be completed and returned to Dr Simon Carroll. (Simon Carroll at scarrol1@tcd.ie)

Accident/Incident Report Form

All accidents that occur in the Department i.e. in the Laboratories, computer rooms, research areas, offices and all public areas must be reported to the Departmental Safety Officer (Derek Simpson at DSIMPSON@tcd.ie) using the prescribed form.

Finally, the College hosts unscheduled fire drills during the year. It is a requirement that ALL staff and students fully comply: Staff/Students must follow the Instruction of the Fire Wardens and evacuate the building to the designated assembly area. For the MME building this is the area between College park and the ruby pitch. For TBSI building this is the area outside the front door. Staff with visitors must ensure that their visitors are safely escorted from the building to the designated assembly areas.

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Section I - Safety personnel, training & contact details

Health & Safety Personnel Contact Details

IN THE EVENT OF AN EMERGENCY RING 1999

The internal telephone number 1999 provides immediate access to professional assistance on a 24-hour basis. Be prepared to state:

1. Type of assistance required (ambulance, fire brigade, police etc.)
2. Type of emergency (fire, injury, etc.)
3. Name, extension number and location.

If possible and safe to do so, stay close to the telephone, in order to give further information should it be required by the emergency services.

This number should only be used in a genuine emergency.

Departmental Staff, phone numbers etc., related to safety

Title	Present Holder	email	Tel #
Head of School	Prof Henry Rice	hrice@tcd.ie	1996
Head of Dept.	Prof Ciaran Simms	csimms@tcd.ie	3768
Dept. Safety Officer	Derek Simpson	dsimpson@tcd.ie	1745
TBSI Bio Safety Rep.	Dr Simon Carroll Dr Conor Buckley	Scarrol6@tcd.ie conor.buckley@tcd.ie	8503 2061
VDU Safety Assessor	Ms Judith Lee	julee@tcd.ie	1383
Electrical Safety Rep	Mr Dermot Geraghty	dermot.geraghty@tcd.ie	1042
Chief Technical Officer	Mr Michael Reilly	mireilly@tcd.ie	1557 / 1463
Chemicals & Bio Hazards & Radiation Protection	Mr Peter O'Reilly	poreilly@tcd.ie	1854
Mechanical Safety Rep	Mr Michael Reilly	mireilly@tcd.ie	1557 / 1463
Thermo Lab Safety Rep	Mr Gerry Byrne	gerbyrne@tcd.ie	3523
Dept. Laser Safety Rep	Dr Tim Persoons	tim.persoons@tcd.ie	1936
Design Loft Safety Rep	Dr Conor McGinn	mcginnco@tcd.ie	3767
Manufacturing Engineering Safety Rep	Dr Garret O'Donnell	odonnege@tcd.ie	1184
First Aid	Mr Michael Reilly Mr Alex Kearns	mireilly@tcd.ie Kearnsal@tcd.ie	1557 1463

Fire Wardens	Mr Alex Kearns, Mr Gerry Byrne, Ms Judith Lee, Mr Gordon O'Brien, Mr Gabriel Nicholson Mr Peter O' Reilly	kearnsal@tcd.ie gerbyrne@tcd.ie julee@tcd.ie gordon.obrien@tcd.ie gabriel.nicholson@tcd.ie poreilly@tcd.ie	1463 3523 1383 2396 1463 1854

College Specialist Hazard Officers

The following members of Staff have been appointed by the Board as specialist advisors in the fields outlined below. They advise the College Safety Officer, Local, Faculty and College Safety Committees and the College Community in general on matters relating to their respective fields. If you have a query in relation to safety in the use of lasers, radioactive materials, biologically hazardous materials, fire safety or hazardous chemicals, the relevant specialist in College can be contacted at the telephone numbers or addresses shown.

The College Safety Office		
Location and web-link	Telephone	Email
Estates & Facilities, West Chapel, Trinity College.	01 896 4000	estatesandfacilities@tcd.ie

Head of Safety
Dr Katharine Murray
Estates & Facilities, West Chapel.
Tel: 896 1914
Email: Katharine.Murray@tcd.ie

Safety Officer – Biological Hazards
Dr Mary McDonnell
Estates & Facilities, West Chapel.
Tel: 896 3965
Email: mmcdonn8@tcd.ie

Safety Officer – Radiological Protection
Dr Gillian Gunning
Estates & Facilities, West Chapel.
Tel: 896 2887
Email: gillian.gunning@tcd.ie

Safety Officer – Fire Safety
Mr. Karl Flynn
Estates & Facilities West Chapel.
Tel: 896 3545
Email: karl.flynn@tcd.ie

Bio-Safety and Genetic Manipulation
Dr Henry Windle
Clinical Medicine
Tel: 896 2211
Email: hjwindle@tcd.ie

Hazardous Chemicals
Prof Robert Baker
Chemistry Department, Chemistry Building, College
Tel: 896 3501
Email: bakerrj@tcd.ie

Laser Safety
Mr Christopher Smith
School of Physics, SNIAM, College
Tel: 896 3649
Email: chsmith@tcd.ie

Biohazards – Vacant

General Statement of Departmental Safety Policy

The Department (Discipline) of Mechanical & Manufacturing Engineering is situated in the following buildings:

1. The Parsons Building
2. The Watt Building
3. TBSI
4. Trinity House

For health and safety purposes we may make 2 distinctions, (1) Section A, General Safety in offices, passageways, lecture theatres, 'non-bio' teaching & research labs and workshops, and (2) Section B, Safety for bio-hazard areas ('Trinity Centre for Biomedical Engineering' or 'Biomedical Engineering Centre'). Despite the foregoing conditions, overall responsibility for health and safety rests with the Department. It is the Department's policy to ensure, in so far as possible, the health, safety and welfare of all its staff and students in accordance with the College Safety Policy, the Safety, Health and Welfare at Work Act 2005 and relevant, later, subsidiary legislation and statutory instruments. All reasonable steps will be taken to ensure that no persons – be it staff, students or others – health, safety and welfare is put at risk by, or as a result of the activities of the Department.

In so far as reasonably possible, adequate resources in relation to health, safety and welfare matters will be made available. All affected will receive the necessary, and up to date information, instruction and training and adequate levels of supervision for them to undertake activities in a safe manner. Both proactive and reactive approaches towards health, safety and welfare will be taken. By achieving all the above, the Department will ensure that it meets its objectives for health, safety and welfare by:

- establishing a safe environment for all
- establishing and maintaining safe working procedures for staff and students
- encouraging health and safety as an integral part of work by all staff and students
- developing and maintaining a safety consciousness and a safety culture in all within the Department & Biomedical Engineering Centre
- conforming to the requirements laid down in the Safety, Health and Welfare at Work Act 2005, any further provisions made under the Act, other applicable legislation and the College Safety Statement, College Policies and Codes of Practice documents.

Signed: (Ciaran Simms, Head of Discipline)

Date: 6/11/2019

Safety Responsibilities and Duties

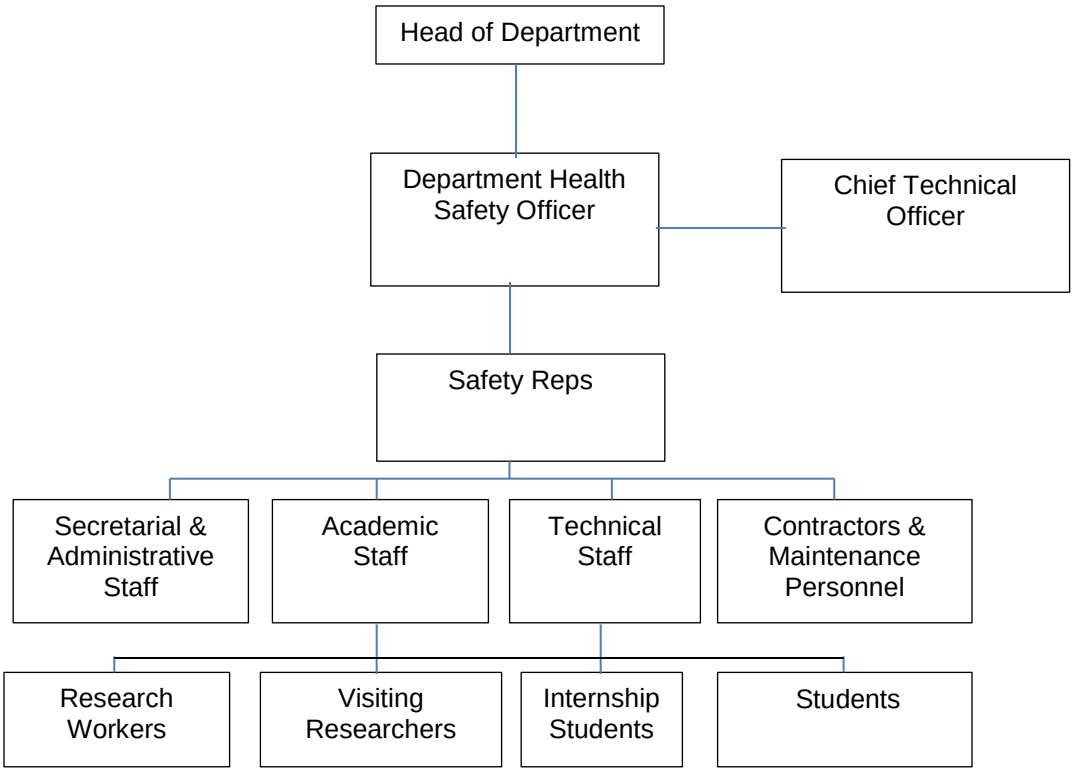
All personnel (staff, students and visitors) have a personal responsibility to ensure the health and safety of themselves and of others who may be affected by their activities within the Department.

Executive Responsibilities

The Head of the Department is responsible for safety in the Department. He / She will appoint another member of the staff of the Department to act in his absence, and a record of the name of this acting Head of Department will be retained in the office of the Department.

The Departmental Safety Officer (DSO) has executive responsibility for safety and reports to the Head of Department. S/He is supported by the Chief Technical Officer. In the event that the Chief Technical Officer is absent from the Department the DSO will perform his/her safety duties.

The organisation chart for health and safety within the Department is given below.



Monitoring Safety Performance

All personnel within the Department have a responsibility to contribute to the continuous monitoring of safety performance within the Department. On a day-to-day basis this can be achieved by forwarding comments, queries and concerns on safety matters to the Departmental Safety Officer or Chief Technical Officer.

In pursuance of the safety policy of the Department, the Departmental Safety Officer will carry out regular safety inspections (at least once per calendar year) and maintain appropriate written records. The results of these inspections will be discussed at Departmental staff meetings.

Any deficiencies in equipment or procedures must be rectified promptly. Where equipment is deemed to be unsafe **it must not be used** until corrective action is taken.

The Departmental Safety Officer will maintain a detailed record of all accidents, incidents, injuries, property damage and near misses. These reports will be discussed at the regular meetings of the discipline prior to been sent to the School and college.

The Departmental Safety Officer will conduct an annual Safety Audits of the Department in collaboration with the Chief Technical Officer and the College Safety Officer, and reports on these audits will be given to the Head of Discipline.

Safety Training

A variety of safety training courses are organised throughout the year by The College Safety Office and the Dept. actively encourages participation. Fire safety training is mandatory for demonstrators and Technical Officers working in undergraduate teaching labs. Additional training may also be mandatory for personnel working in special hazards areas.

Details of scheduled Safety Training courses can be found on the College Health & Safety website: https://www.tcd.ie/estatesandfacilities/health-and-safety/Safety-Training/

Section II - General Safety Rules in the Parsons Buildings

The following are the general safety rules which apply to all personnel within the building, including staff, students and visitors.

Note: All accidents/incidents must be reported to either the DSO or the Chief Technical Officer who will complete the statutory 'Accident/Incident Form', a copy of this form is then sent to the College Safety Officer who registers all accidents in College

Additional more specific safety rules apply to the personnel working in the following areas:

- Undergraduate Teaching Laboratories,
- Workshops.
- Research Laboratories.
- The Trinity Centre for Biomedical Engineering's laboratories

These are discussed in sections II, III and IV below.

Access to Parsons Building.

The normal opening hours for the Department are 0830- 1800 hours, Monday to Friday.
Although free access is available to most Department buildings during normal working hours, access outside normal working hours is limited strictly to authorized staff, postgraduate students, authorised students, visitors and contractors. Contractors & maintenance personnel must be made aware of the hazards in the areas to which they are admitted and hence must report their presence to the Chief Technical Officer.

Smoking in College:

Under the Tobacco Smoking (Prohibition) Regulations, 2003, tobacco smoking including the use of e vaping devices in College Buildings and enclosed workplaces is prohibited.

It is College Policy to comply with the legislation on smoking and with legislation designed to protect the Safety, Health and Welfare of employees and others in the workplace. It is College policy to promote and facilitate good health among staff and students of the College. To this end all buildings and vehicles in the ownership or use of College are 'smoke-free' and smoking is prohibited within such buildings or vehicles, in enclosed entrances, porticos or tunnels and within a distance of 4m from entrance doors, opening windows and entrances to enclosed areas, tunnels or porticos. The Head of School or Unit Head is responsible for implementation of this policy in his/her area of responsibility.

Advice and assistance for smokers who would like to quit smoking is available from: The College Health Service, College Health Centre, Houses 47/52, College, Tel. 896 1556 and from The Student Counselling Service, 199 - 200 Pearse Street, Trinity College, Dublin 2. Entrance via College. Tel.: 8961407 Email: student-counselling@tcd.ie

Visitors

- Visitors to the Buildings associated with the Department must contact their staff host (or the Department office) immediately on entering the Building. Staff, who have visitors, are responsible for ensuring that their visitors are safe.
- Visitors who are not technically qualified must not be left unattended in any laboratory.
- Casual visitors to the Department should go to the Enquiries Office.
- Transition year school students who may be temporarily attached to the Department will be classified as visitors.

Disabled Persons

There are no fire lifts installed in the Mechanical Engineering Dept. **Available Lifts should NOT be used in the event of a Fire**. **Before entering the building Physically Disabled persons should be fully informed by their Host of the following procedures**.

Progressive Horizontal Evacuation or Lateral Evacuation will be practiced. Physically Disabled occupants will be moved horizontally within the building away from the hazard. A 'Buddy System' should apply whereby the staff member concerned will be responsible for the disabled Visitor/Student. Disabled Visitor(s)/Student(s) may be left behind for the arrival of the fire brigade to execute complete evacuation**. The staff member concerned must inform the fire service of the person's location.**

All visitors, contractors & maintenance personnel must comply with the Safety regulations.

Fire safety

The legislation governing fire safety in the Department is the Fire Services Act of 1981 and 2013, Building Control Regulations of 1997 and Building Regulations 1997 (Technical Guidance Document B – Fire Safety 2006).

When the fire alarm sounds all personnel must immediately leave the building using the nearest available exit route (or the exit route specified by local fire wardens). In the event of an emergency evacuation all personnel must obey, promptly, all instructions given by the Fire Warden/Safety Officer.

- Emergency exit routes are clearly indicated on all corridors.
- Escape routes are lit by emergency lighting in the event of failure of the electricity supply.
- Lifts must not be used during emergency evacuation.
- After evacuation go directly to the designated assembly point for your building. Do not congregate at the building entrance.

Fire drills

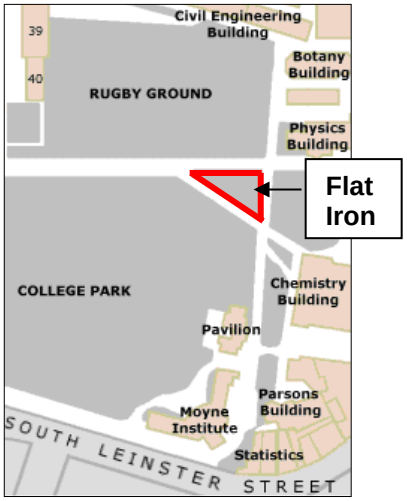
Fire drills are held twice during each calendar year and are attended by the College Fire Safety Officer and by members of the College Security Staff. Drills are held without prior warning and during working hours when the building occupancy is likely to be high. Security staff check each building for defaulters before the all clear is given. A written record of each fire drill is maintained, indicating the date, the approximate number of persons evacuated from the building, and the time taken for complete evacuation.

Fire wardens

The Fire wardens for the Mechanical Engineering Department as detailed in the section "*Health & Safety Personnel Contact Details*" above.

Fire Alarm and Evacuation Procedures

The Building is provided with an automatic fire alarm system, which is regularly tested by the College Buildings Office. The fire alarm can be manually triggered from any of the several break-glass alarm boxes, which are placed in strategic areas around the Building. In the event of a fire the fire alarm system should be activated immediately and the building evacuated. Persons in charge of lecture theatres and teaching labs should assist with the evacuation of their areas.



Assembly Point

The Parsons Building: Location D at the Flat Iron. It is that triangular section of grass which lies between the eastern ends of College park & the rugby pitch see map shown.

TBSI: Cumberland St / Sandwich St

Watt Building: Location E (between Lloyd and O'Reilly Buildings)

Trinity House: Location E

Firefighting Equipment

College appointed professional fire control companies carry out regular inspection, renewal and servicing of fire extinguishers under the direction of the College Estates and Facilities Office

Any person who has used one of the Building's fire extinguishers, even for a very short time, must report the fact immediately to the Departmental Safety Officer or Chief Technical Officer, so that it can be fully recharged or replaced. Additionally, an Accident/Incident Report Form must be completed in respect of each such use of any fire extinguisher.

Frivolous & unauthorised use of any fire-fighting equipment is a criminal offence

Action in the event of fire

If any member of the Department or the Trinity Centre for Biomedical Engineering discovers a fire the following actions must be taken. The person discovering the fire will:

- Provided that to do so does not compromise their personal safety, briefly attempt to extinguish the fire using the equipment provided.
- Activate the fire alarm,
- Leave the building and call for further help.

Liaison with the Fire Brigade

The Department & Trinity Centre for Biomedical Engineering recognises the special hazards, which its use of compressed gases presents to fire service personnel. The Department will seek to reduce these as follows:

- It will pursue, as far as is practicable, a policy of piping in gases rather than keeping gas cylinders on the premises.
- It will keep records of the main hazards relating to cylinders of compressed gases in each area of the building. A record of compressed gas cylinders in laboratories will be maintained by the Dept. Safety Officer and a copy will be kept at the fire panel located at the entrance to the building.

Fire Doors

Fire doors must not be left open under any circumstances.

First Aid

It is the policy of the Department that First Aid will not take the place of professional treatment. In the case of minor injuries such as cuts or burns, assistance may be sought from members of the Department who possess a qualification in First Aid. Those currently qualified in First-aid are shown in the Table on page one of this document.
For more serious injuries the person injured will be accompanied to the College Health Centre or an ambulance will be summoned.

First aid boxes

First aid boxes will be kept in appropriate locations. Names and telephone numbers of the nearest personnel with First Aid expertise are posted on all First Aid boxes, as is the College emergency number and that of the College Health Centre.
First aid boxes will be maintained by the Chief Technical Officer who will at regular intervals check that the contents of each box are in order and replace missing or outdated items.

The Department will carry a stock of commonly used First Aid materials which will be employed to replace items necessarily used. These will be available from the Chief Technical Officer.

First aid training

It is the policy of the Department to encourage volunteers from the permanent staff and postgraduate students to attend First Aid courses.

Hazardous Areas

Areas within the Building, which contain potentially hazardous equipment and/or substances, must be clearly marked with warning signs. Accessing to these areas is prohibited for unauthorised personnel.

Notices describing the hazards present in a laboratory are displayed on the exterior of its door. Before entering a laboratory, it is the duty of each person to acquaint themselves of the hazard/s present and to don the appropriate safety clothing or devices necessary for personal protection.

Working hours

The defined working hours for the Department and the Trinity Centre for Biomedical Engineering
Monday to Friday (8.30am - 10pm) and Saturdays & Sundays (10am-4pm)
All access doors will be locked outside 08.30-18.00hrs on weekdays and all day at weekends.

The only circumstances in which those other than staff members, postdoctoral workers, graduate & undergraduate students and accompanied visitors will be permitted to be in the Department outside the above hours are as follows:

i. Persons attending evening lectures.
ii. Persons attending society meetings.
iii. Security Staff.
iv. Cleaning Staff.
v. Maintenance Staff.
vi. Persons with special permission of the Head of Department.

Any student carrying out experimental or project work outside normal working hours must have prior permission from their supervisor.

Working in Isolation

Working on experimental systems (or machinery) outside normal working hours is not permitted without prior authorization of the project supervisor (or person-in-charge) after he/she has conducted a full assessment of risk and devised a safe system of work.
No staff member, postdoctoral worker or student will be permitted to carry out experimental or technical work of any kind in the Department at any time outside normal working hours unless there is another person close by, who is aware of their presence so that they can summon assistance in the event of an accident.

Isolated individuals must never carry out potentially hazardous work or activities.

Clearways

As far as is practically possible all entrances/exits, corridors, stairways and doorways must be kept clear of obstructions. All temporary obstructions (e.g. during movement of large equipment or maintenance work) should be notified to the Departmental Safety Officer who will designate alternative temporary emergency exit routes.

Electrical Switch Rooms/Plant Rooms

These rooms must always be kept clear of obstructions. Access to these areas must be kept clear.

Reporting of Hazards

All personnel using Departmental buildings have an individual responsibility to report, directly to the Departmental Safety Officer or Chief Technical Officer, all potential hazards and/or hazardous occurrences, which they may observe. Undergraduate students who observe hazard/s may report to their class representatives who in turn will report to the DSO.

Reporting Accidents, Incidents and Dangerous Occurrences

All accidents, incidents and dangerous occurrences, even those of a minor nature, must be immediately recorded and reported on the official University Accident Reporting Form (Appendix II). Details of witnesses to the accident/incident, if any, will also be noted if necessary. When completed, a copy of the form should be forwarded to the Departmental Safety Officer (for information and follow up action), the University Safety Officer (for information, and advice re: future prevention) and Estates & Facilities, West Chapel (for insurance purposes). A copy of the Accident/Incident form should be filed in the Departmental Accident Record Book held by the Chief Technical Officer.

If a member of staff is absent for greater than 3 working days as a result of an occupational accident or an occupational related illness, the Head of Department must specifically advise the University Safety Officer, as a separate mandatory report must be made to the Health and Safety Authority.

Section II - Safety rules for Teaching Labs & Lecture Theatres

The general safety rules and procedures, which apply to all personnel within Parsons building, including staff, students and visitors, are detailed in the GENERAL SAFETY RULES section of this document. The following rules apply specifically to all personnel (including staff, demonstrators, and undergraduate students) who are authorised to enter and work in the teaching laboratories and lecture theatres of the Department.

Training

As indicated previously, all teaching assistants, demonstrators and lab Technical Officers must have completed a Fire safety course. These courses are organized by College and details may be obtained from the Departmental Safety Officer.

General laboratory rules

- Incoming students must read and abide by the Health and Safety Guidance Manual issued by the Department of Mechanical & Manufacturing Engineering, TCD. A statement to this effect will be inserted into all MME student information booklets.
- Guidance for the use of hazardous equipment, materials and procedures (such as lasers, chemicals or electrical equipment for example) may be found in section 4 of this document (Safety rules for offices and research labs.)
- Coats, bags etc. must not be left on lab benches or anywhere they could cause an obstruction.
- Students are not allowed to work unsupervised without the explicit permission of the lab supervisor.
- Students should not congregate at the entrance to a laboratory or lecture theatre, or at building entrances.
- Students should be made familiar with these rules by the person in charge of the lab or lecture theatre.
- A Risk Assessment must be completed for each process (see Appendices for form)

Section III: Safety rules for Offices, Research Labs & Workshops

The general safety rules and procedures, which apply to all personnel within the buildings of the Department, including staff, students and visitors, are detailed in the GENERAL SAFETY RULES section of this document. The following rules apply specifically to all personnel (including staff, post-graduate research students, visiting researchers and undergraduate project students) who are authorised to enter and work in research laboratories (additional rules apply for Biomedical Engineering labs, within the Department.

Responsibility

Overall responsibility for health and safety within the Department rests with the Head of Department. Although at a local level the responsibility for ensuring a safe working environment and safe working practices in individual research laboratories rests with the individual research supervisor, or person in charge of the laboratory, all research workers have a responsibility not to endanger themselves and others by their actions or omissions.

Specialist safety consultants

In areas where specific identified hazards exist (lasers, chemical, electrical etc.), specialist safety consultants will be designated. These should be consulted prior to undertaking any work in these areas.

Authorised access to research laboratories

Access to each individual research laboratory is always strictly limited to those individuals authorised by the appropriate research supervisor or person in charge. In the case of visiting researchers and new staff the research supervisor is responsible for ensuring that the appropriate safety training is provided, if necessary, by specialist safety consultants, before laboratory access is authorised.

Laboratories which contain specific identified hazards (e.g., laser systems, hazardous substances etc.) must be clearly marked with warning signs. Access to such areas is strictly limited to authorised personnel with the appropriate training and expertise. For such areas prior authorisation must be obtained from the research supervisor before visitors or other unauthorised personnel are permitted to either enter the laboratory or undertake any work within the laboratory.

General Laboratory Practice

1) All researchers have a responsibility to maintain a tidy well organised and safe laboratory environment with a safe means of rapid access to and egress from all working areas. Access to all services (water valves, electrical fuse boxes/switches etc.) should always be kept clear.

2) All experimental systems should be designed to be fail-safe.

3) **All researchers should carry out a detailed assessment of the likely hazards and risks associated with their experimental systems and procedures. Research supervisors have a responsibility for ensuring that such systems and procedures meet the appropriate safety standards**.

Research supervisors must keep written records of risk assessments carried out (Appendix III) and provide, where necessary, appropriate written work instructions and additional written local safety rules. The essential steps that are taken in order to complete a risk assessment are as follows:

- Identify the hazards to health or safety arising from the activity or the workplace.
- Decide who might be harmed and how.
- Evaluate the risks and decide whether existing precautions are adequate or more needs to be done.
- Record your findings.
- Review your assessment and revise it if necessary.

A guidance document on the preparation of a risk assessment is available from the Departmental Safety Officer.

4) A copy of the risk assessment should be lodged with the Departmental Safety Officer. If in any doubt consult the appropriate safety consultant.

5) All researchers have a personal responsibility to make correct and full use of all protective clothing, personal protection equipment and safety aids provided in order to minimise risks.

6) Researchers must not attempt new procedures or tasks without consulting their supervisor and receiving appropriate safety training.

7) All researchers within a laboratory should be kept fully aware of day-to-day modifications carried out on experimental systems or operating procedures and clearly visible warning notices of any resulting potential hazard must be provided.

Unattended experiments/apparatus

Systems should not be left running unattended without consulting with the relevant research supervisor.
Where systems operate unattended for any period, an UNATTENDED APPARATUS form (Appendix IV) must be completed and clearly displayed beside the equipment. This notice must be removed when the condition no longer applies
When carrying out the risk assessment for such systems, special attention should be given to the effects of a loss of services (water, electricity etc.) on the safety of the system.

Computers & Visual Display Unit (VDU) Equipment

A booklet, outlining the correct use of VDU equipment, is available from the Departmental Safety Officer. Personnel using VDUs should consult this booklet.

Any users of VDU equipment who experience health problems, which they feel may be associated with their working environment or facilities, should contact the Student Health Centre for advice. If necessary, a full ergonomic risk assessment will be carried out.

Protective Clothing and Personal Protective Equipment

It is the policy of the Department that, where necessary, staff and students should be provided with protective clothing and personal protective equipment. Provision of protective clothing (lab coats, overalls, aprons, gloves) is the responsibility of the research supervisor.

Laser safety

The NSAI determines the regulations governing the safe use of lasers, these are defined in Irish Standard IS EN 60825-1:2014 (+AC:2017-06).
All members of staff and postgraduates who work with potentially hazardous laser equipment (Classes 3B or 4) must undertake the College 'Laser Safety Training course'. More details are available on https://www.tcd.ie/Physics/research/facilities/oal/laser-safety/.

Postgraduate workers must satisfy their supervisors that that they have taken the safety course and are competent to use laser equipment. Evidence of attendance shall be given to the Departmental Safety Officer. It is the responsibility of research supervisors to ensure all relevant safety precautions have been met.

Guide to Laser Classes

- Class 1: Incapable of producing damaging radiation levels, and thus exempt from beam-hazard control measures. Class 1M is potentially hazardous if viewed with collecting optics (e.g., telescope)

- Class 2: Usually safe for accidental exposure, but often handled with the aid of eye protection. Class 2M is potentially hazardous if viewed with collecting optics

- Class 3R (visible spectrum: $\leq$ 5 mW as continuous wave (CW) or $\leq$ 0.004 mJ pulsed): Potentially hazardous under certain viewing conditions and when the eye is properly focused and stable, but the probability of an actual injury is small, so they have reduced controls. Class 3R lasers will not pose either a fire hazard or diffuse reflection hazard, meaning that a change in the spatial distribution of a beam by scattering in various directions does not pose any significant threat

- Class 3B (visible spectrum: 5-500 mW as CW or 0.004-30 mJ pulsed): More hazardous and relatively unsafe under direct and specular reflection viewing conditions, even unfocused. A Class 3B laser product, however, is normally not a fire hazard, diffuse reflection hazard, or a laser generated air contaminant (LGAC) production hazard

- Class 4 (visible spectrum: >0.5 W as CW or >30 mJ pulsed): Most hazardous. Class 4 lasers are unsafe when a direct beam is exposed to the eye or skin. Furthermore, this laser can pose a fire hazard or diffuse reflection hazard, and it can also produce LGAC and even hazardous plasma radiation

Summary of precautions in use

Precautions and hazards	**Class 1 - 2**	**Class 3R**	**Class 3B**	**Class 4**
Safety training (see above)	Not required		**Required for operator & maintenance personnel**	
Remote lock	Not required		Connect to room or door circuits	
Key control	Not required		Remove key when not in use	
Beam attenuator	Not required		When in use prevents inadvertent exposure	
Emission Indicator	Not required		Indicates laser is 'ON'	
Warning signs	Not required		Follow precautions on signs	
Beam path	Terminate beam at end of useful length			
Eye protection	Not required		Required	
Protective clothing	Not required		Specific requirements may apply	
Specular reflection	No risk		Hazard to eyes	Hazard to eyes and skin
Diffuse reflection	No risk		Limited risk	Hazard to eyes and skin
Fire risk	No risk			Fire hazard with combustible materials

In the case of a laser Accident:

- Get immediate medical attention at the **Royal Victoria Eye & Ear Hospital**, Adelaide Road, Dublin 2, D02 XK51
- **Do not** use the laboratory or disturb the equipment until after an accident investigation has been performed.
- **Report all** laser accidents to the Discipline Safety Officer.

Chemical safety

Refer to pages 2 & 3 for safety consultation

The use of dangerous chemicals is strictly controlled by specific legislation, *Safety, Health & Welfare at Work (CHEMICAL AGENTS) Regulations, 2001*. The Regulations cover all chemical agents in the workplace. In particular it applies to chemicals, which are classed as very toxic, toxic, harmful, corrosive or irritant. In brief the Regulations require the Department:

a) To assess the health risks which arise from hazardous substances in the workplace and to identify and provide effective controls to protect people's health.

b) To ensure that the controls are properly used and maintained in effective working order.

c) To provide training and information for those who may be affected.

d) To monitor exposure and implement health surveillance where necessary.

A copy of the regulations is available from the Departmental Safety Officer. A code of practice for the legislation is also available.

The following rules and procedures apply for all work involving chemical agents within the Department.

1) Hazardous substances may not be ordered (or otherwise procured) before a suitable and sufficient risk assessment has been carried out.

2) **Hazardous substances or chemicals <u>may only be procured</u> through the Chief Technical Officer on foot of a signed requisition from the research supervisor**.

3) Chemical safety training is provided as necessary. No one may work with hazardous chemicals without having completed an appropriate College safety course or an equivalent.

4) All personnel using a particular chemical should read the manufacturer's Safety Data Sheet (SDS) for that chemical and a copy of the SDS should be retained.

5) A copy of Risk Assessments must be kept by PI and one lodged with the Departmental Safety officer.

6) All work involving chemicals should, as far as is reasonably practical, be carried out in a fume hood making full use of the safety goggles, safety clothing and other safety aids provided.

7) For work requiring use of a fume cupboard, users must at all times adhere strictly to the guidelines for correct fume cupboard usage.

8) Suitable bottle carriers must be used, when transporting Winchester, Quart and Euro-bottle containers of chemical substances, in order to prevent accidental spillages and personal injuries.

9) All stocks of chemicals or hazardous substances used in the Department must be properly stored in suitable chemical storage presses.

10) All chemicals or hazardous substances used in the Department must be clearly labelled including warning signs.

11) All chemical waste must be clearly labelled and disposed of promptly through College's Hazardous Materials Facility (HMF). Containers sent to the HMF should be no more than 2/3 full.
12) Solvent waste should be divided into chlorinated and non-chlorinated waste (and kept apart from acid waste!). Special safety-cans for solvent waste may be obtained from the HMF.
13) All broken glassware and other "Sharps" should be disposed of in the Sharps bins provided. Bins containing contaminated sharps should be labelled and disposed of via the HMF

Compressed gases safety

Safety consultation (Chief Technical Officer)

With compressed gases cylinder pressures may be as high as 300 bar and the gas or gas mixture may be flammable and/or toxic so great care must be exercised in their storage, handling and use. In addition, the use of some gases will also be subject to the Chemical Safety Rules given above.

Flammable or Explosive Gases constitute a hazard within the laboratory environment. Guidance for use of such gases is provided in ***CP8 - The Safe Storage of Gaseous Hydrogen in Seamless Cylinders & Similar Containers: 1986,*** produced by the British Compressed Gases Association. Such gases may be used only after appropriate local safety rules and procedures have been established by the research supervisor, in consultation with the College Safety Officer.

Such rules and procedures must be formally recorded and clearly displayed along with appropriate warning notices at all entrances to the designated work area.

The following safety rules apply for all compressed Gases.

1) All users of compressed gases must be fully familiar with the appropriate manufacturer's identification codes and cylinder configurations.
2) Only staff and students who have carried out the Gas Safety Awareness Training Course and have received their certification can connect/disconnect and move gas bottles
3) Never remove or deface cylinder identification.
4) Store cylinders vertically and clamp securely to prevent toppling. Cylinders must not be left free standing at any time.
5) Store in a well-ventilated area away from any fire risk.
6) Valves should be closed and valve outlets plugged or blanked. Valve guards or caps should be securely fitted.
7) Separate cylinders of flammable gases from those of oxygen or oxidants by at least 3m.
8) Cylinders may not be used in a laboratory except by permission of the Dept. Safety Officer. Only those cylinders, which are in current use, may be kept within the laboratory. Do not store cylinders in the laboratory.
9) Where possible pipe gases from a secure location outside the laboratory.
10) Ensure that you have read a current Safety Data Sheet (SDS) for each gas in use in your laboratory and that these are clearly displayed either on or adjacent to the cylinder.

11) A "Compressed gas cylinder in use" form (Appendix V), listing all the compressed gas cylinders currently in use must be displayed outside the entrance to all laboratories containing compressed gases. A compressed gases warning sign (Appendix V) must also be displayed.
12) In rooms where flammable or other hazardous gases are in use, appropriate signage must be displayed on the room entrances.
13) Always use the appropriate trolley to move heavy cylinders.
14) Only suitably equipped and trained personnel may move gas cylinders + fit regulators.
15) Gas cylinders should not be transported in occupied lifts.
16) Use only approved regulators. Check their suitability for the gas in use.
17) It is recommended that regulators are either replaced or refurbished after (at maximum) 5 years from date of purchase.
18) Before connecting the cylinder to your apparatus check the complete system for suitability particularly in terms of pressure rating and materials compatibility. All new pipe work should be inspected and leak tested by qualified personnel.
19) Never transfer gas from one cylinder to another.
20) Report all faulty cylinder valves and regulators immediately to the Chief Technical Officer.
21) Always close the main cylinder valve when a cylinder is not in use and ensure that an appropriate cylinder key is readily available for rapid shut down of cylinder output.
22) All compressed cylinder gases should be ordered through the Chief Technical Officer's office on foot of a signed requisition from the research supervisor.

The protocol for the use of gas cylinders and the necessary forms can be found in Appendix V of this document.

Empty Cylinders

Empty cylinders are not truly empty. They contain gas at atmospheric pressure. Thus, the cylinder still contains gas at a pressure of at least 1 bar. Depending on cylinder size, this can be a substantial quantity of toxic or flammable substance. It is important to ensure that gas containers are in a safe condition after use.

Before returning empty gas containers, a check should be carried out to ensure that:

- The cylinder valve is closed and not leaking.
- The cylinder valve outlet plug or cap nut, if supplied, has been securely refitted. This is particularly important if the contents of the container are toxic

More information can be found in the BOC booklet '***Safe Under Pressure'***.

Mechanical safety

Safety consultation (Chief Technical Officer)

The guarding of dangerous parts of machines & machine tools is a legal requirement (British Standard BS5304 - Safety of Machinery provides a guideline). All the equipment in our Engineering Workshop complies with the standard. However, machine tools are potentially the most hazardous pieces of equipment housed by the Department and great care must be exercised in their use. Local specific safety rules apply to technical staff normally working within the Mechanical Workshop and they have been trained in the use of the full range of workshop equipment. The following rules therefore apply only to research workers and students who enter the Mechanical Workshop.

1) Any person entering the workshop, while machining is in progress, should wear the safety glasses provided.
2) Persons entering the workshop must not directly approach anyone operating machinery but should wait until someone is available for consultation.
3) Only suitably qualified staff are permitted to operate the main workshop machinery.
4) Permission may be given, on an individual basis, for some under & post graduate members to operate a limited range of machinery. This is granted by the Chief Technical Officer if, and only if, he is satisfied that the person in question has adequate experience in the use of the machinery in question.
5) Physical movements within the workshops should be calm and unhurried in nature.
6) Long hair must be 'tied up', jewellery and loose clothing should be secured prior to using workshop equipment.
7) All reasonable commands given by members the Technical Staff should be obeyed.
8) All machines involving dangerous moving mechanical parts must be fitted with the appropriate safety guards/interlocks and should be inspected regularly by appropriately qualified staff.
9) Welding operations of any kind are to be carried out by technical staff only. Appropriate eye protection and gloves must be worn whilst welding. A clearance certificate must be obtained from the College Safety Officer before welding in any location other than the Mechanical workshop.

For those contemplating the use of our workshops further guidance may be found in the HSE book, "***Health and safety in engineering workshops".*** Berkley Library, official publications section. (OPUB GB HEAC 14E:6 or OPUB GB HEAC 14J:1)

Electrical safety

Refer to pages 2 & 3 for safety consultation

Due to the variety of electrical appliances within the Department electricity is a major hazard. Research supervisors and persons in charge of research laboratories have a responsibility to ensure that, new, or visiting research, staff have received appropriate training in electrical safety before authorisation of access to research areas and that good general working practices prevail within their research laboratory.

The following electrical safety rules will apply to all mains-powered equipment used in research laboratories.

1) Alteration of or maintenance to any part of a building's electrical services may only be carried out by staff of the College Buildings Office.
2) All new mains-powered electrical equipment must be inspected by suitably qualified personnel prior to installation.
3) Repair and servicing of mains-powered electrical/electronic equipment must be carried out by, or under the supervision of, qualified electrical/electronic technical staff.
4) All electronic circuitry constructed or modified within the laboratory and which will ultimately be either directly mains-powered or electrically coupled to mains-powered units must be tested by qualified technical staff prior to the mains power being switched on.
5) All research supervisors have a responsibility to carry out periodically, detailed assessment of risks associated with electrical equipment under their control and to ensure that all electrical equipment is tested and maintained on an appropriate and regular basis.
6) Hazardous mains-powered equipment undergoing modification or test must not be left powered and unattended without consultation with the responsible member of the technical staff.
7) Areas containing equipment capable of generating high voltages, which may on occasion be exposed, must display warning signs on the entrance doors.
8) Experiments involving electrical equipment, which operate overnight must be designed to be inherently failsafe and capable of safe shut down via the mains isolation switch.
9) The use of rotary transformers without suitable ELCB protection is expressly forbidden
10) Mains cables and plugs should be regularly inspected. Faulty cables are to be replaced immediately.
11) Extension cables and sockets must not be left on the ground. If this cannot be avoided the cable/s must be housed in a ‘safety cable cover’.

Visual Display Unit (VDU) Safety Assessment

Implementation of the Regulations on Computer Usage

The Safety, Health and Welfare at Work, (General Application) Regulations 2007, Chapter 5 of Part 2 outline the requirements that must be adhered to in relation to Display Screen Equipment.

Under Safety Health and Welfare at Work (General Application) Regulations 2007, all persons working with Visual Display Units (VDUs or Computer Monitors), should have their workstation assessed to ensure that any potential hazards related to poor ergonomics, unsatisfactory seating, poor lighting or glare etc. can be identified and rectified at an early stage.

Department requirements

In order that such workstation assessments can be undertaken in practice, the department is obliged to have one person in their area trained as a VDU assessor (see Table page 1) who will then be competent to undertake these VDU workstation assessments in their work area

- **The Screen**: Characters and Image well defined no flickering, adjustable brightness and contrast, no reflective glare.

- **Keyboard:** Sufficient resting space for hands and forearms, it must rest on a matt surface, it must be detachable and it must positioned such that the elbow angle is between 70-90 degrees, the symbols legible.

- **Seating:** Chairs should be stable and allow freedom of movement; it should have adjustable height and have a backrest which is adjustable in height and tilt, it should have casters. Feet should rest on the floor, or a floor rest should be provided.

- **Environment:** There should be sufficient space to change position & vary movement. Lighting should be sufficient the ambient light should be 300/500 lux, and if required have florescent light diffusers fitted. There should be no glare or reflection from the screen or surface of the desk. The VDU should not be positioned facing a window with the light facing the user or backing onto a window such that the sunlight reflects off the screen, it should be positioned side-on where possible. In the event that the position of the VDU cannot be changed blinds (vertical type is recommended) should be provided where needed. In relation to radiation; WHO advises that levels of radiation from VDU's do not pose significant risk to health, most radiation emitted from VDU's occurs from the side of the unit. Therefore, it is recommended not to position a VDU such that it is located side on to another user.

- **Employees:** Employees are required to take a break within the hour of starting work using a VDU and each hour thereafter. Preferable before the hour has lapsed. They are advised to move away from the VDU for a period.

- **Eyesight testing:** Eye tests should be undertaken before users commence using a VDU. Any local Optician can be used, to have the eye test. The cost of the eye test can be recovered from the department provided that prior notice is given of the eye test. If the employee has social welfare (PRSI) eligibility to an eye test this must be claimed before making any claim on Department/College. Ideally such tests should be undertaken at regular intervals. In the event that a large number of staff need to be catered for this can be accommodated

through the Student health services who will make arrangements with an optician. If an employee already wears glasses and routine changes of lens are needed, “if these glasses are adequate also for VDU work, then the Department is not liable for the cost”. Claims costs for should be submitted in advance with a copy of the prescription to the Head of Discipline who may then seek verification of the prescription from the College Occupation Health Service provider. A link to the college website is:

https://www.tcd.ie/estatesandfacilities/health-and-safety/Office-Safety/

- **Further Information:** For further information of all these issues the College safe Working with VDU’s web site can be accessed at the following link http://www.tcd.ie/hr/assets/pdf/Visual_Display_Units.pdf

Note: Laptops are not covered under these regulations. Where laptops are used, they should have docking stations where the keyboard is detachable. If by the owner’s choice they wish to use a laptop they must sign off on its use.

APPENDICES

Appendix I - The Smoking Initiative

University of Dublin, Trinity College (College Safety Officer)

University of Dublin
Trinity College

SMOKING IN COLLEGE

Approved by Board
Nov 2011

1. PURPOSE

To state College policy regarding smoking in College.

2. SCOPE

Under the Tobacco Smoking (Prohibition) Regulations, 2003, tobacco smoking in College buildings and enclosed workplaces is prohibited with the exception of bedrooms in College Residences.

3. POLICY

It is the policy of the Provost, Fellows and Scholars of the University of Dublin, Trinity College to comply with the legislation on smoking and with legislation designed to protect the Safety, Health and Welfare of employees and others in the workplace. It is College policy to promote and facilitate good health among staff and students of the College. To this end all buildings and vehicles in the ownership or use of College are 'smoke-free' and smoking is prohibited within such buildings or vehicles in enclosed entrances, porticos or tunnels and within a distance of 4m from entrance doors, opening windows and entrances to enclosed areas, tunnels or porticos.

The Head of School or Unit Head is responsible for implementation of this policy in his/her area of responsibility. The Head of Building is responsible for implementation in common areas in multi-user buildings. If the Head of Building or Head of School/Unit is unable to satisfactorily resolve any issue covered by this policy the issue may be referred to the appropriate Senior Officer - the Faculty Dean or Senior Dean in the case of academic staff, the Junior Dean in the case of students and the Chief Operating Officer in the case of non-academic staff.

Advice and assistance for smokers who would like to quit smoking is available from: The College Health Service, College Health Centre, Houses 47/52, College, Tel. 896 1556 and

from the Student Counselling Service, 199-200 Pearse Street, Trinity College, Dublin 2. Entrance via College. Tel.: 8961407 Email: student-counselling@tcd.ie

The College Safety Committee will review this policy with changes in the Legislation and will consider the experience of Departments in implementing this policy. The College Safety Committee will welcome comments and submissions on the Smoking Policy

Appendix II - Accident/Incident Report Form

ACCIDENT/INCIDENT REPORT FORM

This form must be completed by the School/Department Head, Chief Technical Officer, or School/Unit Safety Officer as soon as possible after any incident has occurred. This is a requirement under the College's Employer & Public Liability policies. In the case of personal injuries, the original form should be retained by the Department, and copies sent to Estates and Facilities Department, 194 Pearse Street, College or email to estatesandfacilities@tcd.ie

Name: …….. **Staff** ☐ **Student** ☐ **Other** ☐

Department: ……..

Job Title: …… **Hours of Work:** ……..

Date & Time of Alleged Accident: ……..

Place/Building Name: ……..

Grade of Accident: **Minor** ☐ **Moderate** ☐ **Severe** ☐

Brief Particulars: ……
(Continue overleaf if necessary)

Nature of Injury: ……
(If to limb or eye, state whether left or right)
……..

What action was taken to treat or minimize injury or damage?
……

In cases or moderate or severe accidents please state the names & addresses of any witnesses:

(1) ……...
(2) ……...

Are you satisfied that an accident occurred at the time, date and place stated?
Yes ☐ **No** ☐

Was the person authorized to be in that place at that time for the purpose of his/her work?
Yes ☐ **No** ☐

What was the person doing at the time of the accident?
……..

Was this something authorized or permitted to be done for the purpose of his/her work?

Yes ☐ No ☐

To whom was the accident reported? ……

When was it first reported? ……..

Signed: …….. Date: ……

*Minor = Onsite treatment; Moderate = First aid and referred for medical attention; Severe = Ambulance called.

Print Name: …… Ext No: ……

Appendix III - Risk assessment form

Guidance notes on completing the risk assessment form

Hazards

- Only list those hazards that you could reasonably expect to cause significant injuries or affect several people. (identification of hazards for guidance)
- Will the work require the use of machines and tools? How can you or anyone else be injured?
- Will the work require the use of chemicals? If so, check safety data sheets for harmful effects and any exposure limits.
- Will the work produce any fumes, vapours, dust or particles? Can they cause significant harm?
- Are there any significant hazards due to where the work is to be done, such as confined space, at height, poor lighting, high/low temperature?
- Specific hazards should be assessed on a separate risk assessment form and cross-referenced with this document (e.g. compressed gases, Cryogens, etc.)

Who might be exposed:

- Include yourself, your supervisor, others working in or passing through the work area.
- Those more vulnerable or less experienced should be highlighted as they will be more at risk, such as people unfamiliar with the work area, disabled or with medical conditions, e.g. Asthma.

Existing control measures:

- List the control measures in place for each of the significant hazards, such as machine guards, ventilation system, use of Personal Protective Equipment (PPE), generic safety method statement/procedure.
- Remember appropriate training is a control measure and should be listed.
- List any Permits to Work, which may be in force. (e.g. Hot work permits)

Are risks adequately controlled?

- With all the existing control measures in place, do any of the significant hazards still have a potential to cause significant harm.
- Use your judgement as to how the work is to be done, by whom and where.

Additional controls:

- List the additional control measures, for each of the significant hazards, which are required to reduce the risk to the lowest so far as is reasonably practicable.
- Additional measures may include such things as: increased ventilation, Permit to Work, confined space entry permit, barriers, etc.

The Identification of Hazards (non-exhaustive)

- Fire
- Fall of persons or of objects/material from height or same level
- Chemicals: - toxic irritant corrosive flammable explosive or oxidising substances
- Contractors on site/in departments
- Manual handling
- Use of VDU's
- Use of hazardous machinery
- Carcinogens, teratogens or mutagens
- Electricity (including static)
- Poor housekeeping standards
- Waste disposal
- Explosions: - chemical, dust, bomb or incendiary
- Arson
- Compressed gases
- Mechanical lifting operations
- Noise and vibration
- Biologically hazardous agents
- Physically hazardous agents
- Ionising and non-ionising radiation
- Use of hand and power tools
- Stored energy
- High pressure machinery or containers
- Lighting heating and ventilation
- Confined spaces
- Cleaning operations
- Unguarded machinery
- Unsafe work practices
- Visitors on site/ in Department
- Foreign visitors/students
- Disabled students/visitors
- Acute/ chronic effects of long-term exposure to chemicals
- Staff and student placement/outside work experience
- Dusts fumes particulates and aerosols
- Allergens
- Environmental contamination/pollution
- Lack of emergency procedures
- New equipment plant or work practices
- Injury to third party or non-College staff
- Maintenance and repairs to hazardous machinery or areas
- Lack of personal protective equipment
- Contact with moving objects or impact injuries
- Hazardous by products of experiments or projects
- Late night, solo, or unsupervised working
- Contact with hot /cold surfaces or substances
- Bullying and Harassment
- Stress

Department of Mechanical & Manufacturing Engineering
Trinity College Dublin
Project Risk Assessment Form

Student Name	
Student Number	
Student Category (BAI, BSC, MAI, MSc, PhD or Visitor)	
Year of Course	
Project Title and Reference	
Start Date of Project	
Building Location of Project Work	
Room number	
Supervisors name	

Project Details

Give a brief description of the work to be undertaken and the procedures used.

Sample Hazards/Risks		L		M		H	
		L		M		H	
		L		M		H	
		L		M		H	
		L		M		H	
		L		M		H	
		L		M		H	
		L		M		H	
		L		M		H	

Personnel Exposed:		Number of personal exposed	

Existing control measures	

Are Risks adequately controlled Yes No

If NO, list additional controls & actions required	**additional controls**	**action by:**

Completed by:	Name:	Signature:	Date

Supervisor:	Name:		Signature:		Date
Date of reviews:					

A copy of this form must be lodged with the Departmental Safety Officer (dsimpson@tcd.ie)

Appendix IV - Unattended Apparatus

Please Leave Running.

Location: ……..

Type of Apparatus	

Services used	**Electricity**	**Water**	**3 Phase Power**	**Compressed gases**	**In room**	
					yes	**no**

Special Hazards	

To Shut down in an emergency

Contacts			
Name			
Telephone #			

NB: Equipment should only be left running when absolutely necessary.

INSTRUCTIONS FOR COMPLETING THIS NOTICE

If unattended equipment is left running, a completed copy of this notice must be left on the outside of the main doorway of the workroom/lab. In certain circumstances, it may be prudent to attach an additional copy of this notice to the equipment concerned.

When completing this notice please:

1) Print clearly.

2) Define the item of equipment to which the notice refers in a clear manner, for example 'Vacuum rig A' referring to a vacuum system with the letter 'A' boldly displayed on it. If necessary, define the location of the machine to avoid confusion.

3) Tick the appropriate boxes to indicate the service/s being used and name the cylinder gases/piped gases (if any). If a gas cylinder is used rather than piped gas, check the appropriate box.

4) Provide information relating to any special hazards, such as high temperature, high voltage etc., in the 'Hazards' section.

5) State the emergency shutdown procedure in an ordered sequence,
   For example:
   - CLOSE VALVE 'A'
   - OPEN VALVE 'B'
   - ISOLATE MAINS ELECTRICAL SUPPLY AT SOCKET 'C'
   - TURN OFF COOLING WATER AT TAP 'D'

   Ensure you clearly label the named valves, sockets, etc.

6) State your name, home address and telephone number and include details of an alternate who is reasonably familiar with the equipment in the 'Now contact' section.

Remove this notice from display when the equipment is no longer running.

Appendix V - Gas Cylinders Safety

Use of Gas cylinders in the Department of Mechanical & Manufacturing Engineering TCD.

Before beginning any experiment requiring the use of a compressed/liquefied gas that must necessarily be imported into a laboratory within a cylinder a **Risk Assessment form** (Appendix III) and a **Compressed Gas Permit** (see below) must both be completed & countersigned by the relevant supervisor and the Departmental Safety Officer. The Departmental Safety Officer shall retain a file copy of each such Permit Form.
Copies of the Compressed Gas Permit form must be exhibited on the outer door/s of the laboratory in question during the period of use of the cylinder & shall be removed once the experiment is completed. The gas cylinder in question is then removed from the interior of the building. Additionally, a **Gas In Use** notice stating the name of the gas being used and showing 24-hour contact details for each of the researcher, his/her supervisor and the relevant Departmental Safety Officer shall be affixed to all doors opening into the laboratory (see notice below).
An additional copy of the Compressed Gas Permit form shall be displayed beside the fire safety panel at the principal entrance to Parsons building (in a location known to the Fire Brigade). This notice shall only be removed once the experiment has been completed and the gas cylinder in question has been removed from the interior of the building.

1. All such gases shall be contained in approved cylinders of appropriate structural quality which are fitted with approved regulator valves suitable for the pressures involved.
2. All regulators, hoses and fittings must only be fitted/replaced by trained technical staff through instructions from the Chief Technical Officer.
3. Gas cylinders which are brought into laboratories shall, as far as is practicable, be of the minimum size and capacity consistent with the experimental work which is to be carried out.
4. Gas cylinders shall be moved into and out of the building using a properly constructed trolley or other appropriate means by trained personnel only.
5. When used in laboratories gas cylinders shall be properly secured by an approved restraint system.
6. Experiments requiring the use of special gases shall generally be conducted in such a manner that the point-of-use of the gas is within an approved fume hood.
7. Cylinders containing toxic, flammable and pyrophoric gases with a NFPA rating system number of 3 or more may not be used within the building.
8. Flexible or other hoses used to deliver gas from a regulator outlet to the point-of-use must be of appropriate material and shall be securely attached to flanges, spigots, etc. in a gas-tight manner.
9. Experimental work must be scheduled in such a manner that the need to keep gas cylinders in laboratories overnight or at weekends is minimised.
10. The copy Compressed Gas Permit forms located on the doors of the relevant laboratory and at the relevant reception desk shall be retrieved and destroyed immediately after the experiment has been completed and the gas cylinder(s) have been removed from the interior of the building.
11. On the expiry of a Compressed Gas Permit the Department Safety Officer shall confirm that the gas container has been removed and notices withdrawn.

CAUTION!

Compressed gas cylinder in use

Location:

.....

Gas types:

.....

Hazards: (toxic, flammable etc.).....

.....

.....

IN CASE OF EMERGENCY CONTACT

Name:..... **Tel:**.....

Name:..... **Tel:**.....

Name:..... **Tel:**.....

Department of Mechanical & Manufacturing Engineering

Compressed Gas Permit Form

This form must be completed and countersigned by the research supervisor and the Departmental Safety Officer before the commencement of any experiment which of necessity requires the use of a cylinder/s of compressed gas within any laboratory in the Department's buildings.
Your attention is drawn to the foregoing mandatory conditions relating to the use of cylinders of compressed gases within laboratories.

What gas do you propose to use? (CO, NH3, H2C=CH2, etc.)	
Where do you propose to use this gas? (Building + Room number)	
When will your experiment (a) start (date + time) (b) Finish (date + time)	

Provide an outline of your experimental set-up:

DO NOT FORGET TO COMPLETE THE NORMAL RISK ASSESSMENT FORM & ATTACH A COPY TO THIS DOCUMENT

Signatures:

Researcher:…….....**Date:**…….....

Supervisor:
…….....**Date**:…….....

Safety Officer:…….....**Date:**…….....

N.B.
A COPY OF THIS COMPLETED FORM MUST BE SENT TO THE COLLEGE SAFETY OFFICER.

Appendix VI - Radiological Safety Code for the Use of Sources of Ionising Radiation.

Radiological Safety

The College Safety Office site contains most of the information you will need to be aware of if you are working with or intend to work with radioactive materials (RAM) or irradiating apparatus in the university. See the link below for the most recent information regarding Radiological Safety in TCD

https://www.tcd.ie/estatesandfacilities/health-and-safety/Lab-Safety/radiological-safety/index.php

****

(Revised June 2004)

1. This code applies to all departments using radioactive isotopes or X-ray apparatus for any purpose unless exempted under section 2 below.
Its requirements are additional to those imposed in the licence granted to the College by the EPA-ORP (Environmental Protection Agency – Office of Radiological Protection).
This code is specifically cited in the schedules to the licence.

2. The code does not apply in the following cases: -

(a) X-ray equipment that is incapable of operating above 30kV, provided the dose rate does not exceed 1 microsievert per hour at any point situated 0.1 m from any accessible part of the surface.

(b) Any radioactive substances, where:

(1) the quantities involved do not exceed in total the exemption values set out in column 2 of Table A to Annex 1 of The Radiological Protection Act 1991 S.I. No. 125 of 2000.

Or

(2) the concentrations of radioactivity per unit mass do not exceed the exemption values set out in column 3 of Table A to Annex 1 of S.I. No. 125 of 2000.

(c) Any other substances or apparatus exempted under Article 4 of S.I. No. 125 of 2000

3. Formal control of sources of ionising radiation in all College departments shall be exercised by the Radiological Protection Officer (RPO) and the College Radiological Safety Committee. All research projects making use of sources of ionising radiation must have the approval of the RPO in some cases, where the RPO deems it necessary, may also

need approval of the University Radiological Safety Committee. Such approval must be obtained at the planning stage of the project. Any significant changes to the project which may affect radiological protection measures in place, must also be notified to and approved by the RPO.

4. Individual heads of departments are responsible for the safe use of sources of ionising radiation within their departments.

5. Each head of a department where a source or sources of ionising radiation are used shall nominate, for approval by the College Radiological Safety Committee, one member of the departmental staff who will be responsible for the keeping of records and the day to day management of radiological safety issues within the department. This individual will be known as the Departmental Radiological Protection Supervisor (DRPS) The DRPS plays a supervisory role in assisting College to comply with the requirements of the legislation and in ensuring compliance with College Radiation Safety Procedures (local rules) and best practice procedures.

Work with sources of ionising radiation may not be carried out in any department without the written permission of the Departmental Radiological Protection Supervisor in the first instance. Working with ionising radiation in College is on a permit to work basis. Only authorised personnel are entitled to work with ionising radiation. Any persons intending to work with radioactive materials (RAM), whether these are sealed or unsealed sources, or with irradiating apparatus, must first register with their Departmental Radiological Protection Supervisor and complete a registration form (Rad1, Rad2, or Rad3) to seek permission to use ionising radiation in College. The Departmental Radiological Protection Supervisor is authorised to refuse permission to undertake work with ionising radiation in the department if s/he is not satisfied that the necessary safety requirements are met. The Departmental Radiological Protection Supervisor is also authorised to require that a work activity with ionising radiation, which he/ she deems to be unsafe, or in contravention of the College licence requirements, or in contravention of the College Radiation Safety Procedures, cease or be suspended until appropriate control measures are implemented. The Departmental Radiological Protection Supervisor should, where possible, consult with the College Radiological Protection Officer (RPO) before taking such action, but may, in the event of an emergency for instance, or where consultation with the RPO is not possible, make such a decision without consultation.

Note: By law, 'the undertaking', i.e. the College, heads of individual departments and each individual person working with sources of ionising radiation carries ultimate responsibility for compliance with radiation legislation. This responsibility cannot be delegated to the DRPS nor to the RPO.

Each individual in College working with ionising radiation is legally responsible for taking all due care for their own health and safety and the health and safety of anyone who may be affected by their work activities. All radiation workers in College are obliged to familiarise themselves with and to comply with the conditions of the College licence, and this Radiological Safety Code for the Use of Sources of Ionising

Radiation. All radiation workers in College are obliged to consult with their DRPS before undertaking any work with ionising radiation, and as necessary during the course of their work. All radiation workers in College are obliged to co-operate with their DRPS in complying with the provisions of this Radiological Safety Code and are obliged to comply with any recommendations or advice given by the DRPS.

.

6. Overall supervision and advice on radiological safety is the responsibility of the College Radiological Protection Officer (RPO).
The College Radiological Protection Officer is Dr Gillian Gunning. Phone 8962887, E-Mail gillian.gunning@tcd.ie
The Radiological Protection Officer must be consulted on certain issues but the ultimate responsibility for radiation safety in College rests with the College & with individuals within College departments who are working with radiation.

The Radiological Protection Officer must be consulted with in relation to the following matters;

a) The examination and testing of protective devices and measuring instruments.

b) The prior critical examination of plans for installations from the point of view of radiation protection.

c) The acceptance into service of new or modified sources from the point of view of radiation protection.

d) The regular checking of the effectiveness of protective devices and techniques.

e) The regular calibration of measuring instruments, & the regular checking that they are serviceable & correctly used.

7. All persons working in areas where dose rates exceed the values given in section 2a or where there are radioactive sources of greater activities / concentrations than the values given in section 2b should be issued with a copy of this code by their departmental radiological protection supervisor (DRPS). The DRPS should be satisfied as to the competence of each such individual for the operations to will carry out.

8. If a possibility of exposure to significant levels (i.e., greater than 1 mSv. year $^{-1}$) of penetrating radiation exists, the DRPS will arrange for the issue of personal dosimeters to each person who may be exposed. The DRPS will ensure that a record is kept of the exposures recorded by such personal dosimeters. Such records must be kept indefinitely. A dosimeter must never be used by more than one person.

9. A record will be kept by each department of the quantity and nature of each radionuclide present in the department. This record will also give details of the usage and disposal of the radionuclide.

10. Each room in which radioactive materials or radiation sources are stored or used will have the internationally agreed black and yellow symbol for radiation prominently displayed at the entrance to the room. A list of safety rules must be permanently mounted in a conspicuous position within the room.

11. The Departmental Radiological Protection Supervisor must approve the ordering of all sources of ionising radiation at departmental level, whether sealed, unsealed or new irradiating apparatus and must officially sign off order forms. These safety procedures prevent radioactive sources or radio-chemicals, not on the College licence, entering College they also ensure that the quantities of materials ordered are within specified limits on our licence. These procedures also prevent unauthorised personnel from ordering &/or working with radioactive materials. The ordering of sources of ionising radiation by e-mail is prohibited.

12. All licensed radioactive sources shall be shielded, packaged & transported in accordance with the International Atomic Energy Agency's Regulations for the safe transport of radioactive material, & in accordance with the conditions outlined in the College licence.
The DRPS will ensure that users of radionuclides understand the international transport labels affixed to the packages in which isotopes are delivered & the relative hazards which are indicated by such labelling, so that appropriate precautions can be taken. Please note that College is not licensed to transport radioactive substances.

13. The DRPS must be informed quickly of all spills or other accidents involving radioactive materials. The College Radiological Protection Officer must also be informed if the possibility of contamination or external exposure of workers or other persons exists.

14. In the event of an emergency, the Departmental Radiological Protection Supervisor should be contacted immediately at the phone numbers outlined above to give advice & guidance on procedures to be followed. If the DRPS is not immediately available, the College RPO should be contacted at the number given or on the following mobile phone number: 086-6023160 (emergencies only). The College security centre should also be contacted at ext. 1999 & advised of the situation. If the emergency services need to be contacted such as the fire brigade or ambulance, these should be contacted through the College security staff who can open gates for them and direct them into the appropriate area of College etc.
Examples of emergency situations would include fire or explosion in a building / room containing radioactive materials, loss or theft of any licensed item, damage to, leakage from or other incident / accident involving a licensed item. In the event of an emergency, the EPA-ORP should also be contacted and notified at 01-2680100. They can also offer advice and guidance.
Each radiation worker must familiarise themselves with individual departmental emergency procedures and must discuss this matter, and their role in implementing departmental emergency procedures with their departmental radiological protection supervisor before commencing work with sources of ionising radiation.
More detailed emergency procedures are outlined in the College document entitled 'College Radiation Emergency Procedures'. All users of ionising radiation in College should be familiar with these procedures.

15. The Departmental Radiological Protection Supervisor will arrange for the disposal of solid radioactive waste from laboratories using radioactive materials at regular intervals & in accordance with the requirements of the EPA-ORP. Such waste should be stored in

appropriate containers under cover in a vermin free environment until collection for disposal is arranged. When disposing of waste, you must comply with the following procedures

16. The College Radiological Protection Officer will inspect each department's records at intervals and will advise on any other precautions that may from time to time be required.

17. The RPO may report to the College Radiological Safety Committee any department failing to comply with the safety rules relating to radiological protection. The Committee may invoke disciplinary procedures, which may include the suspension of work with ionising radiation.

18. All procedures involving the importation, transportation, custody & use of radionuclides & the disposal of associated waste are licensed by the EPA-ORP & these procedures are subject to their inspection. License applications are made by the Departmental Radiological Protection Supervisor, through the College Radiological Protection Officer, who submits them to the College Radiological Safety Committee and the EPA-ORP for approval. The EPA-ORP will rigorously investigate any areas of non-compliance with license conditions and they have the power to revoke or suspend the College license.

Appendix VII - Display Screen Equipment Risk Assessment Form

Under the Safety Health and Welfare at Work Act (General Application) Regulations, 1993, all hazards associated with the use of display screen equipment (VDUs) must be identified, and any risk to the health and /or safety of the user must be assessed.
To ensure compliance with this legislation, the following checklist must be completed for all VDU workstations in your department.

1. Display Screen
Yes No
(a) Are the Display Characters easy to read? □ □
(b) Are the Display Characters of adequate size? □ □
(c) Is the image stable and free from flickering? □ □
(d) Are there controls for brightness and contrast? □ □
(e) Can the screen be tilted and swivelled easily? □ □
(f) Is it possible / necessary to adjust the height of the screen? □ □
(g) Is the screen free from uncomfortable glare and reflection? □ □

2. Keyboard
Yes No
(a) Is there enough space in front of the keyboard for one to rest the wrists and arms? □ □
(b) Is the layout of the keyboard easy to use? □ □
(c) Are the keyboard symbols easy to read? □ □
(d) Is the keyboard non-reflective? □ □
(e) Is the keyboard detachable? □ □

3. Work Desk
Yes No
(a) Does the surface have low reflection? □ □
(b) Is it large enough for all equipment? □ □
(c) If a document holder is provided, is it stable, adjustable, and at the same level as the display screen? □ □
(d) Is work positioned to lessen head /eye movements? □ □
(e) Is there enough space for employees to find a comfortable position? □ □
(f) Are any electrical cables / equipment in good condition? □ □
(g) Are cables tidy and prevented from trailing? □ □
(h) Is adequate storage space for documentation etc. provided in/on the desk? □ □

4. Work Chair
Yes No
(a) Is the work chair stable? □ □
(b) Does the chair allow operator easy freedom of movement? □ □
(c) Is the seat height of the chair adjustable? □ □
(d) Is the backrest of the chair adjustable in height and tilt? □ □
(e) Can the angle of tilt of the backrest be locked into a suitable position? □ □
(f) Is the user aware of how to adjust the chair properly in order to find the best sitting posture? □ □
(g) Can the user place both feet flat on the floor? □ □
If not - Is there a stable footrest available for use? □ □

5. Work Environment

Yes No

(a) Is there enough space for user to change position & vary movement? □ □

(b) Is lighting adequate for the task with no extremely light or dark areas? □ □

(c) Can the workstation be adjusted to avoid glare and reflections? □ □

(d) Do windows have adjustable blinds or other suitable adjustable coverings? □ □

(e) Is the VDU positioned so that neither the screen nor the operator are facing a window? □ □

(f) Is the working area free from excessive noise from equipment? □ □

(g) Is the room temperature comfortable? □ □

(h) Is the humidity level comfortable? □ □

(i) Is the ventilation adequate? □ □

6. Operator / Computer Interface

Yes No

Does the operator find the software easy to use and non-stressful? □ □

7. General

Yes No

(a) Has an eye & eyesight test been made available to the user? □ □

(b) Has the user had an eye and eyesight test in connection with the use of VDU's? □ □

(c) Has a system of permitted breaks been set up? □ □

(d) Is the user free from fatigue or stress? □ □

(e) Is the user free from aches, pains, pins and needles etc. in the neck, back, shoulders or upper arms? □ □

(f) Is the user free from restricted joint movement? □ □

(g) Is the user free from problems with vision – headaches, sore eyes, problems with focusing etc.? □ □

Overall Assessment

What, if any remedial action is required?

_____

_____

_____

Please notify the responsible person for implementation, i.e. Head of Discipline.

Assessor's Signature: VDU operator's signature:

Department:

_____

Date of Assessment: _____Location: _____

A copy of this completed Risk Assessment Checklist should be kept with the relevant Departmental Safety Statement.

Appendix VIII - Basic Health Assessment for Field or Laboratory Work

In a very small number of cases, the ability of an individual to undertake field or laboratory work may be compromised by pregnancy or an existing medical condition. In such cases, specific control measures such as enhanced supervision may have to be introduced to allow the person to perform the work safely. In order to assess these needs, and to ensure the College fulfils its legal Health and Safety obligations, it is necessary to ascertain any conditions which may seriously affect any individual during field- or laboratory-work.

You are, therefore, asked to look at the attached questionnaire (next page). ***If you respond with a yes to any of the conditions, you are asked to contact the Physician in the Medical Centre (House No. 47, Tel. 896 1556). The doctor will advise you if any precautions are necessary for the type of work you are to*** undertake.

The doctor is bound by his/her professional code of conduct which precludes him/her from divulging any personal details. Hence, all information will be treated in strict confidence.

I have read the attached health questionnaire and would confirm the following:

……

……

……

Name: ..... (BLOCK CAPS);

Faculty: …….....

Signed: ..... Student/Staff ID: .....

Dated: .....

THIS DECLARATION SHOULD BE SIGNED AND HANDED BACK TO THE DEPARTMENTAL SAFETY OFFICER.
INFORMATION GIVEN IN THE QUESTIONNAIRE ON THE FOLLOWING PAGE SHOULD ONLY BE GIVEN TO THE STUDENT HEALTH OFFICE.

IF YOUR HEALTH STATUS CHANGES AT ANY STAGE DURING YOUR TIME IN COLLEGE WE WOULD ADVISE THAT YOU SEEK ADVICE INITIALLY FROM THE STUDENT HEALTH OFFICE.

Confidential Health Questionnaire

Name: ……Date of Birth: .....

Male / Female: …… Next of Kin: ……

Contact number: …….....

Address.....

Do you suffer, or have you suffered in the past, from any of the following?

MEDICAL CONDITION	**YES/NO**	**DETAILS**
Asthma bronchitis or other lung problem		
Heart disease		
Fits or fainting episodes?		
Mental illness or depression		
Rheumatic fever		
Rheumatism or arthritis		
Stomach or duodenal ulcers		
Liver disease		
Kidney disease or urinary infections		
Diabetes		
Back trouble		
Skin disease		
Blood disorders		
Recurrent headaches or migraine		
Allergies		
Vision defects (other than correctable by lenses)		
Ear problems or hearing difficulties		
Injury from past accidents		
Major surgical operations		
Do you suffer from any other disabilities?		
Are you taking any prescribed medication? (other than contraceptive pill)		
Are you taking other substances or drugs		
Are you a smoker? 1-10; 11-20; 20+/day		
WOMEN Are you pregnant? Lactating?		
Any other gynaecological issues?		

IF YOU ANSWER YES TO ANY ONE OF THESE QUESTIONS, OR IF YOUR HEALTH STATUS CHANGES UNDER ANY OF THESE HEADINGS DURING YOUR PERIOD IN COLLEGE, THEN YOU MUST CONSULT WITH THE OCCUPATIONAL HEALTH PHYSICIAN.

NOTE: YOU **DO NOT** RETURN THIS QUESTIONNAIRE TO THE DEPT SAFETY OFFICER.
IT IS ONLY TO BE GIVEN TO THE OCCUPATIONAL HEALTH PHYSICIAN.
STRICT MEDICAL CONFIDENTIALITY PROTECTS THIS INFORMATION.

NAME & ADDRESS OF YOUR GP WHO MAY BE CONTACTED BY OCCUPATIONAL HEALTH PHYSICIAN.

NAME: ……

ADDRESS: ……

Appendix X - Pregnancy or Lactation Register

Department of Mechanical & Manufacturing Engineering
Trinity College Dublin
Pregnancy or Lactation Register

The Safety, Health and Welfare at Work Act, 2005 [Pregnant Employees Regulations, SI No. 218 of 2000 and The Safety, Health and Welfare at Work (General Application) Regulations SI No. 299 of 2007, Part 6, Chapter 2, Protection of Pregnant, Post Natal and Breastfeeding Employees (the Pregnancy Regulations)] requires female employees who either know or who believe themselves to be pregnant to declare their pregnancy to their employer as soon as possible so that a risk assessment can be performed taking account of the new circumstances. The same procedure must be undertaken when a mother is proposing to breastfeed her infant. This Form is the start of an initial risk assessment process once pregnancy/lactation has been declared to the PI & Safety Officer. The final written risk assessment must be completed by the PI (or Head) once pregnancy/lactation has been declared to the PI (or Head).

Name: _____ Staff/Student I.D. No.: _____

Category of personnel:

Staff: _____

Undergraduate: _____

Postgraduate: _____

Research Fellow: _____

Other: _____

Supervisor/PI: _____

Date of pregnancy declaration: _____

1: Preliminary identification of hazards directly associated with your present work

2: List hazards presented by work activities of close colleagues:

3: Detail existing controls used in your own work with these hazards:

4: Do you believe that existing controls are adequate and sufficient? Yes/No
If 'No' then what needs to be changed, in your view?

5: Do you anticipate any change in your (or that of close colleagues) work patterns over the coming 9 months that might have a bearing on your safety and health? Yes/No
If 'Yes', then what is likely to change, in your view?

6: Are you ever in a 'lone-worker' situation at present? Yes/No
If 'No', is it likely you may be so in next 9 months?

7: Do you have suitable and comfortable seating in your lab or office? Yes/No

8: Do you have to spend more than one hour per day using a computer or instrument driven by a microprocessor? Yes/No

9: When do you propose to inform your Supervisor (or Head) of your condition?

_____ _____

Signature Dept. Safety Officer

Other information/resources:

- Please note that the Regulations state under Ch. 1 "**Pregnant, postnatal and breastfeeding employees" Section # 24.** An employer shall ensure that pregnant, postnatal and breastfeeding employees are able to lie down to rest in appropriate conditions.
- Pregnancy Regulations (2000). HSA guidelines at http://www.hsa.ie/eng/FAQs/Pregnant_at_Work/ and
- http://www.hsa.ie/eng/Legislation/Acts/Safety_Health_and_Welfare_at_Work/General_Application_Regulations_2007/Pregnant_PostNatal_Breastfeeding_Guidance.pdf
- 'Working safely with ionising radiation: Guidelines for expectant or breastfeeding mothers' brochure (HSE, UK. 2001) available at http://www.hse.gov.uk/pubns/indg334.pdf
- 'A Guide for New and Expectant Mothers Who Work' (HSE, UK. 2005) available at
- http://www.hse.gov.uk/pubns/indg373.pdf
- Working with VDU's flyer (HSA)

Appendix XI - TCBE Welcome Document

Welcome to the Trinity Centre for Biomedical Engineering

All new members of Trinity Centre for Biomedical Engineering (TCBE) should access and review the *TCBE Lab Users SharePoint Website* for important information regarding Induction, Health & Safety, Lab Access, SOPs etc.

SharePoint Link: https://tcdud.sharepoint.com/sites/TrinityCentreforBioengineering
Contact Dr. Simon Carroll at scarrol6@tcd.ie for access.

A checklist is available on the SharePoint site that summarizes all the documentation/training that personnel must complete/undertake prior to commencing activities in TCBE labs.

Trinity Centre for Biomedical Engineering
The Trinity Centre for Biomedical Engineering has five research themes: Neural, Regenerative Medicine, Biomaterials, Musculoskeletal and Cardiovascular.

Access to TBSI
Swipe card access is essential to gain entry to TCBE on level 3. If your TCD ID card will not work, students should contact academic.registry@tcd.ie, whereas Post-Docs and other staff members need to go to contact the HR office at hr@tcd.ie. Door access codes can be found on the *TCBE Lab Users SharePoint Website.*

Labs and Facilities
There are 8 specialist laboratories which are equipped to a very high specification:

1. Tissue engineering using Animal derived stem cells.
2. Tissue engineering using Human derived stem cells.
3. Tissue (Bone and Muscle) preparation lab.
4. Tissue testing lab (Bone, Muscle and cell).
5. Microscopy Suite (includes nano-indentor, microCT and epifluorescent microscope).
6. Biomaterials lab.
7. Impact Biomechanics lab.
8. Medical Device Design lab.

Most of these are located on level 3 of Trinity Biomedical Sciences Institute.

The Microscopy Suite is located in Parsons building, for all enquiries regarding equipment please contact Peter O'Reilly (poreilly@tcd.ie) or Simon Carroll (scarrol6@tcd.ie). For equipment booking use this link: http://www.tcd.ie/bioengineering/facilities/

Communications: Emails, Internet and Intranet, Newsletter
Email access is paramount for establishing and maintaining contacts. You have access to email internally in TCD and can access it externally also from any web-based PC. Please email IS Services helpdesk@tcd.ie if you have any email issues.

The TCBE website is www.tcd.ie/bioengineering. As you will see on our home page, each research theme has its own website which also functions as an intranet for the researchers in each group. It is important to

keep these research theme websites up to date with the latest information on people in the group, research output, events etc. To update your profile in the research theme website please request the password from the relevant PI. See People section of the Neural website for how it should be done: http://www.mee.tcd.ie/neuraleng/People

TCBE emails a regular newsletter to all PI's, postdoctoral fellows, and postgraduates. If you have any submissions that you would like to make to the next edition, please email them to the Executive Officer (tcbe@tcd.ie). We welcome all news including journal publications, presentations at conferences, industrial or clinical collaborations, awards and research grants and new members to the teams.

Visitors to the Lab

We frequently have visitors to the Trinity Centre for Biomedical Engineering from funding agencies, industry and other prestigious educational institutes.

On occasion, you may be asked to describe your research area and the main purpose of it. For example, "I am working on EEG signal processing, which means that we are trying to extract diagnostic information from EEG signals during a cognitive task acquired using scalp electrodes. To do this I am manipulating these signals mathematically etc." Posters from conferences are used to help describe to visitors the results of our research.

These visits can be important for funding and financial support. To give the best impression, it is important to keep a tidy desk policy at all times in preparation of these visits. Please keep personal belongings in your under-desk units and keep shelves above desks organized.

Productive & environmentally friendly working environment

The most important thing about carrying out research in TCBE is that it should be enjoyable. You should enjoy working in your project area and working in the Trinity Biomedical Sciences Institute.

Here are some minor general housekeeping rules to bear in mind:

In order to be mindful of your co-workers, please make sure your mobile phones are kept on silent and take phone calls outside of the office/lab area. For discussions with colleagues please use the knowledge exchange on level 2 or use the TCBE meeting room. If you wish to book the meeting room, please email tcbe@tcd.ie

To reducing waste levels and recycle the maximum volume of waste possible this building is the first building on campus where all offices are 'bin- less'. Instead of a bin at each desk there are central recycling points in accessible areas on all floors throughout the building (located opposite printer). Any non-recyclable waste should be placed in the general waste bins.

Printing – only print when necessary to reduce waste levels. Please set your printing to print double sided and in greyscale unless colour is essential.

The kitchen is one of the first areas visitors see when they enter the main reception area and must always be kept tidy and clean. Please wash, dry and put away any utensils - do not leave them on the sink.

TCD's IP Policy

For full information on IP Policy and technology transfer please see this web link on the Technology Transfer Office's website http://www.tcd.ie/research_innovation/technology/ip-policy.php

Health & Safety
Note that detailed information regarding Health and Safety in TCBE can be found on the *TCBE Lab Users SharePoint Website*.

Safety Statement & Project Risk Assessment
It is mandatory that all personnel familiarize themselves with college policies regarding health and safety which can be found here: http://www.tcd.ie/Buildings/Safety/safetyhealthandwelfare.php

In addition, before any work may commence the safety document must be completed (i.e. Project Risk Assessment and Personnel Risk Assessments) and signed by the researcher in consultation with the principal investigator (PI). The safety statement may be downloaded here: http://www.tcd.ie/mecheng/safetystatement/. Once you have read the safety statement, you must sign the relevant sections and upload them to the TCBE SharePoint Site.

Safety training
There are various annual courses that "wet" lab personnel must attend. Examples include:

- Fire Safety & Extinguisher Training
- Safe Handling of Cryogenics such as Liquid Nitrogen
- Working with Compressed Gases
- College Radiological Protection Workshop
- College Biological Safety Workshop
- College Chemical Safety Workshop
- Laser Safety Training

Details of these courses can be found here: http://www.tcd.ie/Buildings/Safety/safetytraining.php

Biological Based Research (e.g. cell culture or tissue testing)
It is necessary to make contact with Dr Simon Carroll (scarrol6@tcd.ie) who is the TCBE Safety Officer to ensure sufficient and appropriate training has been provided before any "wet" lab work may be performed in TCBE facilities. Any individual proposing to undertake work (research or teaching) involving potential exposure to a biologically hazardous material must comply with the College Biological Agents Policy, and the provisions of all relevant legislation, in particular the Safety Health and Welfare at Work (Biological Agents) Regulations 1994, as amended 1998. Biologically Hazardous Materials include micro-organisms-natural or genetically modified, cell cultures, human endoparasites, human or animal tissues, fluids, preparations and derivatives, which may be able to cause any infection, allergy, or toxicity. It is the responsibility of each user of biologically hazardous material in College to ensure that the provisions of this policy are complied with. Before undertaking work with biological agents, the prior approval of the College Biohazard Officer is required. All work with chemicals must be done in the chemical fume hood within each lab.

Health Surveillance.
The College Occupational Health Physician will provide health surveillance as deemed necessary and will offer appropriate immunisation/vaccination where applicable. For example, immunisation is required for all personnel whose intended activities in College involve working with human cells or biological tissues. Typical vaccinations include **Hepatitis A**, **Hepatitis B** and **Tetanus**. Where immunisation is required, this will be paid for by the Department or Principal Investigator in question. Those receiving immunisation will be informed of the benefits and drawbacks of both immunisation and non-immunisation, and any offer of immunisation, which is refused, must be in writing. The Occupational Health Physician will keep records of any such health surveillance, in accordance with the requirements of the Biological Agents Regulations 1994, as amended 1998. The immune status of such individuals may have to be assessed before permission can be given for work to proceed, and it should be noted that at least six months may elapse before this can be determined in many cases.

Any individual working with biologically hazardous materials or chemical reagents who becomes pregnant or immunocompromised must immediately advise their PI, Departmental Safety Officer and TCBE Safety Officer, so that a further risk assessment can be undertaken. The TCBE Safety Officer may also act as a liaison between pregnant researchers and their respective supervisors or PIs to provide advice/guidance on best work practices and safety/risk issues.

Bioresources Unit (BRU)
All personnel wishing to access the Bioresources unit (BRU) are required to have a medical examination and register for a personnel code. Please discuss your individual requirements with your PI. Guidelines and policies of the BRU may be found here: http://www.tcd.ie/BioResources/

Personal Protective Equipment (PPE)
It is standard policy of TCBE to wear personal protective equipment (PPE) such as lab coats, gloves, face masks and safety glasses/ ear defenders (when necessary) in all laboratories at all times. PPE must not be worn outside designated laboratories such as corridors, offices, toilets or common areas.

Chemical Safety
The use of dangerous chemicals is strictly controlled by specific legislation, Safety, Health & Welfare at Work (CHEMICAL AGENTS) Regulations, 2001. The Regulations cover all chemical agents in the workplace, see page 14 of the Departmental Safety Statement for further details. In particular, new lab members should note that:

1. Hazardous substances may not be ordered without the permission of the TCBE Safety Officer.
2. All lab members must attend the College Chemical Safety Workshop.
3. All personnel using any chemical in the lab must read the manufacturer's Material Safety Datasheet (MSDS) for that chemical before using it for the first time.
4. All work involving chemicals must be carried out in a fume hood making full use of safety goggles, safety clothing and gloves.
5. Users must at all times adhere strictly to the guidelines for correct fume cupboard usage.
6. All stocks of chemicals or hazardous substances used in the Centre must be properly stored in suitable chemical storage presses.
7. All chemicals or hazardous substances used in the Centre must be clearly labelled including warning signs.
8. All chemical waste must be clearly labelled and disposed of promptly through College's Hazardous Materials Facility (HMF).

Affiliations for Conference Abstracts/Papers and Journal Articles
It is necessary on publications to include both the Trinity Biomedical Sciences Institute (TBSI) address and that of the department you are registered with for a higher degree (i.e. Dept. Mechanical Engineering or Dept. Of Electronic Engineering) and any other associated affiliations. This is so both TBSI and the School of Engineering will be accredited with the publication which is important for university world rankings etc. Please consult with your PI regarding this matter before submitting any publication.

Example:
Expansion in the Presence of FGF-2 Enhances the Functional Development of Cartilaginous Tissues Engineered using Infrapatellar Fat Pad Derived MSCs. C.T Buckley [1,2] and D.J. Kelly [1,2]

[1]Trinity Centre for Biomedical Engineering, Trinity Biomedical Sciences Institute, Trinity College Dublin, Ireland
[2]Dept. of Mechanical and Manufacturing Engineering, School of Engineering, Trinity College Dublin, Ireland.

If you have any questions or need assistance at any stage, email tcbe@tcd.ie

Appendix XII - Acknowledgement forms

All users of the facilities within Department of Mechanical & Manufacturing Engineering (including Trinity Centre for Biomedical Engineering) are required to sign the appropriate Acknowledgement Forms (see below) prior to commencing activities within the Department.

The completed forms should be returned to the local Safety Officer or uploaded to a storage location specified.

For environmental and sustainability reasons, users are encouraged to complete and sign the form using Adobe Acrobat Reader's **Fill and Sign** function (icon:).

This feature allows the reader to:

- … Type and freely place text in each of the required fields.
- … Draw a personalized signature using a mouse / trackpad / touchscreen which can be placed in the appropriate field. This signature can be saved for future use.
- … Save and email/upload the modified PDF document, thereby avoiding the need to print a hard copy.

Adobe Acrobat Reader can be downloaded from https://get.adobe.com/reader/

Department of Mechanical & Manufacturing Engineering
Trinity College Dublin

STUDENT ACKNOWLEDGEMENT FORM

This form must be completed by all

- undergraduate / postgrad students
- summer / occasional students
- Interns

Name: …… (USE BLOCK CAPITALS)

Contact Details

Home address	**Irish address (if different)**
……	……
……	……
……	……
……	……
……	……
Tel #: ……	**Tel #:** ……

E-mail address ……

Project supervisor: ……

SAFETY AGREEMENT

1) I have read and understand the Departmental Safety Manual.

2) I understand that in the Laboratories or workshops, I am to assist staff and Postgraduate research students, working only under their direct supervision.

3) I understand that I am not permitted in the Mechanical & Manufacturing Engineering Buildings or laboratories outside working hours. (9am-10pm Monday to Friday, 9am-6pm Weekend)

Signed*: …… **Date:** ……

**E-signatures are encouraged*

Department of Mechanical & Manufacturing Engineering
Trinity College Dublin

STAFF ACKNOWLEDGEMENT FORM

This form must be completed by all members of staff (this includes post-doctoral researchers)

I …….. Print Name here …….. have read and understood the Safety Statement issued by the Department of Mechanical & Manufacturing Engineering Department. I agree to be bound by the rules for the maintenance of a safe working environment within the Department.

Signed*: …… **Date:** .....

**E-signatures are encouraged*

COMPLETED FORMS MUST BE RETURNED TO THE LOCAL SAFETY OFFICER.

Trinity Centre for Biomedical Engineering
Trinity College Dublin

MEMBER ACKNOWLEDGEMENT FORM

This form must be completed by all personnel who intend to perform activities in Trinity Centre for Biomedical Engineering.

I have read the "**Welcome to the Trinity Centre for Biomedical Engineering**" document and understand its contents.

Print Name: _____

Signed*: _____

Date: _____

**E-signatures are encouraged*

COMPLETED FORMS SHOULD BE UPLOADED TO THE TCBE LAB USERS SHAREPOINT SITE:

See link below for details:
https://tcdud.sharepoint.com/sites/TrinityCentreforBioengineering/SitePages/Health-%26-Safety--Requirements-for-New-Members.aspx

Appendix XIII - Biological Agents Personnel Training Record

See https://www.tcd.ie/estatesandfacilities/health-and-safety/Lab-Safety/biological-safety/ for the most recent version and further information on how to complete this form.

Date Received:	
Approval Date:	

Biological Agents Personnel Training Record

GENERAL DETAILS:

Name:	
Staff / Student Number:	
Employment status:	
School / Unit:	
Lab / Unit No:	
Lab / Unit telephone:	
E-Mail:	
Name of Principal Investigator / Supervisor / Manager: (where relevant)	
Bio Reg. Number: (from Biological Agents Project Risk Assessment form)	
List title(s) of research project(s):	
Work commencement date:	
Expected completion date:	
Name of Local Safety Officer (LSO):	
Have you registered with your LSO	**Yes** ☐ **No** ☐

Refer to Biological Agents Project Risk Assessment form to enable completion of the following section.

HAZARD IDENTIFICATION

i) Biological agents to be used:

Biological Agent(s)	Risk Group *(Select from 1-3)*

Containment Level required (Specify the containment level required)

Level 2 ☐ **Level 3** ☐

Refer to **Safety Health and Welfare at Work (Biological Agents) Regulations 2013.** This legislation can be found at: http://www.irishstatutebook.ie/

COMPETENCE

Please outline your experience to date in working with biological agents, and any qualifications you may have, or workshops / seminars you may have attended relevant to biological safety. [Please attach a copy of any relevant certificate(s)]

Note: Trainers must be suitably qualified and experienced (>1 years in-house experience)

TRAINING / ORIENTATION COURSES ATTENDED

	Required		Date Trained	Trainer name & Signature
	Yes	No		
College Biological Safety Workshop (append training cert)				
Online Containment Level 2 Induction (append assessment cert)				
Online Containment Level 1 Induction (append assessment cert)				
Radionuclide Safety Workshop (append training cert)				
Chemical Safety Workshop (append training cert)				
Safe Handling of Cryogenic Liquids (append training cert)				
Animal Handling Training (append training cert)				

Lab orientation – given by a qualified personnel				
Site specific - evacuation route and procedure - given by qualified personnel				
Site specific - location and use of emergency resources: eyewash, shower, spill kit, first aid kit, etc.				
Provision and use of personal protective equipment, lab coat, eye protection, masks, appropriate gloves, etc.				
Location and use of Safety Data Sheets & laboratory documentation.				

Expand spaces as required

HAZARD / RISK SPECIFIC TRAINING		
Standard Operating Procedures (SOPs) and protocols	**Date Trained**	**Trainer name & Signature**
SOP – First Aid		
SOP – Fire Alarm Action		
SOP – Guiding principles		
SOP – Personal Protective Equipment (PPE)		
SOP – Spill Handling Procedure		
SOP – General precautions		
SOP – Centrifuge Safety		
SOP – Sharps Safety		
SOP – Transport within Buildings		
SOP – Autoclave Safety		
SOP – Cell Culture Safety		
SOP – Lab Bio-security		
SOP – Cleaning & Disinfection		
SOP – Biological Safety Cabinet		
SOP – Waste Management		

SOP – Maintenance Records		_____
SOP – GMO Identification		_____
SOP – GMO Risk Assessment		_____
List procedures relating to work to be undertaken:		_____
Other documents - *supervisor to list any other biosafety related documents to be read:*		_____

ADDITIONAL READING / INFORMATION:	
	Date read
Emergency procedures, these procedures can be found at https://www.tcd.ie/estatesandfacilities/health-and-safety/Emergency-Procedures/	
Laboratory Coat Policy: http://www.tcd.ie/Buildings/Safety/Lab%20Coat%20Policy_051212.docx	
Biological agents: Managing the risks in laboratories: http://www.hse.gov.uk/biosafety/biologagents.pdf	
Laboratory Biosafety Manual - Third Edition http://www.who.int/csr/resources/publications/biosafety/WHO_CDS_CSR_LYO_2004_11/en/	

Specify if health surveillance is required: *You must consult the College Health Service*

Specify if there is there an effective vaccine available for any of the pathogens handled in this work: *(Advice can be obtained from the College Health Service. College is required to offer immunisations to individuals who may be exposed to pathogens at work where an effective vaccine is available.)*

The information supplied in this questionnaire is accurate and correct to the best of my knowledge. I hereby undertake to comply with the provisions of the College Biological Safety Local Rules, and all relevant biological and safety legislation and guidance. I understand that I may not commence work with biological agents without the prior approval of our Local Safety Officer. I undertake to report all accidents / incidents to our Local Safety Officer as soon as possible after occurrence. I confirm that there is no medical reason why I should not undertake the proposed research work (make an appointment with the College Occupational Health service if you are unsure, ext. 1556). I undertake to advise our Local Safety Officer if there are any changes in our medical circumstances that might warrant a re-assessment. I understand that if the nature or extent of the work described here changes then I need to reassess the risks and that a new application may have to be made.

Signed: _____ __/__/__

Trainee

Signed: _____
Principal Investigator/Supervisor/Unit Manager **Date:** __/__/__

I hereby advise that I am satisfied that the above proposed research work can be undertaken in a safe manner, taking into account the facilities available and the competence of the researcher in working with biological agents.

Signed: _____
Local Safety Officer **Date:** __/__/__

Appendix XIV - Biological Agents Project Risk Assessment

See https://www.tcd.ie/estatesandfacilities/health-and-safety/Lab-Safety/biological-safety/ for the most recent version and further information on how to complete this form.

Trinity College Dublin
Coláiste na Tríonóide, Baile Átha Cliath
The University of Dublin

Date Received:	
Date Reviewed:	

Biological Agents Project Risk Assessment

This form must be completed to comply with the provisions of;
The Safety Health and Welfare at Work (Biological Agents) Regulations 2013. If you are using any chemicals, a separate chemical Risk Assessment must be completed.

A key requirement of the legislation is to assess the risks associated with projects involving the use of biological agents. Biological Agents include, micro-organisms- natural or genetically modified, cell cultures, human endoparasites, human or animal tissues, fluids, preparations and derivatives, which may be able to cause any infection, allergy, or toxicity.

NOTES:

- This risk assessment is intended for use by individuals (usually Principal Investigators (PI) / Project Supervisors / Managers) that will undertake or supervise work, which may involve exposure to materials which may be biologically hazardous.
- Conduct/record periodic reviews and notify significant alterations using a new form.
- This form is not for assessing the risks associated with genetically modified activities.
- This form should only be completed after reading the appropriate legislation and guidance notes, available at https://www.tcd.ie/estatesandfacilities/health-and-safety/Lab-Safety/biological-safety/
- All biological materials should be treated as being potentially hazardous until proven otherwise.
- If the risk assessment defines the activity as Risk Group 1 or Risk Group 2, please complete this form and append a copy of the standard operating procedures (SOPs), information for workers concerning facility use and the emergency response plans.
- If the risk assessment defines the activity as Risk Group 3, please complete this form and append a copy of the SOPs, information for workers concerning the operation of the Containment Level 3 facility and the emergency response plans.
- Prior to commencement of any work this form **MUST** be:
  - reviewed by the School Safety Officer (SSO);
  - reviewed the College Biohazard Officer (CBO); and
  - subsequent submission to Health and Safety Authority 30 days prior to commencement of work with respect to the following:
    - First time use of a group 2 biological agent.
    - First time and subsequent use of a group 3 biological agent.

GENERAL DETAILS:

Name of PI / Supervisor / Manager:	
Staff Number:	
School / Department / Centre:	
Lab / Unit No:	
Lab / Unit telephone:	
E-Mail:	
Title of this research project:	
Work commencement date:	
Expected completion date:	
Address of premises where the biological agent will be stored or used (if different) to above.	
Type of notification (first time / Re-notification). If re-notification, state reason why	
Name of School Safety Officer (SSO):	
Have you registered with your SSO	**Yes** ☐ **No** ☐
List of persons likely to be exposed to the Hazardous Biological Agents: (also take into account cleaners, visitors, engineers, security staff, other research groups personnel etc.)	

COMPETENCE:

Please outline yours and research personnel's experience to date in working with biological agents, and any qualifications you may have, or workshops / seminars you may have attended relevant to biological safety. [Please attach a copy of any relevant certificate(s)]

In the following form, the spaces may be expanded as required. The spacing in the master version is not indicative of the length of answer expected.

PREMISES WHERE THIS WORK WILL BE CARRIED OUT -
Laboratory work:
Animal work if relevant:

1. SUMMARISE THE ACTIVITY
i) Overview of work: *(Provide a brief yet clear outline of the aims and objectives in simple lay terms.)*
ii) Description of procedures: *(Describe the types of laboratory procedures to be used and highlight any non-standard laboratory operations. Identify any procedure that may require additional control measures such as* ***generation of aerosols, in vivo work, deliberate culture of Class 3 biological agents, transport, storage, centrifugation, incubation of biological Agents, working with animals, using sharps, bioreactors*** *etc.)*

iii) Biological agents to be used: *(Provide details of the agents involved and/or, where appropriate, details of materials that may contain biological agents. In the case of such materials include the nature and the source of the material; reference or clinical material (include reference culture collection ID if applicable)*

iv) Quantities used and frequency of use: *(This information is vital if potential exposure and hence potential risk are to be accurately assessed under the conditions of use in the particular application. Indicate the scale of the work in terms of maximum culture volumes at any time shown as multiples of unit volumes.)*

2. IDENTIFY THE HAZARDS AND ASSESS THE RISKS TO HEALTH AND SAFETY

Identify hazards:

i) Advise which biologically hazardous materials you may potentially be exposed to and which hazard classification do these biological materials come under (Please refer to the 1st schedule of the Safety Health and Welfare at Work (Biological Agents) Regulations 2013:

This legislation can be found at: http://www.irishstatutebook.ie/eli/2013/si/572/made/en/print

Please attach the Biological Safety Data Sheet (BSDS) when submitting the risk assessment for review.

If you are unsure, please consult with the College Biosafety Officer.
*****Please note that *there are no facilities available in College for undertaking work with Risk Group 4 Biological Agents, and consequently work with Risk Group 4 Biological Agents is prohibited.*

Type of biological agents being notified (bacterium /virus /fungus / parasite / other).	
Biological Agent(s)	Hazard Group *(Select from Risk Group 1-3)*

ii) Identify <u>potential</u> route(s) of infection in the laboratory:

Percutaneous Yes / No	Inhalation Yes / No	Ingestion Yes / No	Splash in eyes or mouth Yes / No	Animal bite or scratch Yes / No

iii) Describe any disease that may be caused by the identified biological agent: *(including symptoms, severity, routes of transmission, availability of vaccine, prophylaxis or other treatment etc.)*

iv) Identify any particular group of workers who may be at increased risk: *(for example pregnant workers, young persons under 18, disabled workers, those with pre-existing disease that increases susceptibility.) If you may be, please discuss this matter in confidence with your School Safety Officer or request an appointment with the College Health Service to discuss this matter in confidence.*

Anyone who might have compromised resistance to disease for any reason should seek advice from the College Health Service ext. 1556, regarding the need for additional precautions.

v) Could a less hazardous biological agent (or form of the agent) be used instead? *(If it can, then it should be used or justification be given here why it is not being used.)*

3. DECIDE WHAT PRECAUTIONS ARE NECESSARY TO PREVENT OR CONTROL THE RISKS

i) Containment Level Required *(The Risk Group classification typically defines the recommended Containment Level)*

Level 1 ☐ **Level 2** ☐ **Level 3** ☐

Refer to **Safety Health and Welfare at Work (Biological Agents) Regulations 2013.** This legislation can be found at: http://www.irishstatutebook.ie

ii) Specify what measures are required to control the risks: *(Risks must be adequately controlled to prevent exposure or to minimise it to such an extent that any harm is unlikely to result from the exposure.) Consider how your procedure may affect people who are not directly involved in the work (e.g. cleaners, security staff, service engineers, contractors, visitors, members of the public) and ensure your control measures protect them too.*

iii) Engineering control measures and facilities required: *(Specify whether a microbiological safety cabinet (or isolator for in vivo work) is required. This is the only appropriate engineering control measure for airborne microbiological hazards and this is not always required. Where one is required then specify what type - select from Class I, II or III.)*

Which of the following measures will be required to undertake the work in compliance with the 2nd schedule of the Safety Health and Welfare at Work (Biological Agents) Regulations 2013?

		Yes	No
1	The workplace should be separated from any other activities in the same building:		
2	Input and / or extract air to be filtered using HEPA or likewise:		
3	Access to be restricted to nominated workers only:		
4	Workplace to be sealable to permit disinfection:(Append associated SOPs)		
5	Specified disinfection procedures required: (Append associated SOPs)		
6	Workplace to be maintained at an air pressure negative to atmosphere:		
7	Effective vector control required (rodents / insects):		
8	Surfaces impervious to water and easy to clean:		
9	Surfaces resistant to acids, alkalis, solvents, disinfectants:		
10	Safe / secure storage facilities:		

11	Observation window:		
12	Lab to contain its own equipment:		
13	Suitable containment such as biological safety cabinet or isolator: (Append associated SOPs)		
14	Incineration service available for disposal of animal carcases: (Append associated SOPs)		
15	Access to autoclave facilities for rendering waste safe: (Append associated SOPs)		

iv) Access Control: *(Advise what access control measures are available in your laboratory facility (eg. digital door lock, swipe code access, key lock on door etc.)*

v) Training: *Describe what specific training is required*

vi) **Supervision:** *Describe what level of supervision is in place. (The level of supervision must always be appropriate to the competence of the individuals involved in the work activity and the level of risk.)*

vii) Biological inventory list:

I confirm a biological inventory list will be kept up to date detailing, location(lab number, fridge/freezer/ storage box ID), concentration/titre/number of vials:

Yes No

☐ ☐

viii) Waste Production, Treatment and Disposal: Specify what types of waste are likely to be produced? (liquid, solids, sharps, radiological, other) An attempt must be made to quantify possible waste production under the aforementioned headings. Append SOPs where appropriate.

How is it intended to;

Store this waste:

Treat this waste:

Dispose of this waste:

With regard to waste storage, treatment and disposal, you must consult with the College Hazardous Materials Facility (HMF), Mr. Marcus Phelan at ext. 3565.)

I confirm that I have consulted HMF regarding TCD waste protocols:
Yes No
☐ ☐

ix) Assess the reduction in risk as a result of the proposed control measures:

x) Emergency procedures:
I confirm that I have read and understand the College Emergency Procedures:
Yes No
☐ ☐
These procedures can be found at
https://www.tcd.ie/estatesandfacilities/health-and-safety/Emergency-Procedures/

I confirm that I have an adequately supplied spill kit available in my laboratory for dealing with spillages of biological materials, and for cleaning and decontamination of biologically contaminated surfaces or personnel:

Yes No
☐ ☐

4. ENSURE CONTROL MEASURES ARE USED AND MAINTAINED

Specify what, if any, checks on control measures are required and state the frequency of inspection needed: *(It must be ensured that control measures work and continue to work properly. Simple visual inspections may suffice or in some cases more detailed examinations, especially of engineering control measures, may be required. Microbiological safety cabinets are required to be tested for containment efficacy annually or every 6 months in CL3.) Efficacy test of chemical disinfectants must be conducted.*

5. HEALTH SURVEILLANCE
Specify if health surveillance is required: *You must* consult, in the first instance with your School Safety Officer. The SSO may decide to refer you to *the College Health Service.*
Specify if there is there an effective vaccine, prophylaxis or treatment available for any of the pathogens handled in this work: *(Advice can be obtained from the College Health Service. College is required to offer immunisations to individuals who may be exposed to pathogens at work where an effective vaccine is available.)*

6. SAFETY COSTS

Proposed Funding Agency / Source: (eg. College, SFI, HRB, Welcome, NIH, EU, Commercial Contract, Other) please specify.

Have the following potential safety costs been considered in the financing of this research project? The Principal Investigator must ensure that adequate funding is available for safety requirements.

Suitable laboratory facilities:	
Necessary equipment, apparatus, instruments, labware:	
Personal Protective Equipment:	
Waste disposal:	
Training:	
Health surveillance / vaccinations for personnel:	
Suitable biological packaging for transportation:	
Special cleaning / decontamination agents:	
Appropriate maintenance/service contracts on Biosafety Cabinets and other equipment	
Other – Please specify:	

7. SIGNATURES:

Please sign the declaration below, and return to your School Safety Officer for review.

The information supplied in this questionnaire is accurate and correct to the best of our knowledge. We hereby undertake to comply with the provisions of the College Biological Safety Local Rules, and all relevant biological and safety legislation and guidance. We understand that we may not commence work with biological agents without the prior approval of our School Safety Officer and review by the College Biological Committee. We undertake to report all accidents / incidents to our School Safety Officer and the College Biological Safety Officer as soon as possible after occurrence. We both confirm that there is no medical reason why we should not undertake the proposed research work (make an appointment with the College Occupational Health service if you are unsure, ext. 1556). We undertake to advise our School Safety Officer if there are any changes in our medical circumstances that might warrant a re-assessment. We understand that if the nature or extent of the work described here changes then we need to reassess the risks and that a new application may have to be made. Finally, we undertake to communicate the contents of this form to all employees and others at the workplace who may be exposed to any risks covered by this risk assessment.

Signed: _____

Principal Investigator / Supervisor / Unit Manager **Date:**

I hereby advise that I am satisfied that the above proposed research work could be undertaken in a safe manner, taking into account the facilities available and the competence of the researcher in working with biological agents.

Signed: _____

School Safety Officer **Date:**

For completion by the College Biological Committee

Proposal Reviewed:

Signed: _____

c/c College Biological Safety Committee **Date:**

This risk assessment must be reviewed annually or more frequently if there is any change in the work, or if new information becomes available that indicates the assessment may no longer be valid. Reviews have been carried out on the following dates and either the assessment remains valid or it has been amended as indicated.	
Name of reviewer: Signature: Amendments:	Date:
Name of reviewer: Signature: Amendments:	Date:
Name of reviewer: Signature: Amendments:	Date:
Name of reviewer: Signature: Amendments:	Date:
Name of reviewer: Signature: Amendments:	Date:
Name of reviewer: Signature: Amendments:	Date

(Revised 2019, College Biological Safety Committee)

Appendix XVI - Identified Hazards

Location	Hazard	Risk Assessment	Control Measures	Person Responsible
Parsons Building & Podium			The Head of Department has overall responsibility for Health and Safety within his area as stated in the College Safety Statement. Day to day duties may be delegated to other individuals as listed in this document.	Head of Department
	Lack of safety management	High	The Head of Department is responsible for appointing a workshop safety officer and fire warden. The Chief Technical Officer has been duly appointed as fire warden and Workshop Safety Officer	Head of Department
			The Head of Department is to appoint a deputy to act in the Chief Technical Officer's absence, to ensure the continuance of all relevant Health and Safety control measures. Mr Derek R. J. Simpson has been duly appointed.	Head of Department
			The Head of Department is to appoint a Departmental Safety Officer and that person so named in the table in Section I of this document is duly appointed. S/He will also deputize in the Head of Department's absence.	Head of Department
			The Head of Department is to periodically review and monitor the Departmental safety statement. The Head of Department is to carry out a risk assessment of all technical functions carried out in the Department.	Head of Department
			A copy of this document to be given to each member of staff.	Head of Department
			All accidents and dangerous occurrences are to be reported to the Departmental Safety Officer, who will report to the Head of Department. These occurrences will be forwarded to the College Safety Officer.	Head of Department
			As a preventative welfare measure, all staff are encouraged to attend a basic fire training session and the Occupational Health Clinic at the Student Health Centre.	Head of Department
			The Departmental and Workshop Safety Officer and deputy are to inform the Head of Department of any problems implementing their respective Health and Safety duties.	Chief Technical Officer, Dept. Safety Officer

Location	Hazard	Risk Assessment	Control Measures	Person Responsible
	Fire	High	The Workshop safety officer is to carry out a weekly check of the workshop area to ensure escape routes are; not obstructed, may be opened from the inside in the direction of escape and free from combustible materials.	Chief Technical Officer
Workshop			The Workshop safety officer is to visually check on a weekly basis all relevant fire extinguishers, fire panels and that break glass unit keys and machinery guards are in place. Any defects or faults found are to be rectified as soon as possible.	Chief Technical Officer
			During fire alarm activations the Fire Warden and Workshop safety officer are to assist in evacuation as far as possible and without putting themselves in any danger. The Head is to deputize for the safety officers listed during their absences.	Dept. Safety Officer & Chief Technical Officer
Workshop	Rotating Machinery and power tools	High	No member of staff or student may use workshop equipment without satisfying the Workshop Safety Officer of their competence. All those using such equipment must obey the prescriptions of the Department's Workshop Safety Manual.	Chief Technical Officer
Workshop	Rotating Machinery and power tools	High	There must be at least two persons present in the Workshop at all times when machinery is in use	Workshop users
			The Workshop safety officer is to periodically ensure that all workshop offices and store rooms are, as far as possible, kept in a tidy manner, free of excess combustible items, and that fire doors are not left constantly wedged open.	Chief Technical Officer
			Staff are reminded that fire exits, corridors access & egress routes are not to be obstructed by equipment, materials, or tools.	Building Users
			Staff are reminded that the assembly point in the event of an evacuation is the "**Flat Iron"**, the triangular lawn next to the Rugby pitch.	Head of Department
			On hearing the fire alarm (a continuous ringing bell) staff are instructed to; **1**- Leave the building with any visitors you are responsible for. **2-** Go to the assembly point. **3**- Re-enter only when the alarm is turned off.	Building Users
			On discovery of a fire staff are instructed to: **1**- Raise the fire alarm. **2**- Leave the building with any visitors you are responsible for. **3**- Inform security centre on ext. 1999. **4**- Go to the assembly point. **5**- Re-enter only when the alarm is turned off.	Building Users

Location	Hazard	Risk Assessment	Control Measures	Person Responsible
			No alterations or repairs to any electrical items fixtures or fittings. The Buildings Office technical staff, qualified electricians or appointed contractors only are to carry out any alterations or repairs.	Building Users
	Fire & electrical shock	High	All electrical items are to be periodically inspected as far as possible for any signs of damage or wear to cords flexes cables mouldings etc. Any defects are to be reported to the Buildings Office.	Building Users
			The use of extension leads, adaptors is to be minimized as far as possible. Electrical sockets are not to be overloaded.	Building Users
			All second hand electrical items introduced into the Department are to be tested for electrical integrity by the user prior to use.	Dept. Electronics Technical Officer
			Open bar electrical fires are not to be used.	Building Users
			All electrical items to be turned off last thing at night, as far as possible.	Building Users
	Fire & passive smoking	High	Smoking is prohibited in the building in accordance with College policy.	Head of Department
	Arson & bomb threats	High	All staff to report suspicious packages or persons to the security centre Ext. 1999 as soon as possible.	Building Users
			All staff are requested to challenge as far as is reasonably practical, any person unknown to staff or not in building on official business.	Building Users
			All staff to keep their offices locked when not in use. Laboratory heads and Workshop safety officer are to ensure their work areas are adequately secured and locked.	Head of Department

Location	Hazard	Risk Assessment	Control Measures	Person Responsible
	Slips trips & falls	Medium	Trailing cables are not to be left in any circulation routes as far as possible. Cables in circulation routes must be kept as short as possible and covered with a cable guard mat.	Building Users
			All plant and equipment is to be arranged so that safe access egress and clear circulation routes are provided.	Head of Department
			All items of disrepair to fixtures, fittings, flooring, stairs or fabric of the building are to be reported to the Head of Department for repair as soon as possible.	Building Users
	Lack of First Aid personnel & facilities	High	Trained first aid personnel are given in Section I After hours contact ext. 1999.	Head of Department
			That first aid cabinets are kept fully stocked.	Chief Technical Officer
	Work environment	High	Adequate lighting must be present to allow the function to be carried out safely. The site must be clear, tidy, safe underfoot, free from electrical or chemical hazards as far as possible.	Head of Department
	Work environment	High	All problems in implementing safe work practices are to be reported as soon as possible to the Chief Technical Officer.	Head of Department
	Plant equipment & machinery	High	No alterations to, interference with, or use of any plant, equipment, or machinery unless authorized and suitably trained to do so.	Building Users
	Use of Chemicals	High	Staff and students are not to interfere with chemicals used by housekeeping staff.	Building Users

Location	Hazard	Risk Assessment	Control Measures	Person Responsible
	Use of Chemicals	High	Instructions supplied with all chemicals used during work are to be followed at all times. All chemicals used by the Department will be subject to a risk assessment.	All Staff
Metals Preparation Laboratory	Use of Chemicals	High	All those using chemicals in this laboratory must ask the Chemical Hazards EO for the appropriate safety data sheets and to adhere to their prescriptions. The Laboratory is to be left clean and tidy at all times, with chemicals correctly stored.	Chemical Hazard EO, Laboratory Users
	Inventory of Chemicals	High	An inventory of all chemicals & quantities (including paints) to be compiled.	Chemical Hazard EO
	Waste disposal of Chemicals	High	All chemicals including waste oils are to be disposed of via the Chemical waste disposal system operated by the Chemistry Department. The Chemical Hazard EO will arrange their transfer to the Chemistry Dept.	Head of Dept., Chemical Hazard EO
	Incorrect lifting & handling	High	All technical staff as far as possible to be trained in manual handling techniques by the College Safety Officer.	Head of Department
	Visitors to the building	Low	All visitors who are present in the building for more than a brief period, are to the responsibility of the host. The hosts to take charge of the visitor(s) in the event of an evacuation or if any specific procedures apply.	The Host
	Changes in office practice	High	Any substantial changes involving the introduction of potentially hazardous materials, equipment or situations must be 'risk assessed' & control measures adopted prior to use. The College Safety Officer will advise on assessments.	Head of Department & Dept. Safety Officer
	Workshop personal protective equip.	High	All personal protective equipment is provided and is required to be worn at all necessary times. Staff are reminded to follow instructions on correct use at all times and to report any defects or missing items.	Head of Department & Chief Technical
	Workshop personal protective equip.	High	All workshop users to wear safety shoes. All impact grinding and welding work to be accompanied by the use of safety goggles.	Head of Department & Chief Technical
	Workshop	High	All fixed electrical machinery to be provided with a labelled isolator.	Head of Department & Chief Technical Officer

Location	Hazard	Risk Assessment	Control Measures	Person Responsible
	Workshop	High	All guards to be in place prior to use. Push sticks to be used at the band saw	Head of Department & Chief Technical
	Late night working	High	Staff to have access to a telephone or radio in the event of an emergency.	Head of Department
	Overcrowding	Medium	The workshop cannot be used by more than 25 persons at once.	Chief Technical Officer
	Lack of consultation	High	Regular Faculty Safety meetings are to be held to review this document and safe systems of work used.	Dept. Safety Officer
	Statutory Engineering Inspections	High	The Head of Department to implement these as necessary.	Head of Department
	Portable Electrical equipment	High	Only110V equipment to be used or otherwise protected by a 30mA ECLB or RCD.	Chief Technical Officer
	Welding	High	To be carried out in the open air or well ventilated areas only. Cylinders are to be stored in fire proof external area.	Chief Technical Officer
	House keeping	High	All workshops, boiler rooms, store rooms, material and equipment stores are to be kept clean tidy and free of excess combustible materials. Section heads to review & inspect. Inaccessible areas given special attention.	Head of Department & Chief Technical Officer
	Work related upper limb disorder &...	Medium	All VDU work stations are to have a suitable fully adjustable chair for any user. The College Safety Officer will define a "user", assess suitability and adjust the chair as necessary.	Head of Department
	RSI...repetitive strain injury		The VDU to be positioned in accordance with good ergonomic principles. The College Safety Officer will advise as necessary	VDU Users

Location	Hazard	Risk Assessment	Control Measures	Person Responsible
	Eye strain	Low	Anti-glare screens to be removed in favour of arranging screens away from window reflections and direct light. The College Safety Officer will advise as necessary. All VDU users are encouraged to attend the Occupational Health Clinic for an eye test.	VDU Users
	Ventilation for equipment	Low	Photocopiers and printers should be located as close to sources of ventilation (e.g. windows) as far as possible. This does not apply if the area is supplied with mechanical ventilation	Chief Technical Officer
	Overcrowding	Medium	Purpose built lecture theatres become overcrowded when the number of students present exceeds the number of seats. This should be avoided as far as possible. In multipurpose rooms the number of desks available will limit the number within.	Head of Department
Fluids Laboratory	Laboratory noise	High	Ear defenders to be worn at all times whilst operating wind tunnels.	Head of Department
Fluids Lab. Vibrations Lab.	Laser anemometer Laser vibrometer	High	This equipment is only to be used by authorized personnel who must adhere to the College's code of practice for this equipment	Head of Department
	Lack of supervision for students	High	Students to be supervised at all times by staff or use a supervised building. When students are granted leisure or study facilities within an unsupervised building the College Safety Officer is to assess suitability.	Head of Department
	Changes in office practice	High	Any substantial changes involving the introduction of potentially hazardous materials, equipment or situations is to be risk assessed & control measures adopted prior to use. The College Safety Officer will advise as to risk assessments.	Head of Department
	Laboratory Exercises	Medium	All students must familiarize themselves with the Department's Electrical equipment Safety Guide before conducting experiments. They must follow the guidance of the demonstrator at all times and only operate equipment in his/her presence.	Head of Department
	Laboratory Exercises	Medium	All demonstrators to be trained in Fire Safety	Head of Department
	Engine test cells (Fire & toxic gases)	High	Staff & students working on Engine test cells must be familiar with, & adhere to the safety instructions for the use of this equipment, which are to be displayed prominently in the area. Lone working of students is not permitted.	Senior Experimental Officer Thermo Labs

Location	Hazard	Risk Assessment	Control Measures	Person Responsible
	Mechanical testing equipment	Medium	Staff and students may not use this equipment unless they have satisfied Mr Peter O'Reilly of their competence. Lone working is not permitted.	Chemical Hazards EO
	Laser welder	High	This equipment is only to be used by authorized personnel who must adhere to the College's code of practice for this equipment	Head of Department
	New practices	High	All new practices functions or equipment to be risk assessed prior to implementation	Head of Department
Parsons Building & Podium	Biological Materials	High	The Head of Department is to appoint a departmental Bio Safety Officer and that person so named in the table in Section I of this document has been duly appointed.	Head of Department
Workshop	Biological Materials	High	All persons handling biological materials must register with the Department & College according to procedures administered by the Departmental Bio Safety Officer. Biological materials will be handled & disposed of as specified in the Departmental Safety Statement.	Bio Safety Officer
	Biological Materials	High	All persons handling biological materials must register with the Department & College according to procedures administered by the Dept. Safety Officer. Biological materials will be handled & disposed of as specified in the Departmental Safety Statement.	Bio Safety Officer

Design Loft				
Machine	**Potential Hazard**	**Control Measures**	**Risk**	**Person Responsible**
Milling Machine Clarke CMD1225	Eye, face, hands and arm injury	Wear safety glasses and use guards. Tie up long hair. Loose clothing (i.e. loose sleeves, ties, hoods, scarves) are prohibited. All jewellery must be removed. Wear the barrier cream provided. Always use clamps/bench vice to securely mount workpiece. Wear hard toe shoes.	Medium	Dr Conor McGinn
Drill press Clarke CDP301	Eye, face, hands and arm injury	Wear safety glasses. Tie up long hair. Loose clothing (i.e. loose sleeves, ties, hoods, scarves) are prohibited. All jewellery must be removed. Wear the barrier cream provided. Always use clamps/bench vice to securely mount workpiece. Wear hard toe shoes.	Medium	Dr Conor McGinn
CNC Router JBEC 106512	Eye, face, hands and arm injury	Wear safety glasses and use guards. Tie up long hair. Loose clothing (i.e. loose sleeves, ties, hoods, scarves) are prohibited. All jewellery must be removed.	Medium	Dr Conor McGinn
Vertical Bandsaw Xcalibur	Eye, face, hands and arm injury	Wear safety glasses and use guards. Tie up long hair. Loose clothing (i.e. loose sleeves, ties, hoods, scarves) are prohibited. All jewellery must be removed. Use of a workpiece pusher is recommended. Wear the barrier cream provided.	Medium	Dr Conor McGinn
Hot Wire Bender CR Clarke H500	Eye, face, hands and arm injury	Wear safety glasses and protective gloves. Loose clothing (i.e. loose sleeves, ties, hoods, scarves) are prohibited. All jewellery must be removed.	Medium	Dr Conor McGinn
Hot Wire Sculptor CR Clarke 280	Eye, face, hands and arm injury	Wear safety glasses and protective gloves. Loose clothing (i.e. loose sleeves, ties, hoods, scarves) are prohibited. All jewellery must be removed. Wear lab jacket to ensure all skin is covered.	Medium	Dr Conor McGinn
Solder Station 60W LCD	Eye, face, hands and lungs injury	Wear safety glasses and use clamp to hold workpiece. Loose clothing (i.e. loose sleeves, ties, hoods, scarves) are prohibited. All jewellery must be removed. Always use lead free solder. Wear lab jacket to ensure all skin is covered.	Medium	Dr Conor McGinn
Hand-drill 18V Portable	Eye, face, hands and arm injury	Wear safety glasses. Tie up long hair. Loose clothing (i.e. loose sleeves, ties, hoods, scarves) are prohibited. All jewellery must be removed. Wear the barrier cream provided. Always use clamps/bench vice to securely mount workpiece. Wear hard toe shoes.	Medium	Dr Conor McGinn