



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

**The Department of Mechanical,
Manufacturing and Biomedical
Engineering**

Safety Statement 2022/23

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University Safety Office

The University Safety Office assist and advise the University community, in ensuring, so far as is reasonably practicable, the health, safety and welfare whilst at work of all employees and students, and the safety of authorised visitors and members of the public entering Trinity College.

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University Safety Office

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Section 0 Introduction and Safety Policies

The purpose of this document is to provide information for all staff and students in the Department. The health and safety of staff, students and visitors is important. The Safety, Health and Welfare at Work Act 2005 requires that you take all precautions, as far as is reasonably practicable, to avoid endangering yourself or others by your activities.

This Departmental Safety Statement along with Codes of Practice for the Department areas are set out below and you must read, understand, and abide by them.

This Safety Statement supplements the University Safety Statement and University Policies which are accessible on the Trinity College Dublin's website.

For the Trinity Centre for Biomedical Engineering (TCBE) located at TBSI, it should be noted that all Schools and Disciplines are required to adhere to the requirements outlined in the TBSI Building Safety Statement as well as their own site-specific Safety Statements which includes contact details, information on the management of the induction and consultation process within the discipline and risk assessments for their area.

0.1 Trinity College, Occupational Health and Safety Policy



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

OCCUPATIONAL HEALTH AND SAFETY POLICY

We of **Trinity College Dublin, the University of Dublin ("Trinity")** value, above all else, the safety and health of our undergraduate and postgraduate students, staff, visitors, contractors and all others affected by our activities and we are committed to working in accordance with the provisions of the Safety, Health and Welfare at Work Act 2005 ("the Act") and associated legislation in order to provide a safe and healthy educational, recreational and residential environment for all. To comply with Section 20 of the Act, we have prepared a Framework (Parent) Safety Statement which sets out the safety management programme in place at Trinity and specifies how safety, health and welfare is secured.

The framework Safety Statement and local Safety Statements for each functional Unit, School or Area are maintained and updated. In addition, each school/unit and research institute has developed and maintained local COVID 19 response plans in line with the Implementation Guidelines for Public Health Measures in Higher Education Institutions to supplement and support the Safety Statements. Trinity is committed to fulfilling our statutory obligations to manage and co-ordinate workplace safety, health and welfare, and to ensure that, so as far as is reasonably practicable, work activities are managed to safeguard the safety, health and welfare of our staff, students, visitors, contractors and others. We will achieve this by carrying out local risk assessments and bringing them to the attention of all staff and students at least annually. Within the risk assessments, protective and preventative measures have been identified, which will be implemented and maintained.

We will provide a safe place of work, including welfare facilities, which are adequately designed, maintained and have a safe means of access and egress. The University buildings and rooms will be adapted to facilitate physical distancing and all recommendations from the COVID 19 Senior Management Group will be fully implemented. Trinity will also provide safe plant and equipment and ensure that safe systems of work are in place.

We will ensure, as far as is reasonably practicable, that any improper conduct likely to put staff, students, visitors or contractors safety and health at risk, is prevented. All staff and students will be provided with the appropriate information, instruction, training and supervision as required to stay safe and healthy. We will, as far as is reasonably practicable, prevent risks to health from articles or substances such as chemicals, nanotechnology, and radiological and biological agents.

Where hazards cannot be eliminated, adequate arrangements in accordance with the General Principles of Prevention, including where required the provision of suitable protective clothing and equipment, will be put in place to reduce the risk of injury. Trinity have plans and procedures to be followed in the event of an emergency or serious or imminent danger.

The College has competent personnel to advise and assist in securing the safety, health and welfare of staff, students, visitors and contractors. A COVID 19 Senior Management group, chaired by the Provost, has been convened to implement and advise on the University's Covid 19 Response Plan. The safety message is communicated to the college community through the College website, the University Safety Committee and its sub committees, local safety officers and safety representatives.



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Our policy is subject to annual review and we appreciate any feedback in relation to this policy that allows us to continually improve our health and safety standards.

Signed: Linda Doyle Date: _____

Dr Linda Doyle, President & Provost, Trinity College Dublin, the University of Dublin

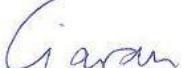
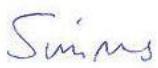
0.2 General Statement of Department Safety Policy

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 of 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: 16th September 2022

Section 1 – Health and Safety Management Structures

The purpose of this document is to provide information for all staff and students in the School while working in laboratories, offices or on field trips. The health and safety of staff, students and visitors is important. [The Safety, Health and Welfare at Work Act 2005](#) requires that you take all precautions, as far as is reasonably practicable, to avoid endangering yourself or others by your activities. The Health and Safety Statement and Codes of Practice for the Department areas are set out below and you must read, understand, and abide by them. You are required to complete the appropriate Acknowledgement Form. Students and staff will be excluded from all laboratories and workshops until they have completed this Acknowledgement. This Departmental Safety Statement supplements the [University Safety Statement](#) and [University Policies](#) which are accessible on the Trinity College Dublin's website.

1.1 Scope of this statement

This statement covers people working in the following areas:

- The Parsons Building
- MMBE areas of the Watts building
- MMBE areas of TBSI
- MMBE areas of SNIAM
- MMBE office space in Stack B

All members of MMBE must read and sign off on this document regardless of which building they work in. In addition, members of the MMBE working in buildings other than the Parsons Building, TBSI for instance, must read and sign off on the TBSI safety statement and comply with any local work practices there.

1.2 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.

1.3 Executive responsibilities

The Head of Department, Professor Ciaran Simms, is responsible for safety in the Department. He 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 Department Safety Officer is Mr. Gordon O'Brien. He has executive responsibility for safety and reports to the Head of Department. He is supported by Mr. Michael Reilly (Chief Technical Officer). If the Safety Officer is absent from the Department, the Chief Technical Officer will perform his safety duties & vice versa.

The Head of Department recognises that the employer's duties as outlined in the Safety Health and Welfare at Work Act 2005 extends, in particular, to the following:

- (a) managing and conducting work activities in such a way as to ensure, so far as is reasonably practicable, the safety, health, and welfare at work of his or her employees;
- (b) managing and conducting work activities in such a way as to prevent, so far as is reasonably practicable, any improper conduct or behaviour likely to put the safety, health, or welfare at work of his or her employees at risk;
- (c) as regards the place of work concerned, ensuring, so far as is reasonably practicable—
 - (i) the design, provision, and maintenance of it in a condition that is safe and without risk to health,
 - (ii) the design, provision, and maintenance of safe means of access to and egress from it, and
 - (iii) the design, provision, and maintenance of plant and machinery or any other articles that are safe and without risk to health;
- (d) ensuring, so far as it is reasonably practicable, the safety and the prevention of risk to health at work of his or her employees relating to the use of any article or substance or the exposure to noise, vibration or ionising or other radiations or any other physical agent;
- (e) providing systems of work that are planned, organised, performed, maintained, and revised as appropriate so as to be, so far as is reasonably practicable, safe and without risk to health;
- (f) providing and maintaining facilities and arrangements for the welfare of his or her employees at work;
- (g) providing the information, instruction, training, and supervision necessary to ensure, so far as is reasonably practicable, the safety, health, and welfare at work of his or her employees;
- (h) determining and implementing the safety, health and welfare measures necessary for the protection of the safety, health and welfare of his or her employees when identifying hazards and carrying out a risk assessment under *section 19* or when preparing a safety statement under *section 20* and ensuring that the measures take account of changing circumstances and the general principles of prevention specified in *Schedule 3*;
- (i) having regard to the general principles of prevention in *Schedule 3*, where risks cannot be eliminated or adequately controlled or in such circumstances as may be prescribed, providing, and maintaining such suitable protective clothing and equipment as is necessary to ensure, so far as is reasonably practicable, the safety, health and welfare at work of his or her employees;
- (j) preparing and revising, as appropriate, adequate plans and procedures to be followed and measures to be taken in the case of an emergency or serious and imminent danger;

(k) reporting accidents and dangerous occurrences, as may be prescribed, to the Authority or to a person prescribed under section 33, as appropriate, and

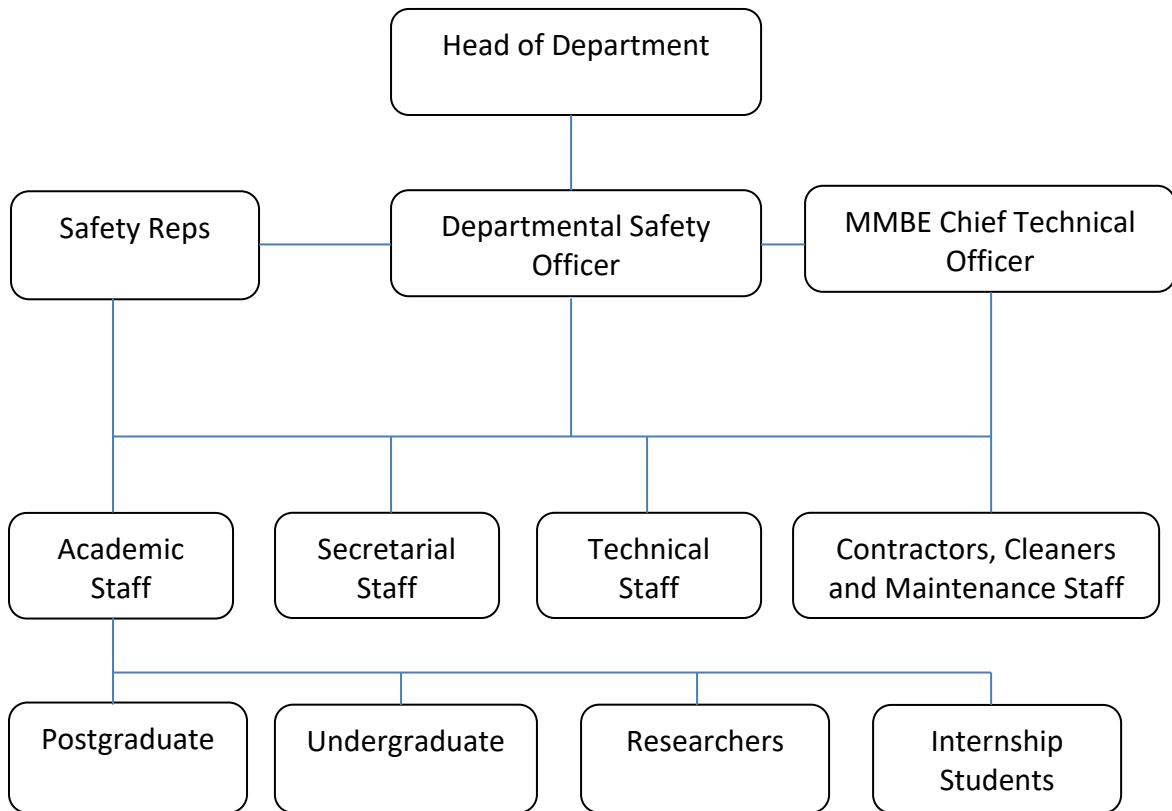
(l) obtaining, where necessary, the services of a competent person (whether under a contract of employment or otherwise) for the purpose of ensuring, so far as is reasonably practicable, the safety, health, and welfare at work of his or her employees.

The Head of Department will specifically:

- Ensure that the Department Safety Statement is prepared, reviewed, and updated as necessary;
- Sign the Statement of Intent and ensure that it is displayed;
- Appoint a Safety Officer to carry out specific duties aimed at ensuring day to day compliance with the policy;
- Appoint Fire Wardens to carry out specific fire safety duties in relation to fire prevention in the department and assisting in the evacuation procedures;
- Demonstrate through personal behaviour that only the highest standards of safety are acceptable;
- Facilitate safety inspections within the Department of Mechanical, Manufacturing and Biomedical Engineering (MMBE);
- Attend a legal briefing to understand their responsibilities;
- Monitor the implementation of the Department Safety Statement;
- Co-operate in the distribution of health and safety documentation and information relevant to MMBE;
- Ensure that all accidents / incidents / dangerous occurrence are reported in accordance with the college's reporting procedures;
- Ensure that staff / students are provided with safety training, by directly organising relevant training or by ensuring the attendance of staff / students at designated courses, as appropriate;
- Arrange for the identification of safety equipment requirements, including Personal Protective Equipment (PPE) within the Department and make arrangements for its provision, as far as is reasonably practicable before work is commenced;
- Co-operate with other college personnel in the management of health and safety within the Department of MMBE;
- Ensure that new members of the Department receive adequate induction with respect to health and safety matters and made aware of the contents of the Safety Statement;
- Ensure that all building rules (e.g., avoiding covering window panels in doors, displaying hazard information on biological and chemical hazards in labs) are communicated and implemented within the Department of MMBE

1.4 MMBE Health and Safety Structure

1.4.1 Organisational Chart



1.4.2 Personnel

Health and Safety responsibilities have been allocated to those shown in the table below.

Health and Safety Responsibility	Name	Title
Head of Department	Prof. Ciaran Simms	Professor and Head of Department
MMBE Chief Technical Officer	Mr Michael Reilly	Chief Technical Officer
Safety Officer(s)	Gordon O'Brien (MMBE) Simon Carroll (TCBE)	Chief Technical Officer Senior Technical Officer
Safety Representative	David Igoe	Assistant Professor
Occupational First Aiders	<u>Parsons Building</u> Mr. Michael Reilly Mr. Alex Kearns <u>Watts Building</u> To Be Confirmed	Chief Technical Officer Senior Technical Officer

Health and Safety Responsibility	Name	Title
	<u>TBSI</u> To Be Confirmed <i>(Training to be refreshed)</i>	
Manual Handling Instructor	Manual handling training is arranged through the Safety Office	
Fire Wardens <i>(Training to be refreshed November 2024)</i>	<u>Parsons Building</u> Ms. Judith Lee Dr. Conor McGinn Dr. Séamus O'Shaughnessy Mr. Gerry Byrne Mr. Alex Kearns Mr. Robert Dunbar Mr. Gordon O' Brien <u>Watts Building</u> Dr. Daniel Trimble <u>TBSI</u> Dr. Simon Carroll	Senior Executive Officer Assistant Professor Assistant Professor Senior Experimental Officer Senior Technical Officer Senior Technical Officer Chief Technical Officer Assistant Professor Senior Technical Officer
MMBE Specialist Safety Areas		
<i>VDU Safety</i>	Ms Judith Lee	Senior Executive Officer
<i>Laser Safety</i>	Dr. Tim Persoons	Associate Professor
<i>Radiation Safety</i>	Mr. Robert Dunbar	Senior Technical Officer
<i>Chemical Safety</i>	Mr. Robert Dunbar	Senior Technical Officer
<i>Biohazards Safety</i>	Mr. Simon Carroll	Senior Technical Officer
<i>Electrical Safety</i>	Mr Paul Normoyle	Chief Technical Officer (Specialist)
<i>Compressed Gas Safety</i>	Mr. Michael Reilly	Chief Technical Officer
<i>Mechanical Safety</i>	Mr. Michael Reilly	Chief Technical Officer
<i>Thermo Lab Safety</i>	Mr. Gerry Byrne	Senior Experimental Officer
<i>STAM Lab Safety</i>	Dr. Garret O' Donnell	Assistant Professor
<i>Design Loft Safety</i>	Dr. Conor McGuinn	Assistant Professor

1.5 Health and Safety Responsibilities within MMBE

It should be noted that 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 MMBE Chief Technical Officer. 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.

Specific roles and responsibilities are set out further below:

1.5.1 MMBE Chief Technical Officer Responsibilities

The MMBE Chief Technical Officer (CTO) will

- Be familiar with the Department of MMBE Safety Statement and its content.
- Eliminate or report unsafe conditions and hazards.
- Ensure that an effective staff safety training programme exists to meet identified needs.
- Ensure all staff under their control are aware of the Safety Statement, Risk Assessments, and the procedures in place for reporting incidents and accidents in a timely manner.
- Ensure that the University's [controls of contractors policy](#) is implemented.
- Be aware of procedures to be followed in the event of an emergency.
- Demonstrate through personal behaviour that only the highest standards of safety are acceptable this includes compliance with the Safety Statement and other company policies and procedures such as the clean desk policy and the promotion of good housekeeping throughout the premises.
- Follow established safe working procedures.
- Assist in accident and incident investigations.
- Provide feedback to the Departmental Safety Officer and Head of Department.
- Ensure that work activities are managed and conducted in such a way as to ensure so far as is reasonably practicable the safety, health, and welfare at work of their employees.
- Ensure that work activities are managed and conducted in such a way as to prevent so far as is reasonably practicable any improper conduct or behaviour likely to put the safety, health, or welfare at work of their employees at risk.
- Where risks cannot be eliminated, provide, and maintain suitable protective clothing and equipment as is necessary to ensure, so far as is reasonably practicable the safety, health, and welfare at work of their employees.

1.5.2 Departmental Safety Officer

The Departmental Safety Officer will:

- Take a direct interest in the health and safety policy and positively support any person whose function it is to carry it out.
- Demonstrate commitment by taking active steps to be aware of the safety record of the premises and shall issue any necessary reasonable directives in the interest of the health, safety and welfare of all employees and others.
- Ensure that responsibility is properly assigned, understood, and accepted at all levels.
- Procure advice and assistance whenever necessary and take heed of any health and safety matters brought to their attention.
- Ensure that all staff under their control are held accountable for their performance in relation to occupational health and safety.
- Ensure that a disciplinary procedure exists for wilful breaches of safety standards contained in the Safety Statement and that all staff are aware of this.
- Demonstrate through personal behaviour that only the highest standards of safety are acceptable.
- Ensure that up to date Safety Data Sheets are maintained for all chemicals on site.
- Commend people who, by action or initiative, eliminate hazards. Suggest ways of minimising hazards and improving safety performance.
- Ensure that the Department Safety Statement including risk assessments is periodically evaluated and revised.
- Ensure that all employees have access to the Safety Statement and have read and understood it.
- Ensure regular inspections of the areas / activities are carried out and remedial action taken where necessary.
- Ensure that induction and safety training of all employees is carried out.
- Ensure that sufficient numbers of staff are aware of action to be taken in the event of an emergency.
- Ensure that an accident report form is completed for all accidents and that all accidents are investigated.
- Record all relevant accidents and dangerous occurrences on [iProtectU](#).

1.5.3 Principal Investigators

Principal Investigators (PIs) are responsible for the research work they undertaken and must take responsibility for the health and safety management of this work.

The Principal Investigator and/or Supervisor is also responsible for the following:

- Determine which hazardous substances are present in the workplace.
- Assess the risks to employees / students and others from the presence of these hazardous substances.
- Prevent or control exposure to the hazardous substances to as low as is reasonably practicable.
- Have arrangements in place to deal with accidents, incidents, and emergencies, including spillages.
- Provide information, training, and consultation to employees / students.
- Make available health surveillance to their employees / students.
- Ensuring the correct disposal of hazardous waste in a prompt fashion and ensuring overstocking of out-of-date chemicals does not occur.

Academic staff have a key role and responsibility in assessing risk and implementing control measures identified to avoid or reduce harm that arises from both teaching and research activities. Safety legislation applies to all aspects of research.

Academic staff are responsible for:

- Undertaking suitable and sufficient risk assessments;
- Applying principles of risk avoidance, in preference to reduction; and
- Identifying and implementing control measures and safe working procedures.

Academic staff are responsible for ensuring that in planning and developing course programmes, research project and any other activities, adequate consideration is given to health and safety. Academic staff are responsible for liaising with technical staff to ensure there is adequate health and safety instructions, training, and supervision in relation to teaching and research activities.

Researchers are responsible for the following:

- Co-operate with the PI and / or Supervisor e.g., follow procedure, SOPs, policies etc.
- Make full and proper use of control measures e.g., using extract ventilation where provided and report any defects.
- Report any defects to plant/equipment immediately to the PI / Supervisor.
- Report any accident or incident which may have resulted in the release of a dangerous chemical / substances into the workplace.

1.5.4 Employees

Employees including part time staff have the following legal duties under Section 13 and 14 of the Safety, Health and Welfare at Work Act 2005:

- Take reasonable care of their own safety, health, and welfare and that of others.
- Ensure they are not under the influence of an intoxicant to the extent that they may endanger themselves or others.
- If reasonably required by their employer to submit to any reasonable test for intoxicants by or under the supervision of a competent person.
- Co-operate with their employer or any other person as appropriate.
- They must not engage in improper conduct or behaviour (including bullying/harassment).
- Attend all necessary training.
- Use safety equipment or clothing provided, or other items provided for their safety, health, and welfare at work.
- Ensure any spillages or leakages are cleaned up immediately.
- Operate machinery and equipment safely and correctly.
- Not put hands or limbs into any part of any machinery or equipment.
- Report to their Supervisor, Manager or Man Health and Safety Co-ordinator as soon as practicable:
 - I. Any work, which may endanger the health and safety of themselves or others.
 - II. Any defect in the place of work, systems of work, articles, or substances.
 - III. Any breach of health and safety legislation of which he or she is aware.
- Employees must not:
 - I. Interfere with, misuse or damage anything provided for securing the health, safety, and welfare of those at work.
 - II. Place anyone at risk in connection with work activities.
 - III. Intentionally or recklessly interfere with or misuse any appliance, or safety equipment provided to secure the safety health or welfare of persons at work.

1.5.5 Students

The University has a duty to ensure the health safety and welfare so far as is reasonably practicable of its students. Students are expected to co-operate by taking proper care for their own health and safety and the safety of others who may be affected by their acts or omissions. Students are expected to follow any instructions in safe practices and procedures and ensure they do not intentionally or recklessly interfere or misuse anything provided in the interest of health safety and welfare. Failure to comply with safe procedures or instructions may result in the commencement of disciplinary procedures by the college.

1.5.6 Visitors

Department staff, who have visitors, are responsible for ensuring that their visitors are aware of all Safety rules are fully aware of local fire evacuation procedures and have been informed of any special risks associated with the area being visited. No visitor who is not technically qualified will be left unattended

in any laboratory. All visitors, contractors and maintenance personnel must comply with the Department and Laboratory Safety Regulations.

1.6 Risk Assessment

All members of the college must carry out a risk assessment where their work has the potential for harm to themselves and others.

All experimental work requires a risk assessment that:

- includes and addresses any potential hazard, including lone working.
- is updated if there is a significant change to experimental equipment or procedures.
- is reviewed and updated annually.
- is signed by the responsible PI/supervisor.

There are 4 basic steps to Risk Assessment.

- **Identify the hazards** – hazards are anything that can cause serious harm
- **Assess risk from these hazards** – the probability of harm occurring and to what degree of severity
- **Determine and implement relevant safety measures** – Your control measures are the most significant part of the risk assessment, as they set out the steps that must be followed to protect yourself and others
- **Assess residual risk** – any risk that remains after all the initial risk assessment is completed, refine control measures to account for this also

Preferably, your risk assessments will be included in a Project Safety Statement. The Project Safety Statement will include but is not limited to the following;

- | | |
|---|--|
| <ul style="list-style-type: none">• Title block• Student & Lab info• Emergency contacts• Overview of project• Registered users form | <ul style="list-style-type: none">• Activity details• SOPs• Safety Data Sheets• Risk Assessments<ul style="list-style-type: none">◦ in 5x5 format |
|---|--|

Some projects may require multiple risk assessments. Completed Project Safety Statements should be uploaded to the Projects SharePoint. Previous examples can be found on SharePoint.

Risk assessment forms and guidance note on completing risk assessments can be found in [Appendix A](#). Risk assessments that may need to be completed include:

- Equipment Risk Assessment
- Chemical Risk Assessment
- Project Safety Statement & Risk Assessment
- Biological Agents Project Risk Assessment
- Lone Working Risk Assessment
- Pregnant Employees Risk Assessment

1.7 New Hazard Safety Document

This document is required for new High-Risk Hazards such as Chemicals, Compressed Gas, Cryogenics, etc. The document should provide an overview of the hazard (why the hazard is required, hazard location, duration the hazard is required for, etc.).

Additionally, an in-depth account of the hazard should include safety information and documentation, MSDS and any additional safety documentation relevant to the hazard. All new hazards will require risk assessments and approval.

1.8 Identified Hazards

1.7.1 MMBE Hazards

Several general hazards have been identified that apply across the Department of Mechanical, Manufacturing and Biomedical Engineering (MMBE) including:

- Fire Hazards
- Workshop Hazards
- Rotating Machinery and Power Tools Hazards
- Electric Shock Hazards
- Arson and Bomb Threats
- Slips, Trips and Falls Hazards
- Work Environment Hazards
- Plant, Equipment and Machinery Hazards
- Chemical Hazards
- Late Night Working
- Overcrowding

Details can be found in [Appendix B](#). Specific Standard Operating Procedures (SOPs) and Risk Assessments will be developed for machinery and equipment used in the department.

1.7.2 TBCE Hazards

It is noted that the Trinity Centre for Biomedical Engineering (TCBE) located at the Trinity Biomedical Sciences Institute (TBSI) building has developed 215 Standard Operating Procedures (SOPs) and Risk Assessments (RAs) including the following:

- 3D Bioprinting SOPs and RAs (Sept 21) – 15 No.
- Biochemical SOPs and RAs (Sept 21) – 17 No.
- Biomaterials SOPs and RAs (Sept 21) – 47 No.
- Cell Culture Cleaning SOP (June 19)
- Cell SOPs and RAs – 31 No.
- Coverslipper SOP and RA
- David Hoey SOPs and RAs – 41 No.
- Deliveries SOP
- General SOPs and RAs – 41 No.
- Histology SOPs and RAs – 28 No.

- Liquid Nitrogen SOP and RA – 1 No.
- Orders SOP
- Sensitive Sample Shipping SOP
- Software SOPs – 4 No.
- Waste Disposal SOP – 1 No.

These SOPs are reviewed annually and updated as necessary.

1.9 Safety Consultation

Trinity College Dublin is committed to a policy of co-operation and consultation between management and staff and will take account of any representations made by staff members. The effectiveness of the consultation arrangements will be reviewed at regular intervals.

MMBE is fully committed to meeting their obligations under *Section 26 of the Safety, Health and Welfare at Work Act 2005* on consultation. Safety Noticeboards are maintained throughout its buildings. The School of Engineering also has quarterly safety committee meetings attended by the School of Engineering Safety Representative. Health and safety issues can also be brought up at local meetings or via the School of Engineering Safety Representative, David Igoe.

For TCBE, Simon Carroll attends the regular Building TBSI Management Group meetings that are held, and minutes are kept. These meetings are attended by the Academic Director, Technical Officers / Safety Officers from Schools and Disciplines present in the TBSI.

1.10 Safety Representatives

Employees may select and appoint a Safety Representative. Safety Representatives will not be placed at any disadvantage as a result of fulfilling their role. Section 25 of the Safety, Health and Welfare at Work Act 2005 states that the Safety Representative may:

- Make representations to their employer on any aspects of safety, health, and welfare at the place of work.
- Inspect the place of work after giving reasonable notice to their employer. The frequency and schedule of inspections must be agreed between the Safety Representative and the employer in advance.
- Inspect the place of work in the event of an accident, dangerous occurrence or a situation of imminent danger or risk to health and safety.
- Investigate accidents and dangerous occurrences provided that they do not interfere with or obstruct any person fulfilling their legal duty.
- After giving reasonable notice to their employer, investigate complaints made by employees whom they represent.
- Accompany a H.S.A. Inspector on a tour of inspection.
- At the discretion of a H.S.A. Inspector, accompany the inspector while they are investigating an accident or dangerous occurrence.

- Make oral or written representations to H.S.A. Inspectors on matters relating to health, safety, and welfare at the place of work.
- Receive advice and information from H.S.A. Inspectors on matters relating to health, safety, and welfare at the place of work.
- Consult and liaise with other Safety Representatives appointed in the organisation.
- Safety Representatives will be given reasonable time off, without loss of remuneration, to discharge their functions as a Safety Representative and to acquire appropriate knowledge and training.

Safety Representatives must be notified when a H.S.A. Inspector visits the site for the purpose of an inspection.

1.11 Auditing & Inspections

The Departmental Safety Officer will implement a Safety Inspection Programme. Safety inspections will be carried out at least once a year and all findings will be brought to the attention of management. Staff and researchers are encouraged to report any safety concerns to their manager or supervisor and the Departmental Safety Officer.

1.11 Disciplinary Action

Where advice and persuasion fail to achieve compliance with safety and health rules, it is the policy of the Department of Mechanical, Manufacturing and Biomedical Engineering to take disciplinary action on the matter.

1.12 Bullying and Harassment

Trinity College Dublin are committed to providing a work environment free of any kind of bullying or harassment. Management at the highest level will not tolerate bullying or harassment and will take appropriate steps to resolve any problems that may occur, which should be reported to their supervisor or in accordance with [University Dignity & Respect Policy](#).

1.13 Stress

Trinity College Dublin adhere to all aspects of the Safety, Health and Welfare at Work Act 2005, which obliges employers to identify and safeguard against all risks to health and safety, including stress. Workplace stress arises when the demands of the job and the working environment on a person exceed their capacity to meet them. Refer to the [Staff Wellbeing](#) webpage for further information.

Section 2 – General Safety Rules

2.1 Emergency

In the event of an incident requiring emergency assistance, the fire/emergency services or medical assistance:

TCD Main Campus

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

Be prepared to state the:

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

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

This number (1999) should only be used in an emergency.

The 24-hour Security Centre is at 1317 (01 896 1317) for non-emergency calls.

Department phone numbers relating to safety can be found here: [MMBE Safety Contacts](#)

Central Security Control Room

Ext 1999 using the nearest telephone or 01 896-1999 if using a mobile phone

Ext 1317 will also contact the Control Room

Front Gate 01 896-3978

TBSI

Attendant Desk: call 01 896 3999 or extn. 3999.

Executive and Technical Director: Tony Byrne: Ext 3964; Mobile 087 9731446

Premises Manager : Patricia Ryan : Ext 4339 ; Mobile 087 2512362

Trinity Central (Commercial side): Michael Flanagan (Colliers) phone 087 254 1442.

Trinity Central Security Desk – 086 045 3299

2.2 General Safety Action

When you enter a building in the University, MMBE or otherwise:

- Find out how to get out in an emergency.
- Know the location of the emergency evacuation assembly point.
- Look for the fire safety equipment.
- Know where the nearest alarm call point is.
- Read the hazard information signs (fire, first aid, chemical, biological, radiation, laser etc.).

2.3 Fire Action

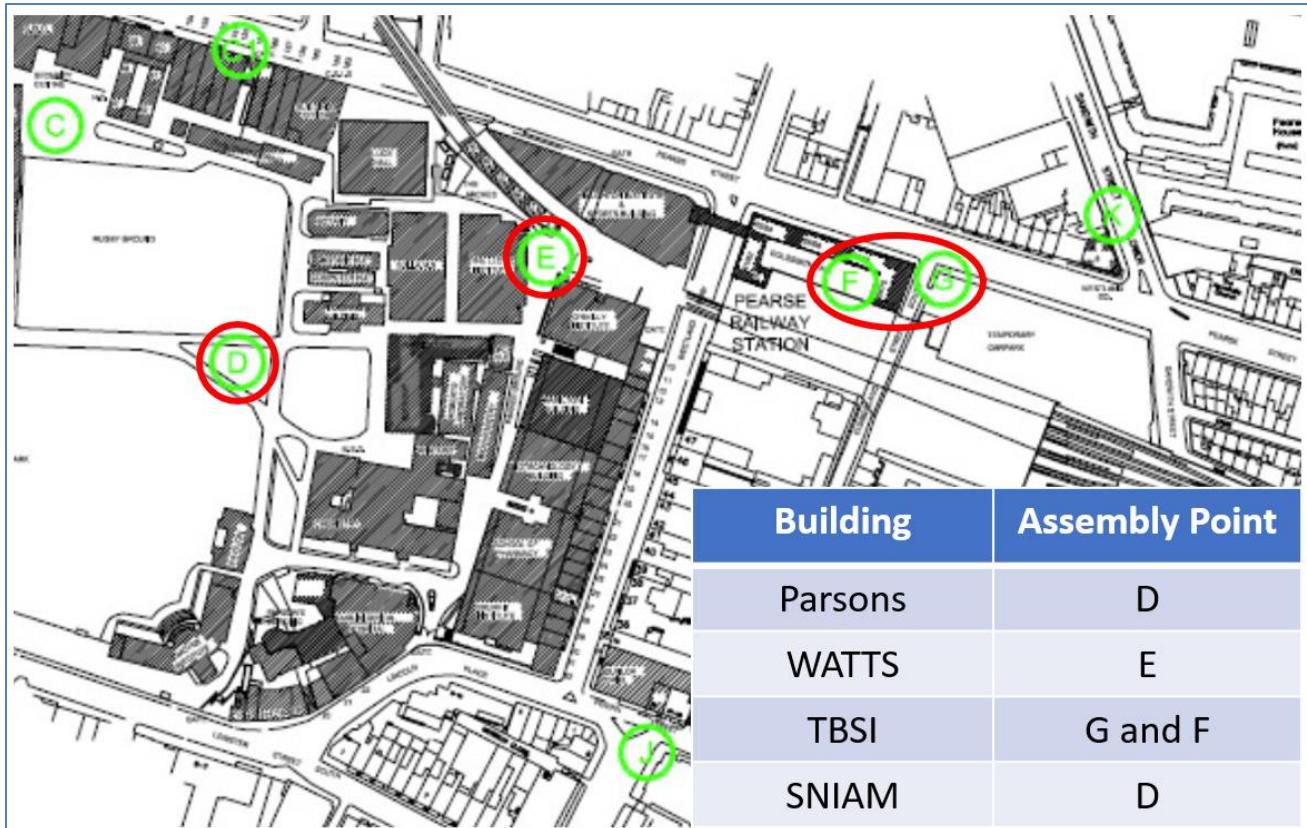
What to do if you discover a fire:

- Raise the alarm at the nearest break glass unit or alarm call point.
- Leave your building immediately using the nearest exit route.
- Do not use lifts.
- Close doors behind you as you leave.
- Do not take risks.
- Notify Security at 1999 or mobile 01 896 1999, informing them that the alarm has been raised and in which area. TBSI numbers are: 3999 or 01 8963999.
- Notify a Fire Warden of your findings if there is one outside the building.
- Report to your designated Assembly Point, do not congregate at the building entrance.
 - **Parsons Building & SNIAM** **Point D**
 - Grass triangle ('Flat Iron') at east end of Boardwalk (College Park).
 - **WATTS** **Point E**
 - Between the Lloyd and O'Reilly Buildings, near the Arches.
 - **TBSI** **Points G and F**
 - To the sides of the Institute on Cumberland St South and Sandwich Street.
 - **Stack B** **Tree Garden**
 - To the front (north side) of the building.

What to do if the fire alarm sounds

- Obey, promptly, all instructions given by the Fire Wardens/Safety Officer.
- Leave your building immediately using the nearest exit route.
- Do not use lifts.
- Close doors behind you as you leave.
- Do not take risks.
- Move away from the building.
- Report to your designated Assembly Point, do not congregate at the building entrance.
- Do not re-enter building for any reason until authorised to do so and fire alarm is switched off.

2.4 Fire Assembly Points for MMBE



2.5 Fire drills

Fire drills are held annually 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.

2.6 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.

2.6 Fire wardens

The Fire wardens for the Department are:

- Parsons Building
 - Ms. Judith Lee (Tel: 1383 or 01-896 1383)
 - Dr. Conor McGinn (Tel: 4582 or 01-896 4582)
 - Dr. Seamus O'Shaughnessy (Tel: 1778 or 01-896 1778)
 - Mr. Alex Kearns (Tel: 1463 or 01-896 1463)
 - Mr. Gerry Byrne (Tel: 3523 or 01-896 3523)
 - Mr. Robert Dunbar (Tel: 1854 or 01-896 1854)
 - Mr. Gordon O'Brien (Tel: 2396 or 01-896 2396)
- MMBE labs in TBSI
 - Dr. Simon Carroll (Tel: 087 9233004)
- WATTS Building
 - Dr. Daniel Trimble (Tel: 4856 or 01-896 4856)

2.7 First Aid

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. For serious injuries during normal office hour's emergency medical attention can be obtained from the University Health Services by contacting Ext. 1556.

Updated lists of first aiders in the Department are located near first aid boxes installed throughout the Department. Make sure to familiarise with the location of the nearest first aid box.

Should the local first aiders be unavailable then the emergency services can be contacted on Ext. 1999 for the Main campus or 3999 for the TBSI building.

The table below and the following paragraphs which qualify it, gives a broad indication of the type of first aid equipment, and supplies which should be provided, be conveniently located, and kept up to date as outlined in the H.S.A. Guide to Safety, Health and Welfare at Work (General Application) Regulations 2007 Chapter 2 of Part 7 First Aid.

Table 1 Recommended Contents of First Aid Boxes and Kits

Materials	First-aid Travel kit	First-aid box		
		1 - 5 persons	6 - 25 persons	26 - 50 persons *
Adhesive Plasters	20	20	20	40
Sterile Eye Pads (Bandage attached)	2	2	2	4

Materials	First-aid Travel kit	First-aid box		
		1 - 5 persons	6 - 25 persons	26 - 50 persons *
Individually Wrapped Triangular Bandages	2	2	6	6
Safety Pins	6	6	6	6
Individually Wrapped Sterile Unmedicated Wound Dressings Medium (No. 8) (10 x 8cm)	1	2	2	4
Individually Wrapped Sterile Unmedicated Wound Dressings Large (No. 9) (13 x 9cm)	1	2	6	8
Individually Wrapped Sterile Unmedicated Wound Dressings Extra Large (No. 3)(28 x 17.5 cm)	1-	2	3	4
Disinfectant Wipes	10	10	20	40
Paramedic Shears	1	1	1	1
Pairs of Examination Gloves	3	5	10	10
Sterile water where there is no clear running water ** 2	2x20 mls	1x500 mls	2x500mls	2x500mls
Pocket Face Mask	1	1	1	1
Water Based Burns Dressing Small (10 x 10 cm) *** 3	1	1	1	1
Water Based Burns Dressing Large *** 3	1	1	1	1
Crepe Bandage (7cm)	1	1	2	3

* **Note 1:** Where more than 50 persons are employed, pro rata provision should be made.

** **Note 2:** Where mains tap water is not readily available for eye irrigation, sterile water or sterile normal saline (0.9%) in sealed disposable containers should be provided. Each container should hold at least 20ml and should be discarded once the seal is broken. Eye bath/eye cups/refillable containers should not be used for eye irrigation due to the risk of cross infection. The container should be CE marked.

*** **Note 3:** Where mains tap water is not readily available for cooling burnt area.

2.8 First Aid Boxes

First aid boxes will be maintained by the MMBE 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 MMBE Chief Technical Officer.

2.9 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.

2.10 Reporting Accidents, Incidents and Dangerous Occurrences

All accidents and near misses (incidents that could have led to a serious injury) must be immediately reported to the laboratory or research supervisor and the local safety officer. The official University Accident/Incident form on [iProtect U](#) should be completed, as soon as it is practicable to do so, after the accident occurs in accordance with University procedures.

The points of contact for incident reporting are:

MMBE Safety Officer – Gordon O'Brien gordon.obrien@tcd.ie

TBSI Safety Officer – Simon Carroll simon.carroll@tcd.ie

All accidents and incidents reported on [iProtect U](#) will be sent to the Head of Safety at Trinity College, who will notify the Health and Safety Authority (H.S.A.) and carry out an accident investigation in accordance with college protocols.

2.11 Reporting of Hazards

All personnel using Departmental buildings have an individual responsibility to report, directly to the Departmental Safety Officer or MMBE 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 Departmental Safety Officer.

2.12 Access to Parsons

The normal working hours for the Department are 8am to 5pm, Monday to Friday. **Outside of MMBE normal working hours, the use of SafeZone app is mandatory.** Extended hours for the Department are 5pm to 10pm, Monday to Friday and 10am to 4pm Saturday and Sunday. There will be no access to Parsons Building outside of these hours.

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 normal working 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 and from the Department Safety Officer.

2.13 After Hours Working

It is now compulsory to use the SafeZone App while in MMBE labs or offices outside of normal working hours.

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 and should apply for Lone Working approval.

Please download the SafeZone app and see the University lone working policy and the MMBE Protocol for After Hours Working [Appendix D](#).

2.14 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.

2.15 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.

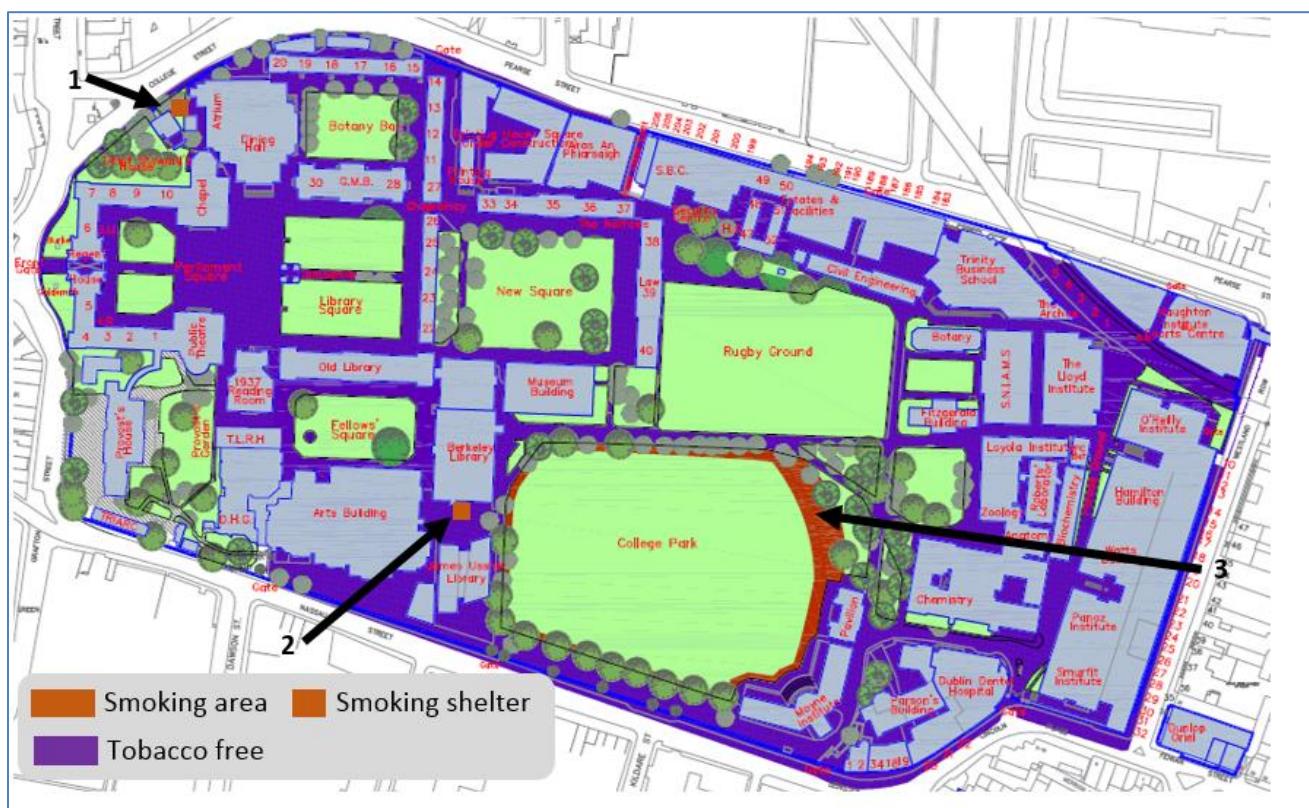
2.16 Electrical Switch Rooms/Plant Rooms

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

2.17 Smoking, Vaping and E-cigarettes

Trinity is a tobacco free campus with three exceptions as per the map below.

The use of E-cigarettes / Vaping is also prohibited within the Department of Mechanical and Manufacturing Engineering, 4m from entrance doors, opening windows and entrances to enclosed areas.



2.18 Out of hours event management

All out of hours events being organised in the Department are only to be done following completion of an Event Management Plan. Among other things this must consider the following:

- The capacity of the venue
- The numbers expected
- Crowd management
- Fire safety & evacuation of the building
- Names of people in charge/stewards

For out of hours non-MMBE use of Department facilities (lecture theatres, rooms etc.), bookings will only be accepted when accompanied by the appropriate event management plan. Full details along with event plan templates/checklists are available from the University Safety Office under [Event Safety](#).

2.19 Travelling for work

The college provides a business travel insurance scheme with cover only being provided once the journey is authorised via the Head of Department and a travel insurance form has been completed and returned to the estates and facilities department prior to the start of the journey.

This may be done on-line at Estates and Facilities [Shared Admin and Support - Insurance](#) (you'll need to have your username & login password registered at TCD Portal- [Trinity Web Systems](#)). Alternatively, a hard copy may be printed out and returned to the Estates and Facilities Department.

Section 3 – Safety rules for Teaching Labs & Lecture Theatres

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 [Section 2](#) of this document. The following rules apply specifically to personnel (including staff, demonstrators, and undergraduate students) who are authorised to enter and work in the teaching laboratories and lecture theatres of the Department.

3.1 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 in the [Health & Safety Training](#) section of the University Safety Office website.

3.2 General laboratory rules

- All students must read and abide by the Safety Statement issued by the Department of Mechanical, Manufacturing and Biomedical Engineering, TCD.
- Smoking, Vaping and the use of E-Cigarettes is not permitted in college buildings.
- Eating and drinking is not permitted in laboratories and lecture theatres.
- Guidance for the use of hazardous equipment, materials, and procedures (such as lasers, chemicals, or electrical equipment for example) may be found in [Section 5](#) of this document- Designated Safety Areas.
- 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 4 – 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 [Section 2](#) 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 within the Department.

Additional rules apply for personnel working in MMBE labs within TBSI.

4.1 Responsibility

Overall responsibility for health and safety within the Department rests with the Head of Department. The extent of supervision required depends on the risks involved and the ability of the worker to identify and handle safety and health issues.

Workers, undergoing training, doing a job which presents special risks, or dealing with new situations may need to be accompanied at first. The level of supervision required is a management decision, which should be based on the findings of risk assessment, i.e., the higher the risk, the greater the level of supervision required.

It should not be left to individuals to decide whether they require assistance. 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 MMBE workers have a responsibility not to endanger themselves and others by their actions or omissions.

4.2 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. Designated Safety Areas are outlined in [Section 5](#).

4.3 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.

4.4 General Laboratory Practice

- 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.
- All experimental systems should be designed to be fail-safe.
- 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 A](#)) and provide appropriate written work instructions and additional written local safety rules where necessary. 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 copy of the risk assessment should be lodged with the Departmental Safety Officer. If in any doubt consult the appropriate safety consultant.
- 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.
- Researchers must not attempt new procedures or tasks without consulting their supervisor and receiving appropriate safety training.
- 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.
- Always be vigilant in the need to prevent a fire from occurring in regard to the use of chemicals or electrical equipment (details provided in chemical section). Please make a note of the nearest fire exits so that if a fire breaks out you know how to get out.
- Note the location and method of operation of fire blankets and fire extinguishers. Do not use fire extinguishers unless you have been trained in their use.
- In some research laboratories oxygen monitor alarms are present to indicate if low oxygen levels are present in the laboratory. If the alarm sounds **DO NOT ENTER** and inform a member of staff immediately. If the alarm is switched off inform a member of staff immediately so it can be re-calibrated for future use.

4.5 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.

4.6 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 IV form ([Appendix E](#)) 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.

4.7 Shared Offices

Those who operate co-working spaces have a duty to ensure that, so far as is reasonably practicable, the space and any equipment provided within it is safe. Electrical equipment such as toasters and blow heaters and 3D printers are not permitted in shared offices. Walkways should remain clear of any obstructions at all times.

Section 5 – Safety Designated Safety Areas

In several designated safety areas, for which either procedures are dictated by statutory provisions or where inherent hazards exist due to the nature of such work, explicit safety training is provided for researchers within the School. In these areas, designated safety consultants identify hazards, evaluate risks, and provide appropriate specialist safety advice. Specific safety rules and procedures apply in these designated areas. These are detailed below:

5.1 TBSI Safety

Safety Officer for MMBE/TCBE labs and offices in TBSI - Dr. Simon Carroll (Ext. 8503)

All new members of Trinity Centre for Biomedical Engineering (TCBE) should access [TCBE SharePoint](#) and review the TCBE Welcome Document ([Appendix F](#)) for important information regarding Induction, Health & Safety, Lab Access, SOPs etc. 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. Contact [Dr. Simon Carroll](#) for access to TCBE SharePoint.

5.2 Mechanical Safety

Mechanical Safety consultation - Chief Technical Officer, Mr. Michael Reilly (Ext.1557)

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 MMBE 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)

5.3 Compressed Gas Safety

Compressed Gas Safety consultation - Chief Technical Officer, Mr. Michael Reilly (Ext.1557)

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. 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.
2. All compressed gas cylinders require a compressed gas permit.
3. All users of compressed gases must be fully familiar with the appropriate manufacturer's identification codes and cylinder configurations.
4. Never remove or deface cylinder identification.
5. Store cylinders vertically and clamp securely to prevent toppling. Cylinders must not be left free standing at any time.
6. Store in a well-ventilated area away from any fire risk.
7. Valves should be closed, and valve outlets plugged or blanked. Valve guards or caps should be securely fitted.
8. Separate cylinders of flammable gases from those of oxygen or oxidants by at least 3m.
9. 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.

10. Where possible pipe gases from a secure location outside the laboratory.
11. 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.
12. A "Compressed gas cylinder in use" form (Appendix G), 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 G) must also be displayed.
13. In rooms where flammable or other hazardous gases are in use, appropriate signage must be displayed on the room entrances.
14. Always use the appropriate trolley to move heavy cylinders.
15. Only suitably equipped and trained personnel may move gas cylinders + fit regulators.
16. Gas cylinders should not be transported in occupied lifts.
17. Use only approved regulators. Check their suitability for the gas in use.
18. It is recommended that regulators are either replaced or refurbished after (at maximum) 5 years from date of purchase.
19. 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.
20. Never transfer gas from one cylinder to another.
21. Report all faulty cylinder valves and regulators immediately to the MMBE Chief Technical Officer.
22. 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.
23. All compressed cylinder gases should be ordered through the MMBE 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 G](#) 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***'.

5.4 Chemical Safety

Chemical safety consultation - Mr. Robert Dunbar (Ext: 1854)

The Chemicals Safety Act 2008 and 2010 ensures that the use of hazardous chemicals in the workplace is controlled in a safe manner via EU regulations. As a result, the School via its principal investigators and supervisors is responsible for the following:

- Assess the risks that arise from the hazardous substances in the workplace and to identify and provide effective controls to minimize risks and protect people's health
- Ensure that the controls are properly used and maintained in effective working order
- Provide training and information for those who may be affected or exposed
- Monitor exposure and implement health surveillance where necessary
- Provide a list of flammable chemicals used by their research group (approx. quantity and location) to the Department Safety Officer and Chemical Safety Rep. For safety reasons and following University procedures, a sign indicating the presence of flammable chemicals must be available at the door of the laboratory.

Researchers and any other lab users are responsible for observing safe chemical handling and storing protocols.

A copy of the most recent regulations can be found at:

[Chemicals Act 2008 \(No. 13 of 2008\) and Chemicals \(Amendment\) Act 2010 \(No 32 of 2010\)](#)

The following rules and regulations apply to the use of chemicals in the building:

- All chemicals need to be recorded in LabCup along with their locations.
- When ordered online, all chemicals must be risk assessed and logged via the Research Supervisor and Safety form to ensure correct use and hazard control.
- Hazardous substances or chemicals may only be procured through a PI or the MMBE Chief Technical Officer on foot of a signed requisition from the research supervisor.
- Upon arrival onsite, ALL chemicals must be logged via the LabCup system by the researcher who order the chemical via the barcoding system. See [TCD LabCup](#) for access and registration details.
- This system allows access to the relevant safety data sheets for each chemical which should be read for each chemical before use. 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.
- 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.
- A copy of Risk Assessments must be kept by PI and one lodged with the Departmental Safety officer.
- All work involving chemicals should involve the use of personal protective equipment such as appropriate gloves, lab coat and safety goggles

- If the chemical requires the use/operation within a fume hood, please ensure space is made available for your and/or peoples experiments.
- Please ensure all chemicals are stored in the correct shelves/fire-safe presses. i.e. acids and bases should never be mixed
- All chemicals transferred to a new/other container must be clearly labelled with the name and any relevant hazard symbols associated with its use. A LabCup barcode should also be used for the new container.
- Any chemical spills must be contained immediately via the Chemical spill kit which are available on each floor. Please inform a member of staff if such a spill occurs so a replacement spill kit can be ordered and disposed of correctly.
- All chemicals must be disposed of via Chlorinated and Non-Chlorinated containers shown below. They can be disposed of via the Hazardous Materials Facility (HMF) in the basement in TBSI. Containers must be not more than two-thirds full when sent to the HMF.
- Acid waste should be disposed of via separate safety containers.
- All broken glass must be disposed of via ‘Sharps’ bins which are shown below. This includes contaminated glass, used needles/syringes, scalpels/blades and broken instruments which are sharp.
- Suitable bottle carriers must be used when transporting Winchester and Eurobottle containers in order to prevent accidental spillage or personal injury
- All cytotoxic waste should be disposed of in a Cytotoxic waste bin which have a yellow base and purple lid which are shown below.
- When a chemical container becomes empty/used up please inform a Technician or Laboratory attendant, so they can be logged off the LabCup system.
- For any further relevant information on chemical safety required please contact your local technician or see the college guidelines at: [Chemical Safety](#)
- For any chemical safety requirements, ordering details, disposal times and costs please contact the HMF facility at: [Hazardous Materials](#)
- For further chemical data or regulatory E.U. control measures please see the [REACH](#) website

Chemical Waste



Chlorinated/Non-Chlorinated Solvent Waste



Chemically Contaminated Waste



Hazardous Liquid Disposal (e.g., Acids)



Clinical Waste bin



Chemical Spill Kit



Cytotoxic Clinical waste bin

5.5 Electrical Safety

Electrical safety consultation – Mr. Paul Normoyle (Ext: 1332)

In Ireland single-phase mains electricity is 230V rms, 3-wire (Live, Neutral, and protective Earth). Three-phase 400V supply is used with some larger equipment such as fans and pumps. Fuses provide over-current protection only. RCD's (residual current devices) protect life by detecting milliampere fault currents to earth, and typically disconnect the mains supply in milliseconds. Using electricity is normally very safe, but be aware that electricity can cause fire, serious injury and even death. Research supervisors and persons in charge of research laboratories have a responsibility to ensure that new or visiting research staff have received appropriate safety training before authorisation of access to research areas, and that good general working practices prevail within their research laboratory.

General guidelines:

- Switch-off and unplug equipment when no longer in use.
- Routinely check for damaged plugs and cables.
- Have a technical staff member check over unfamiliar/new equipment before plug-in.
- Extension sockets should be off the ground in case of leaks/spills.
- Extension or cable reels should never be left plugged-in unattended.
- Mains isolation switches must be kept unobstructed.
- Constructed mains-powered electrical/electronic equipment must be fused, and metal enclosures must be securely earthed. No live part should be accessible without the use of a tool.
- Know that batteries can deliver dangerously high short-circuit currents.
- Autotransformers / Variacs do not provide isolation and should not be used.
- High Voltage (i.e., kV) apparatus requires special safety precautions.
- Experiments involving electrical equipment which operate overnight must be designed to be inherently **fail-safe** and be capable of safe shut down via the mains isolation switch.
- **Remote access:** If an experimental set up is controlled remotely an Unattended Apparatus Form must be completed, and a copy posted at the equipment.

Electrical emergency: Pull the plug or use the mains isolation switch.

5.6 Laser Safety

Laser safety consultation – Dr. Tim Persoons (Ext:1936)

All research supervisors and persons in charge have a responsibility to ensure that:

1. All lasers under their control are entered in the University laser register held by the University Laser Safety Officer
2. All new or visiting research staff are registered as designated laser workers and receive the appropriate level of laser safety training before access to laser areas is authorised
3. All relevant safety precautions have been met
4. Appropriate eye protection should be made available to each user
5. Each user must attend the annual Laser Safety training day- For details contact the University Laser Safety Officer, [Mr. Christopher Smith](#) Ext. 3649

Postgraduate workers must satisfy their supervisors 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.

If a laser safety course is unavailable, complete the online part of the course hosted on Blackboard. This will give you preliminary registration as a laser user in the college. You can work with lasers in the college as long as you are trained and supervised by a registered expert user. Log into Blackboard, self-enrol on the laser safety module there, study the notes and complete the test.

Further information is available at [Laser Safety](#).

5.7 Radiological Safety

Radiological safety consultation – Mr. Robert Dunbar (Ext: 1854)

Before considering working with ionising radiation, you should firstly ask yourself the following questions:

- Do I need to use ionising radiation to undertake this work? (Are there any safer alternatives that can be used?)
- Can I justify the use of ionising radiation to undertake this work? (Will the benefits arising from the use of ionising radiation in this work outweigh any potential risks?)
- Are the amounts, quantities, concentration and activities of ionising radiation which I intend to use absolutely necessary to enable the proposed work to be undertaken? (Legally the activity of ionising radiation used and the subsequent doses which may result, must be as low as reasonably achievable, this is known as the ALARA principle).
- Can I ensure that the dose rates resulting during the course of my work will not exceed legal limits?

Unless you can answer 'Yes' to each of these 4 questions, you will not be given authorisation to work with ionising radiation, as these are fundamental legal principles which must be complied with. Working with ionising radiation in the University is on a permit to work basis. Only authorised personnel are entitled to work with ionising radiation. If you intend to work with either radioactive materials (RAM), whether these are sealed or unsealed sources, or with irradiating apparatus, you must first register with the Departmental Radiological Protection Supervisor (DRPS), Mr. Robert Dunbar.

Further information is available at Radiological Safety section of [Safety Office](#) website.

5.8 Biological safety

Biological safety consultation – Dr. Simon Carroll (Ext: 1854)

Work involving biological samples must comply with the provisions of the SAFETY, HEALTH AND WELFARE AT WORK (BIOLOGICAL AGENTS) REGULATIONS 2013 and the College biological hazards policy.

Any proposed projects, that may at some stage involve the use of biological samples either within MMBE or by MMBE personnel on projects outside the Department, should be discussed with the College Biological Safety Officer at an early stage. Both a Biohazards Project Registration Form and a Biohazards Personnel Registration Form must be completed and submitted to the College Biohazard Officer. Further information is available at [Biological Safety](#).

5.9 Cryogenic Liquid Safety

The most common cryogenic hazard found in the laboratories is liquid Nitrogen (boiling point -196°C). Those wishing to use liquid nitrogen must have attended the course 'Safe use of Cryogenics' organised by the safety Office.

The use and handling of cryogenic liquids necessitates the following rules/guidelines:

- Apron, eye protection and thermal gloves when transferring liquids
- A full risk assessment must be used before carrying out any experiment signed via your Principle Investigator
- Ensure adequate ventilation is available in the laboratory of use before carrying out any experiment in-case of inert gas asphyxiation
- In the event of spill or oxygen monitor alarm sounding please evacuate the laboratory immediately and inform a member of staff to assess the situation.
- No-one may travel in lifts with dewars containing liquid nitrogen

For further detailed information please see the [University Cryogenic Safety Guidelines](#)

5.10 Visual Display Unit (VDU) Safety Assessment

VDU Safety consultation – Ms. Judith Lee (julee@tcd.ie)

The [University VDU Policy](#) guidelines apply mainly to each employee who ‘habitually uses display screen equipment as a significant part of his normal work’ (e.g. for more than 1 continuous hour per day, every day) They should be interpreted in a common sense way in the case of occasional and short term users and non-employees.

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.

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.

5.11 Dignity and Respect Policy

The Department of Mechanical, Manufacturing and Biomedical Engineering is committed to creating an environment where every employee and student is treated with dignity and respect. The University promotes, and is committed to supporting, a collegiate environment for its staff, students and other community members, which is free from discrimination, bullying, sexual harassment, excess stress and other forms of harassment. If you feel affected by any of these issues please contact your class representative, research supervisor or line manager directly. For more detailed information, standard procedures and contact details please see the [University Dignity and Respect Policy](#)

5.12 General Information

Should you have any queries/updates on this Health and Safety Policy please contact the Department Safety Officer [Mr. Gordon O'Brien](#) to make any changes/recommendations.

For the University Health and Safety guidelines/advice please visit [The University Safety Office](#)

For current up to date Health and Safety Guidelines please see [The National Health and Safety Authority](#)

5.13 Storage of training records/risk assessments

All risk assessment forms and standard operational procedures should be available in the labs for consultation by staff and students, reviewed annually and stored with the Safety Officer for reference and review. All training records for Academic, Technical, administrative and research staff and students should be updated at least annually and stored with the school administrator for review via head of department.

Section 6 – Important Safety Contacts

Title/Function	Present Holder	Email	Phone
Emergency	University Security		1999
First Aid Personnel	Mr. Michael Reilly	mireilly@tcd.ie	1557
	Mr. Alex Kearns	kearnsal@tcd.ie	1463
Head of Department	Prof. Ciaran Simms	csimms@tcd.ie	3768
MMBE Chief Technical Officer	Mr. Michael Reilly	mireilly@tcd.ie	1557
Department Safety Officer	Mr. Gordon O'Brien	Gordon.obrien@tcd.ie	2396
School Safety Officer	Dr. David Igoe	igoed@tcd.ie	3805
MMBE Specialist Safety Areas			
VDU Safety	Ms. Judith Lee	julee@tcd.ie	1383
Laser Safety	Dr. Tim Persoons	Tim.persoons@tcd.ie	1936
Chemical Safety	Mr. Robert Dunbar	dunbarro@tcd.ie	1854
Radiation Safety			
Biohazards Safety	Dr. Simon Carroll	Scarrol6@tcd.ie	8503
Electrical Safety	Mr. Paul Normoyle	paul.normoyle@tcd.ie	1332
Compressed Gas Safety	Mr. Michael Reilly	mireilly@tcd.ie	1557
Mechanical Safety			
Thermo Lab Safety	Mr. Gerry Byrne	gerbyrne@tcd.ie	3523
STAM Labs Safety	Dr. Garret O'Donnell	odonnege@tcd.ie	1184
Design Loft Safety	Dr. Conor McGuinn	mcginnco@tcd.ie	3767
Fire Wardens	Ms. Judith Lee	julee@tcd.ie	1383
	Dr. Daniel Trimble	dtrimble@tcd.ie	4856
	Dr. Seamus O'Shaughnessy	oshaugse@tcd.ie	1778
	Mr. Gerry Byrne	gerbyrne@tcd.ie	3523
	Mr. Alex Kearns	kearnsal@tcd.ie	1463
	Mr. Robert Dunbar	dunbarro@tcd.ie	1854
	Mr. Gordon O'Brien	gordon.obrien@tcd.ie	2396
University Safety Officers		https://www.tcd.ie/safetyoffice/	
Head of Safety	Dr. Katherine Murray	Katherine.murray@tcd.ie	1914
Biological Hazards	Dr. Mary McDonnell	mmcconnal8@tcd.ie	3965
Radiation Protection	Dr. Gillian Gunning	gillian.gunning@tcd.ie	2877
Fire Safety	Mr. Cathal Ryan	cathal.ryan@tcd.ie	3545
Safety Training	Safety Office	safetyoffice@tcd.ie	4000
Additional University Contacts			
Head of Security	Mr. Michael Murray	Michael.murray@tcd.ie	2648
University Health Service	https://www.tcd.ie/collegehealth/		1591 1556

Section 7 Acknowledgement Forms

Online MS Forms versions of the Acknowledgement Forms are preferred. A restricted access spreadsheet will be held by the Department. Only the Head of Department, Department Safety Officer and MMBE Chief Technical Officer will have access to this information.

- A. [MMBE STUDENT ACKNOWLEDGEMENT FORM](#)
- B. [MMBE STAFF ACKNOWLEDGEMENT FORM](#)

Appendices

The Appendix files for this document are located on the MMBE SharePoint [Safety Section](#).

- A. [RISK ASSESSMENTS](#)
- B. [MMBE IDENTIFIED HAZARDS](#)
- C. [INCIDENT/ACCIDENT REPORT](#) (STAFF)
- D. [LONE WORKING](#)
- E. [UNATTENDED APPARATUS FORM](#)
- F. [TBSI WELCOME DOCUMENT](#)
- G. [COMPRESSED GAS SAFETY AN FORMS](#)