

# Safety Statement

for

## Electronic and Electrical Engineering in the School of Engineering, TCD.

<https://www.tcd.ie/eleceng/>



Faculties and Schools Courses Research A-Z

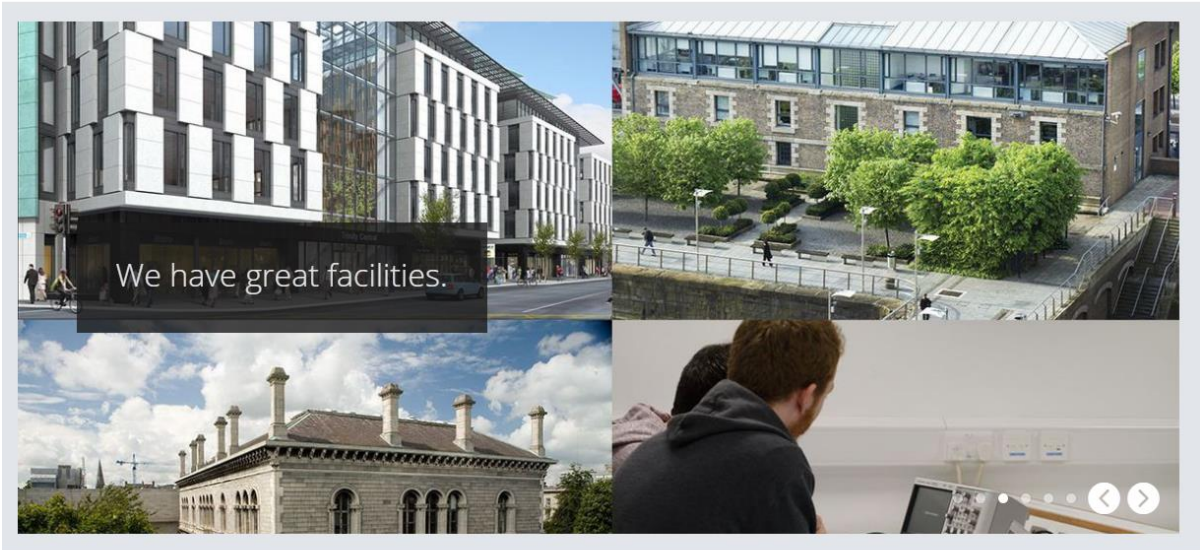
Search Electronic & Electrical Engineering



Electronic & Electrical Engineering

Menu Home About Courses Research People Contact

Gaeilge



Signed  (Head of Discipline)

Prepared by Cormac Molloy (EEE. Safety Officer)

Date 01-September-2024

## Contents

INTRODUCTION.....	4
What is a Safety Statement?.....	4
EMERGENCY DETAILS.....	4
Discipline Numbers Relating to Safety.....	5
FIRE PROCEDURE.....	5
In the Event of Fire.....	5
On Hearing the Fire Alarm .....	5
Fire Alarm.....	6
Emergency Signs .....	6
Fire Assembly Points .....	6
Fire Wardens.....	7
FIRST AID.....	8
First Aid Personnel .....	9
Electrical Emergency Response .....	9
HEALTH & SAFETY POLICY .....	10
Objectives .....	10
Safety Statement .....	10
Health and Safety Legislation.....	11
ORGANISATION & RESPONSIBILITIES.....	12
Organisation.....	12
Responsibilities .....	12
Head of the Discipline .....	12
All Members of Staff .....	13
EEE Safety Officer.....	13
Teaching Staff.....	14
Technical and Administrative Support Staff .....	14
Students .....	14
Visitors and Contractors .....	15
HEALTH AND SAFETY ARRANGEMENTS .....	15
Fire Safety .....	15
Fire Alarm and Evacuation Procedures.....	16
Fire Drills .....	16

Firefighting equipment .....	16
Smoking.....	16
Accident or Incident Reporting .....	16
Work-Related Stress .....	17
Pregnant Employees .....	17
Lone Working or Out-of-Hours Working.....	17
GENERAL SAFETY RULES AND PRECAUTIONS .....	18
Fire Safety in Offices and Laboratories .....	18
Handling Hazardous Substances.....	19
Handling Gases.....	19
Compressed Gases, Gases, and Empty Cylinders.....	19
Handling Chemicals.....	20
Safety Data Sheets .....	21
REACH .....	22
Spills and Disposing of Chemicals .....	22
Storage and Labelling of Chemicals .....	22
Fume Cupboard.....	22
Electrical Safety in Laboratories.....	22
Laser Safety .....	24
Manual Handling.....	25
Noise .....	25
Use of headphones .....	25
Loudspeakers .....	25
VDU Safety .....	26
RISK ASSESSMENTS .....	26
Area: SNIAM.....	27
SNIAM Area: Microelectronics Technology Laboratory (MTL) .....	28
SNIAM Area: Advanced Electronic Materials Laboratory .....	28
SNIAM Area: Research Seminar and Computer Room .....	28
Area: Áras an Phiarsaigh (AAP) .....	28
Area: Stack B (IFSC) .....	28

## INTRODUCTION

### What is a Safety Statement?

A Safety Statement is an organization's written programme for safeguarding the health and safety of its employees. It represents the employer's commitment to health and safety and should state how employees' health and safety shall be secured and managed. It states what necessary safety equipment and procedures will be provided to protect and prevent accidents and ill health in the workplace, complying with the Safety, Health & Welfare at Work Act, 2005.

This Safety Statement is a legal requirement as per Section 20 of the Act and it specifies how the health and safety of all staff, students, and visitors to the Electronic and Electrical Engineering Discipline within the School of Engineering TCD, will be managed and secured as far as is reasonably practicable. It specifies:

1. the hazards identified and the risks assessed
2. the protective and preventive measures taken, and the resources provided for protecting safety, health and welfare
3. the plans and procedures to be followed and the measures to be taken in the event of an emergency
4. the duties of staff in matters relating to safety, health and welfare
5. the names of those appointed for certain health and safety monitoring activities in Electronic and Electrical Engineering (EEE)
6. the names of any safety representatives or members, if any, of a safety committee.

This Safety Statement supplements the College Safety Statement and College Policies, which are accessible on the web at:

<https://www.tcd.ie/safetyoffice/assets/pdf/TCD-Framework-Safety-Statement.Rev.3.0.pdf>

## EMERGENCY DETAILS

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

For **Rescue** or **Emergency Services** contact **College Security Centre**:  
Phone: **1999 (01-896-1999)**

Fire, Garda, Ambulance, Gas Leak, Chemical Spill or Personal Safety  
Phone: **1999**

Student Health Service (office hours), House 47:  
Phone: **1591** or **1556**  
Website: [www.tcd.ie/collegehealth](http://www.tcd.ie/collegehealth)

The following information must be provided:

1. Type of assistance required e.g. Ambulance, Fire Brigade, and Police etc.
2. Details of emergency e.g. Fire, Injury etc.
3. Your name, extension number and location.

If possible and safe to do so, please keep close to the telephone, in order to give further information should it be required by the emergency services. Under no circumstances hang up unless directed to do so by the emergency services.

See also: <https://www.tcd.ie/safetyoffice/emergency-procedures/>

#### Discipline Numbers Relating to Safety

Head of Discipline	Dr. Nicola Marchetti	2900
EEE Safety Officer	Mr. Cormac Molloy	2288
Chief Technical Officer	Mr. Shane Hunt	1865
SNIAM MTL Laboratory	Dr Tania Perova	1432
SNIAM Advanced Materials Lab	Prof. Jagdish Vij	1431
Stack B	Dr. Enda Bates	2253

## FIRE PROCEDURE

### In the Event of Fire

1. **RAISE THE ALARM** – find the nearest break glass unit and press the button
2. **NOTIFY** Security Centre: Phone: **1999**
3. **SWITCH OFF** any equipment
4. **CLOSE** doors behind you
5. **LEAVE** the building **as quickly and safely as possible**
6. **DO NOT USE LIFTS**
7. **PROCEED** to your assembly point-see under.

### On Hearing the Fire Alarm

1. **SWITCH OFF** any equipment
2. **CLOSE** doors behind you
3. **LEAVE** the building **as quickly and safely as possible**
4. **DO NOT USE LIFTS**
5. **PROCEED** to your assembly point

You should know **where** the **EXITS** from your building are located. You should know **where** the **ALARM** buttons are located: - in corridors and labs.

**DO NOT CONGREGATE IMMEDIATELY OUTSIDE THE ENTRANCE TO THE BUILDING.**

**DO NOT RETURN TO THE BUILDING FOR ANY REASON UNTIL AUTHORISED TO DO SO BY THE SENIOR FIRE OFFICER OR OTHER AUTHORISED PERSON AND UNTIL THE FIRE ALARM HAS BEEN SWITCHED OFF.**

**DO NOT TAKE ANY PERSONAL RISKS.**

**DO NOT USE FIRE EXTINGUISHERS UNLESS TRAINED TO DO SO.**

### Fire Alarm

The fire alarm sound is a continuous ringing bell.

### Emergency Signs

Chapter 1 of Part 7 and Schedule 9 to the Safety, Health and Welfare at Work (General Application) Regulations 2007 states the requirements relating to the provision of Safety Signs at Places of Work including provision of safety signs, information and instruction for employees.

Also, the Health & Safety Authority (HSA) provides a guide on obligatory signs to be used at places of work. See the EEE. safety web pages or publications at the Health and Safety Authority:

[https://www.hsa.ie/eng/Legislation/Regulations\\_and\\_Orders/General\\_Application\\_Regulations\\_2007/General\\_Application\\_Regulations\\_2007\\_S\\_I\\_2007\\_.pdf](https://www.hsa.ie/eng/Legislation/Regulations_and_Orders/General_Application_Regulations_2007/General_Application_Regulations_2007_S_I_2007_.pdf)

### Fire Assembly Points

On hearing the Fire Alarm, go directly to the designated assembly point as follows:

Áras an Phiarsaigh go to the **Rugby Pitch Car Park.**



SNIAM go to the triangular area (called the “**Flat Iron**”), near the Rugby Pitch, at the east end of College Park.



Stack B Gravelled tree lined area outside front entrance.

Assembly Point is the gravelled tree lined area to the rear



## Fire Wardens

Duties of the EEE Fire Warden are:

1. Carry out a weekly check to ensure:
  - a. Escape route exits can be opened from the inside by any person within the building
  - b. Escape routes are not obstructed
  - c. All combustible materials are removed from escape routes
  - d. All fire extinguishers, directional signs, and other items in association with fire safety are in position and functioning
2. Monitor EEE Discipline areas to ensure compliance with fire safety control measures (in conjunction with EEE Safety Officer).
3. Assist in the evacuation of the building in the event of fire or fire drill. Fire Wardens will be asked to evacuate persons as far as possible. Details of non-

compliance with fire plan or drills to be reported to the Head of Discipline and College Safety Officer.

4. Undergo training in basic fire safety.
5. Ensure fire doors are kept closed (not locked).
6. Report any breaches in the Fire Safety policy to the Head of Discipline if not resolved quickly.
7. Monitor the observance of 'No Smoking' rules and report any contraventions to the Head of Discipline.

The following persons have been designated as Fire Wardens:

Stack B	Dr. Enda Bates
Áras an Phiarsaigh	Mr. Cormac Molloy Mr Shane Hunt
SNIAM	Dr Tania Perova

## FIRST AID

During normal office hours emergency medical attention can be obtained from the Student Health Services. This is located at House 47 which is near the Beckett Theatre and beside the Rugby Pitch.

The EEE safety officer ensures that first aid kits are supplied and stocked. Staff are obliged to know the exact location of their nearest first aid box.

The following contents are recommended and provided:

- Wrapped sterile adhesive plasters
- Sterile eye pads
- Triangular bandages
- Safety pins
- Wrapped sterile wound dressings
- Wrapped disinfectant wipes
- Water based burns dressing
- Paramedic shears
- Pairs of examination gloves
- Pocket face mask
- Bottle of sterile water (in case of no clear running water)

Chapter 2 of Part 7 of the General Applications Regulations 2007 sets out requirements relating to first aid at places of work.

The HSA provided in May 2008 a booklet: *Guidelines on First Aid at Places of Work*.

This is also in the EEE. Safety pages at:

<https://www.tcd.ie/media/tcd/elecengineering/pdfs/hsa-first-aid.pdf>



In the event of a person suffering sudden cardiac arrest, Automatic External Defibrillator (AED) equipment is available in College at the locations in the link below:

<https://www.tcd.ie/safetyoffice/assets/pdf/AED-Locations-May-2021.pdf>

They must only be used by trained first aiders.

#### First Aid Personnel

Details of first aid personnel within the areas occupied by the EEE Discipline are given on the relevant notice boards or posted at the First Aid boxes which are located in all of the EEE Discipline's laboratories.

Some members of staff within our Discipline are trained as occupational first aiders, namely:

Mr. Mark Linnane in Áras an Phiarsaigh  
Mr. Shane Hunt in Áras an Phiarsaigh  
Ms. Tania Perova in SNIAM  
??? in Stack B

They have received training to offer first aid to staff, students and visitors, when called upon in the case of accidents and injuries.

In addition to this, the EEE Safety Officer has received training in cardio-pulmonary resuscitation (CPR) and the use of an automated external defibrillator (AED).

#### Electrical Emergency Response

The following instructions provide guidelines for handling an electrical emergency involving **electric shock**:

**IMPORTANT:**

Great care must be taken to not make contact with the victim until the source of the current has been removed or switched off either at the bench or at the main distribution board. Never touch the casualty with bare hands unless you are sure there is no danger to yourself.

When someone suffers serious electrical shock, he or she may be knocked unconscious. Electric current passing through the body can cause cardiac arrest, burning, and shock.

Whatever the cause of an electrical accident,

- Have someone call for emergency medical assistance immediately.
- Switch off the electrical supply if possible or remove fuse.

- Remove the casualty from contact with the electrical source, using non-conductive articles such as a dry brush handle, cardboard, or piece of clothing.
- Only approach the casualty once the current is off, or the contact is broken

At that point **FIRST AID** should be given to the casualty.

## HEALTH & SAFETY POLICY

Health & Safety 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 & Safety Statement and codes of practice for the EEE Discipline are set out here and you must read, understand and abide by them.

### Objectives

1. To establish a safe environment for all.
2. To establish and maintain safe working procedures for staff and students.
3. To encourage health and safety as an integral part of work by all staff and students.
4. To develop and maintain a safety consciousness and a safety culture within this Discipline and the School of Engineering.

All reasonable steps will be taken to ensure that the health, safety and welfare of staff, students or others are not put at risk by, or as a result of, the activities of the EEE Discipline. Adequate resources will, as far as is reasonably possible, be made available in relation to health, safety and welfare matters.

All affected staff will receive the necessary, and up-to-date information, instruction and training, and adequate levels of supervision to undertake work activities in a safe manner.

### Safety Statement

This Safety Statement applies to the entire Discipline and its purpose is to describe how to proceed correctly and safely in the Electronic & Electrical Engineering workplaces.

The EEE Discipline recognises and will ensure compliance with the requirements of the Safety, Health and Welfare at Work Act, 2005, associated legislation made under the Act, and the College Safety Statement as well as College Policies and Codes of Practice.

Thorough consultation will take place with staff, safety representatives and student representatives on health, safety and welfare in order to ensure the effectiveness of this Safety Statement and the College Safety Statement.

The Safety Statement should be in a form and in a language that is easily understood. It will be brought to the attention of all staff at least annually and, at any other time following any amendment to the Statement such as, any updated risk assessment. It will also be brought to the attention of postgraduates, students, and research staff.

### Health and Safety Legislation

The primary law that governs safety at work is the "Safety, Health and Welfare at Work Act 2005." Among other things, this Act defines all the relevant terms, sets out the responsibilities, and deals with the Safety Statement.

The "General Application Regulations 2007" came into force on 1-Nov-2007 with the aim of simplifying health and safety law by incorporating into one legislative enactment the specific health and safety laws which apply **generally** to **all** employments.

The "2007 Code of Practice for the Safety, Health and Welfare at Work (Chemical Agents) Regulations 2001 (S.I. No. 619 of 2001)" is relevant to activity within the EEE Discipline.

A "Guide to Chemicals Act 2008 and 2010" must be consulted at the EEE website or at the Health and Safety Authority website by all staff whose work involves using chemical substances. See either

[https://www.hsa.ie/eng/legislation/acts/chemicals\\_acts\\_2008\\_and\\_2010\\_and\\_the\\_guide/](https://www.hsa.ie/eng/legislation/acts/chemicals_acts_2008_and_2010_and_the_guide/)

Or

<https://www.tcd.ie/eleceng/safety-statement/>

This Guide is aimed at manufacturers, suppliers, distributors, downstream users, only representatives under Article 8 of the REACH Regulation, importers, exporters etc. of chemicals, as well as employers, managers, employees, safety representatives, safety and health practitioners, the general public and others to whom the legislation is relevant. The Guide gives guidance on the Chemicals Act 2008 (No. 13 of 2008).

## ORGANISATION & RESPONSIBILITIES

### Organisation

The Discipline of Electronic and Electrical Engineering within the School of Engineering is located in three separate buildings the latter two of which are on the Campus. These are:

1. Stack B, Ground Floor and Basement
2. Áras an Phiarsaigh, 2<sup>nd</sup>, 3<sup>rd</sup>, and 4<sup>th</sup> Floor
3. Sami Nasr Institute for Advanced Materials (SNIAM), 3<sup>rd</sup> Floor

The three locations contain several areas with a variety of risks. Each of these areas is subjected to an annual risk assessment in which control measures are determined and put in place. Each of these areas is dealt with in separate risk assessment. Please see below in section 5.

### Responsibilities

Health & Safety is the responsibility of everyone. Staff and students have a personal responsibility for the safety of themselves and others. Any potentially hazardous situation should be notified, without delay, to the Head of Discipline, or to the EEE Safety Officer, or the Chief Technical Officer.

### Head of the Discipline

The Head of the Discipline, Dr. Nicola Marchetti, is responsible for the overall Safety in the Discipline of Electronic and Electrical Engineering. He is supported by the EEE Safety Officer, Cormac Molloy, and they require the full co-operation of all staff.

The Head is responsible for the health, safety and welfare at work of all staff and visitors to EEE, and **anyone** using the facilities under his control, or any person who may be affected by the activities within EEE.

The Head will ensure that policies, codes of practice, procedures and any other information necessary for the safe and healthy operation of the EEE Discipline are prepared, made available to his staff and students and are adhered to. These documents will be kept up to date by regular review and revised if no longer applicable.

The Head will ensure that adequate information related to Health and Safety, instruction, training, including induction training, and supervision, are given to all staff and to all students within his area of responsibility. The Head will consult, either separately or collectively, with his staff, students and safety representatives on matters related to health, safety and welfare.

A detailed description of the responsibilities of the Head of Discipline with respect to safety is given in the College Safety Statement which you can find at:

<https://www.tcd.ie/safetyoffice/assets/pdf/TCD-Framework-Safety-Statement.Rev.3.0.pdf>

The Head may delegate to staff such duties - duly documented - as considered appropriate to assist in discharging his/her responsibilities. The Head must ensure that those staff have received the appropriate information, instruction and training and have the authority to undertake these duties.

#### All Members of Staff

At all times members of staff must carry out their duties in accordance with the Safety, Health and Welfare at Work Act, 2005, i.e.

1. Take reasonable care for their own safety, health and welfare and that of any other person who may be affected by their acts or omissions while at work
2. Co-operate with other College staff to comply with any of the relevant statutory provisions
3. Read the College Safety Statement and the EEE Safety Statement and to carry out their activities in accordance with these statements
4. Report to the Head, or immediate supervisor, without unreasonable delay, any defects in plant, equipment, place of work or system of work, which might endanger safety, health or welfare, of which he becomes aware
5. Report any incident where injury or damage has resulted, as soon as is practicable and cooperate in the investigation of accidents
6. Ensure that they are familiar with all exit and fire exit routes for locations in which they are working, the location of firefighting equipment and the actions to take in the event of an emergency
7. Use in such manner so as to provide the protection intended, any suitable appliance, protective clothing, convenience, equipment or other means or thing provided (whether for their use alone or for use by them in common with others) for securing their safety, health or welfare while at work
8. Forbid untrained persons to use EEE laboratory equipment.

#### EEE Safety Officer

The EEE Safety Officer advises and assists the Head of Discipline on any revision of health and safety policy. They liaise with the College Safety Officer and with other officers when necessary. They monitor that safe working practices and procedures are complied with. The officer will keep the EEE Safety Statement up to date through regular review. This is undertaken twice per year when a risk assessment is carried out, or revised, in all EEE Discipline's work areas.

Should any accidents or dangerous incidents occur then the Safety Officer will keep a record of them. In the case of accidents leading to personal injury, or in the case of serious incidents, the College Safety Officer will be notified. An official College Incident Form must be completed as soon as possible after the incident.

Incident report forms are done online on iProtectU at:

<https://iprotectu.tcd.ie/report/combined>

The Safety Officer for Electronic & Electrical Engineering is:

**Mr. Cormac Molloy** - who may be consulted on health and safety matters associated with EEE at:

Rm 2.26 2<sup>nd</sup> floor AAP

Phone: 01 896 2288

email: [cormac.molloy@tcd.ie](mailto:cormac.molloy@tcd.ie)

In his absence, please contact:

the Head of Discipline concerning day-to-day safety matters,  
Second floor of AAP, Phone: 01 896 2900

### Teaching Staff

Principal Investigators responsible for Research Areas must ensure that a risk assessment of their researchers' work activities is completed and revised as required.

Members of the teaching staff have a responsibility for students who work under their direction, and must satisfy themselves, so far as is reasonably practicable, that the equipment, materials and environment provided for their students' use are safe when used in the manner specified, and that they and their students are aware of the potential hazards and risks associated with any piece of work, the precautions to be taken, and all relevant emergency procedures. Safety should be monitored on a regular basis and any comments, queries and suggestions about safety issues should be forwarded to the Head of Discipline, or the EEE Safety Officer, or the Chief Technical Officer.

The EEE Discipline has an important role to play in inculcating safe methods of work among young students of electronic and electrical engineering. Students should learn how to foresee hazards, take avoiding actions or precautions, and follow safe working rules and practices.

### Technical and Administrative Support Staff

Administrative Support staff and Technical Support staff have a responsibility to follow safe laboratory practices for their own benefit and for that of students and researchers working in the various laboratories of EEE. On a day-to-day basis safety is monitored by forwarding comments, queries and suggestions about safety issues to the Safety Officer or the Technical Officers.

### Students

The EEE Staff have a duty to ensure the health, safety and welfare, so far as is reasonably practicable, of those students engaged in the activities of the EEE Discipline. Undergraduates must always be supervised when they are in the EEE

laboratories. The exception to this rule applies to Final Year students working on their projects which are overseen by their respective project supervisors.

Students are obliged to co-operate by taking proper care for their own health and safety and for that of others who may be affected by their acts or omissions. They are obliged 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. They must wear personal protective equipment if asked to do so. They must co-operate in the investigation of accidents.

### Visitors and Contractors

Staff are responsible for ensuring that their visitors – especially those who may be working temporarily in laboratories - are aware of all the EEE safety rules. In particular, visitors and contractors working in EEE must be made aware of the fire evacuation procedure and have been informed of any special risks associated with the area being visited. Visitors who are not technically qualified should not be left alone in any laboratory. Transition year school students, who may be temporarily attached to the Discipline are classified as non-technical visitors.

The Health & Safety Authority (HSA) provides a guide concerned with the employment of young persons on work experience:

<https://www.tcd.ie/eleceng/safety-statement-/>

## HEALTH AND SAFETY ARRANGEMENTS

This section of the Safety Statement details what arrangements for health, safety and welfare issues are in place locally within the EEE Discipline work areas.

### Fire Safety

Specific fire hazards must be identified, and checks are made to ensure they are catered for in the current fire protection arrangements. The EEE Safety Officer checks weekly that:

- all fire exits and escape routes are marked and kept free from obstruction
- all fire appliances are correctly labelled, sited and maintained
- Fire doors are not left open or jammed open.
- housekeeping is of a high standard, noting e.g. material storage, waste disposal, removal of spillages
- flammable liquids are stored properly
- all corridors, stairways, fire exits, access and egress points to the workplace are maintained and kept clear
- safety signs remain adequate in terms of the assessed risks
- fire instructions are prominently displayed.

In rooms where flammable or other hazardous gases are in use, appropriate signage must be displayed on the room entrance.

### Fire Alarm and Evacuation Procedures

College buildings are provided with an automatic fire alarm system, which is regularly tested. The fire alarm can be manually triggered from any of the several break-glass alarm boxes, which are in strategic positions throughout the various corridors and laboratories. In the event of the alarm sounding you must evacuate the building immediately using the nearest available exit route. In the event of an emergency evacuation all personnel must obey, promptly, all instructions given by the Fire Wardens or the Security Staff.

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 except by disabled people. After evacuating the building go directly to the designated assembly point.

### Fire Drills

Fire drills are held during each calendar year and are attended by the College Fire Officer and by members of the College Security Staff. Drills are held without prior notice and during working hours. 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.

### Firefighting equipment

Regular inspection and servicing of fire extinguishers are carried out under the direction of the College Building Office. **Any person who has used one of the fire extinguishers, even for a very short time, must report the fact immediately to the 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 use of any fire extinguisher.

### Smoking

The College policy regarding smoking in College is given in the Tobacco Smoking (Prohibition) Regulations, 2003 - smoking in College buildings and enclosed workplaces is absolutely prohibited.

### Accident or Incident Reporting

In the event of any incident involving accident or serious damage to property the Head of Discipline and the EEE Safety Officer must investigate the incident and



report the incident to the College Safety Officer. Incident report forms are available online through iProtectU at <https://iprotectu.tcd.ie/report/combined>

Near miss incidents must also be reported.

### Work-Related Stress

Stress is only partly a work-related issue, but the Health and Safety Authority provides guidance on helping employers and employees to eliminate work-related stress.

See their booklet "Work-Related Stress - A Guide for Employers" on the EEE web pages about safety.

The aim is to raise awareness of stress and its causes by informing employers and employees of the main sources of stress at work, the behavioural and psychological results of stress and some of the harmful consequences for an employee's health which can arise if stress at work is not addressed promptly.

Further information relating to stress can be found at the TCD Health Centre web pages.

<https://www.tcd.ie/collegehealth/promotion/mental-health/stress.php>

### Pregnant Employees

Chapter 2 of Part 6 and Schedule 8 to the Regulations 2007 states that requirements relating to the Protection of Pregnant, Post Natal and Breastfeeding Employees including risk assessment, protective or preventive measures, night work and information. The H&S Authority guide is available on the EEE website <https://www.tcd.ie/eleceng/safety-statement/>.

Schedule 8 to the General Application Regulations 2007 lists physical, biological and chemical agents, processes and working conditions known to endanger the safety or health of pregnant or breastfeeding employees and the developing child.

### Lone Working or Out-of-Hours Working

All lone working should be subject to a written risk assessment as required by law.

A 'lone worker' is defined as anyone working out of contact with other persons. Staff must be aware of the foreseeable risks which may arise and the measures they must take to ensure their own safety. Working out-of-hours AND alone poses other risks. There are three main categories of risk: (i) fire, (ii) encountering an intruder or feeling threatened by one or more other people, and (iii) accidental injury or a medical emergency. All lone workers must download the SafeZone app on their phone and use that for checking in and out. The app will periodically check that you are safe. If you do not respond, Campus Security will be alerted.

If you detect an intruder or feel threatened: If possible, you should lock yourself in your office and press the panic alarm on the SafeZone app or phone security on 1999. Do not put yourself in danger by challenging or confronting an intruder. The risk of intruders can be reduced if everyone takes responsibility for ensuring that the access doors to the various floors of the building are locked (where possible) outside of normal working hours (i.e. main access doors to buildings should be locked after 18.00, Monday to Friday and always during weekends and holidays).

## GENERAL SAFETY RULES AND PRECAUTIONS

### Fire Safety in Offices and Laboratories

The principal hazard in offices is fire. Fire hazards are created as a result of defective wiring and sockets, overloading of electrical circuits and the use of freestanding heating appliances.

The principal hazard in laboratories is fire. See the fire risk assessment sheets which are applicable to each Laboratory.

Systems, experiments or equipment should not be left running unattended without consulting with the Principal Investigator about safety issues. An “Unattended Apparatus” form must be filled in and clearly displayed beside the equipment. The form is provided at: <https://www.tcd.ie/eleceng/safety-statement/>

All working areas must be kept clean and tidy. Coats, bags, etc. must not be left anywhere they could cause an obstruction. Laboratories that contain specific identified hazards (e.g. high voltage equipment, hazardous substances, lasers) must be clearly marked with warning signs. Access to such areas must be strictly limited to authorized personnel.

Researchers must not attempt new procedures or tasks involving risk or hazard without consulting their supervisor and having received appropriate training.

#### **Computer users:**

Do not attempt to service a computer unless you have been trained to do so.

Ensure that nothing rests on your computer's cables and that the cables are not located where they can be stepped on or tripped over.

Please keep food, drinks and bottles of water away from the computer.

Before you clean your computer, disconnect it from the mains outlet.  
Clean your computer with a soft damp cloth. Do not use any liquid or aerosol cleaners, which may contain flammable substances.

## Handling Hazardous Substances

Every employer who undertakes work which is liable to expose an employee to a substance hazardous to health shall provide that employee with suitable and sufficient information, instruction and training.

Details of the substances hazardous to health to which an employee is liable to be exposed including the names of those substances, and the risk which they present to health, and the appropriate precautions. Every employer shall ensure that suitable personal protective equipment is provided to his employees who may be exposed to a risk to their health and safety while at work. Personal protective equipment means all equipment and clothing, or accessory, intended to be worn or used by a person at work to protect him/her against one or more risks.

## Handling Gases

A member of staff required to handle gas cylinders must undergo detailed training for this activity.

### Compressed Gases, Gases, and Empty Cylinders

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. Never remove or deface cylinder identification
3. Store cylinders vertically and clamp securely to prevent toppling
4. 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 the laboratory except by permission of the College Safety Officer. Only those cylinders that are in current use may be kept within the laboratory. Cylinders are not to be stored 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 for each gas used in the Laboratory. This must be clearly displayed near the cylinder
11. A "Compressed Gas Cylinder in Use" form listing all the compressed gas cylinders currently in use must be displayed outside the entrance to the laboratory. The form can be found at <https://www.tcd.ie/eleceng/safety-statement/>
12. Only trained personnel and the appropriate trolley may be used to move heavy cylinders
13. In SNIAM gas cylinders must not be transported in occupied lifts. Staff must follow the procedure of closing the lift off with the chain and sign provided

14. Use only approved regulators and check their suitability for the gas in use. It is recommended that regulators are either replaced or refurbished after (at maximum) 5 years from date of purchase
15. 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
16. Always close the main cylinder valve when the cylinder is not in use and ensure that an appropriate cylinder key is readily available for rapid shut down of a cylinder
17. All compressed cylinder gases should be ordered through the Chief Technical Officer with a signed requisition from the Principal Investigator.

## Handling Chemicals

The policy of the EEE Discipline is to abide by the Code of Practice entitled "2007 Code of Practice for the Safety, Health and Welfare at Work (Chemical Agents) Regulations 2001 (S.I. No. 619 of 2001)" in accordance with section 60 of the Safety, Health and Welfare at Work Act 2005 (No. 10 of 2005).

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. Wear protective equipment and clothing as trained to do so. Adequate ventilation must be provided. Facilities for washing and cleansing of the skin must be provided.

All persons working with chemicals must wash and dry their hands carefully after removing gloves and before leaving the laboratory.

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

In an emergency, all standard first aid and health and safety bodies emphasise that plain water is the ONLY medium recommended for immediate treatment of corrosive substance contamination.

Toxic substances are harmful, that is, they are substances or preparations which in low quantities can cause death or acute or chronic damage to health when inhaled, swallowed or absorbed via the skin.

Corrosive substances and preparations are those which may, on contact with living tissues, destroy them.

Sensitising substances and preparations are those which, if they are inhaled or if they penetrate the skin, are capable of eliciting a reaction by hypersensitisation such that on further exposure to the substance or preparation, characteristic adverse effects are produced.

- work must not be carried out until a suitable and sufficient assessment of the risks to health and safety and the action required to eliminate or adequately control exposure has been made by a competent person
- a written record of the assessment must be made as soon as practicable
- copies should be made available to anyone who may be at risk
- assessments should be reviewed regularly (at least every year) and if there are significant changes in the work, the original assessment ceases to be valid
- control should be secured, if practicable, by measures other than the provision of personal protective equipment

A risk assessment of chemicals used in the EEE section of SNIAM is undertaken following the procedure provided in the Health and Safety Authority booklet: *Risk Assessment of Chemical Hazards*.

This is also provided on the EEE website:

<https://www.tcd.ie/eleceng/safety-statement/>

or the [chemical & safety] link at:

[https://www.hsa.ie/eng/legislation/acts/chemicals\\_acts\\_2008\\_and\\_2010\\_and\\_the\\_guide/](https://www.hsa.ie/eng/legislation/acts/chemicals_acts_2008_and_2010_and_the_guide/)

All staff who are required to handle cryogenics must attend online safety training – provided externally, but approved by College - which covers the safe handling, storage and use of cryogenics such as **liquid nitrogen**, the characteristics of cryogenics and associated hazards, personal protective equipment, filling dewars, handling cylinders, oxygen depletion and risk assessment. There is also a British Compressed Gases Association guide to the safe usage of Liquid Nitrogen available at the EEE website.

**Ferrofluids** are not classed as hazardous materials. Ferrofluids consist of circa 100Å diameter particles of a magnetic solid (usually magnetite, Fe<sub>3</sub>O<sub>4</sub>) colloidally suspended in a carrier fluid. Typical carrier fluids include hydrocarbons, water, fluorocarbons, esters, diesters, organometallics, polyphenols.

Normal industrial health and safety procedures should be practised when handling any ferrofluid. Rubber or latex gloves and goggles should be worn. In case of contact with skin the affected area should be washed with mild soap and water. In case of eye contact, the eyes should be flushed with plenty of clean water for 15 minutes.

### Safety Data Sheets

Safety Data Sheets are provided by the supplier of each substance. As a rule, all chemicals must be ordered through the Chief Technical Officer. The Safety Data Sheet must be easily available for consultation in the relevant laboratory in SNIAM

and a copy of the Data Sheet is retained by approved handlers on Labcup. Any instructions on the Data Sheet must be followed.

## REACH

“REACH Regulation” means Regulation (EC) No. 1907/2006 of the European Parliament and of the Council of 18 December 2006 concerning the Registration, Evaluation, Authorization and Restriction of Chemicals (REACH) and establishing a European Chemicals Agency, as amended by Council Regulation (EC) No. 1354/2007 of 15 November 2007.

## Spills and Disposing of Chemicals

Clean all spillages immediately and dispose of waste correctly. Ventilate the area if necessary. Chemicals and dangerous waste may only be disposed of in consultation with the Chief Technical Officer and through the Hazardous Materials Facility (HMF) in College. All related information for the required disposal of hazardous waste is available at <https://www.tcd.ie/hazardousmaterials/services/>.

## Storage and Labelling of Chemicals

All chemicals and chemical products must be properly labelled - including warning signs - and stored in their own appropriate containers.

Chemicals must NEVER be stored in unmarked containers.

A lockable steel cabinet must be provided to store chemicals in a laboratory.

No person may take any item from this cabinet without permission from the Principal Investigator.

An inventory of chemicals and quantities must be compiled and displayed.

## Fume Cupboard

The fume hoods in SNIAM laboratories must be tested for efficiency on an annual basis. This is done in consultation with the Director of Buildings Office.

## Electrical Safety in Laboratories

Part 3 of the 2007 Regulations relates to Electricity and states that a range of requirements including suitability of electrical equipment and installations, adverse or hazardous environments, identification and marking, protection against electric shock, portable equipment, connections and cables, overcurrent protection, auxiliary equipment and battery supply, precautions for work on electrical equipment, working space, access and lighting, competent persons, testing and inspection, earth leakage protection for higher voltage, switch rooms.

Please see 2007 Regulations:

[https://www.hsa.ie/eng/Legislation/Regulations\\_and\\_Orders/General\\_Application\\_Regulations\\_2007/General\\_Application\\_Regulations\\_2007\\_S\\_I\\_2007\\_.pdf](https://www.hsa.ie/eng/Legislation/Regulations_and_Orders/General_Application_Regulations_2007/General_Application_Regulations_2007_S_I_2007_.pdf)

Electricity is perfectly safe if treated with respect. Most of the time, we take it for granted. Occasionally, things go wrong, usually for a simple reason. Remember that the generally accepted level for a lethal current is only 50 mA. (one twentieth of an Amp). Voltages above 50 V RMS AC and high voltage DC are always dangerous. Extra precautions should be considered as voltage levels are increased.

Electric shock is a possible outcome of electric current flowing through the human body, which causes disturbances in the normal function of the body's organs and nervous system. However, the risks also include serious injury and burns.

Staff must comply with all work procedures in laboratories and abide by the following rules for avoiding electrical accidents:

- Check that mains sockets are not broken or loose.
- Check that the plugs, leads and sockets of multiway plugboards are not defective or damaged or overheating.
- Do not connect multiple extension sockets together.
- Do not overload sockets. Overloaded sockets pose a serious risk of electrocution to staff and students alike or can result in overheating which may lead to fire.
- Keep water away from electricity and electrical appliances.
- Never work on electrical equipment without switching it off and disconnecting it at the mains.
- Never attempt anything you are not trained to do.
- Always report electrical faults.
- Do not trail telephone, network, or electrical cables across the floor.
- Do not work ALONE while working with high voltages or if you are operating electrical machinery, such as a drill. Make arrangements with someone to check up on you.
- Place a barrier and/or a warning sign beside any experiment left unattended and turned ON.
- Do not trust supposedly discharged capacitors. Certain types of capacitors can build up a residual charge after being discharged. Use a shorting bar across the capacitor, and keep it connected until ready for use.

If you use electrolytic capacitors,

- Do not put excessive voltage across them
- Do not connect them in reverse polarity.

Class X capacitors (X capacitors for short) are capacitors with an unlimited capacitance for use where their failure due to a short-circuit would **not** lead to the danger of an electric shock. These capacitors are designed to present a short circuit when they fail. This should result in a fuse blowing. Class Y capacitors are capacitors for an insulating

voltage  $250 V_{RMS}$  with high electrical and mechanical reliability and limited capacitance. The high electrical and mechanical reliability is intended to prevent short-circuits in the capacitors. Hence the only consequence of failure is a loss of noise or interference immunity that the capacitor would supply.

Beware that **homemade** equipment is potentially dangerous.

Electrical equipment which has been brought in from countries outside the EU should NOT be used in College without proper adaptation being made. Some equipment and appliances use different voltages to that in the EU and it can be unsafe to use such equipment in Ireland.

A three-pin plug is essential with mains powered equipment. This is required by Irish Standard 401 (following British Standard 1363). Equipment must be grounded or fully isolated. Electric instruments and appliances have equipment cases that are electrically insulated from the wires that carry the power. The isolation is provided by the insulation of the wires. However, if the insulation gets damaged and makes contact with the case, the case will be at the LIVE voltage supplied by the mains. If the user touches the instrument, he or she may get a shock.

Equipment fitted with “continental” plugs will **not** fit into British-style electrical sockets and you will need to either: -

1. Remove and replace the continental plug by a British 13 Amp 3-pin fused plug. A person competent to undertake such work may change the continental plug for a British one.
2. Use a fused 2-pin to 3-pin adapter to enable them to be used with British electrical sockets. However, the adapter must have a CE mark, be fused appropriately for the equipment, include an appropriate ‘earth’ connection, and **MUST** have “shuttering” protecting the holes into which the plug is inserted to avoid the potential for accidental contact with live connectors in the adapter.

Due to an increased risk of electric shock, and the fact that laboratory equipment is expensive both to run and to repair, absolutely **no** drinking or consumption of any kind of food is allowed in laboratories.

**Soldering** should only be done at designated benches in the laboratory in consultation with a Technical Officer. Safety goggles **must** be worn to prevent the possibility of severe burns resulting from the splashing or drips of hot solder into the face and eyes. No undergraduate may use a soldering iron without first undergoing instruction from a technician or demonstrator. See also *Solder Fume and You* at <https://www.tcd.ie/eleceng/safety-statement/>. Particular attention must be paid to the competent supervision of students and other persons involved in electrical/electronic work.

### Laser Safety

All users of Class 3 and Class 4 lasers must attend a Laser Safety Training Session in order to become a registered user. It is prohibited to use such a laser in College without having undertaken training and without having signed the laser user register.



All new postgraduate students, post-doctoral researchers or senior sophister students who may be working with or in the same room as Class 3 or Class 4 lasers during their projects require training

To specify the correct goggles for your application, you need to know the Optical Density (OD) required and the wavelength of the laser you are using. The OD is the attenuation density provided by the eyewear and indicates how much energy will be blocked. This information can often be obtained from the laser manufacturer.

The College specialist advisor on lasers and laser safety is Mr. Christopher Smith. If you require training in laser safety, please contact Shane Hunt on Ext. 1865 or email [huntsf@tcd.ie](mailto:huntsf@tcd.ie).

## Manual Handling

Chapter 4 of Part 2 and Schedule 3 of the 2007 Regulations set out requirements relating to:

the *Manual Handling of Loads* as regards the duties of employers to take appropriate organisational measures or means to avoid danger in the manual handling of loads.

Where there is a risk of injury to an employee through manual handling of a load the employer must provide training in safe handling techniques. The hazards are that the load is too heavy, too awkward or may be lifted incorrectly. Injuries may include back strain, hernias, lacerations, bruises, or strains. Due caution must be taken. Appropriate staff must be trained in safe manual handling techniques. Mechanical handling devices such as mobile trolleys must be supplied where necessary for transporting equipment or goods.

## Noise

### Use of headphones

Listening to loud sounds for prolonged periods may permanently damage your hearing. Before putting on the earphones turn the volume down then put the earphones on and slowly increase the volume until you find a comfortable listening level. If you experience ringing in your ears or muffled speech, stop listening and have your hearing checked. Hearing experts suggest that to protect your hearing:

- Limit the amount of time you use earphones or headphones at high volumes.
- Avoid turning up the volume to block out noisy surroundings.
- Turn the volume down if you can't hear people speaking near you.

### Loudspeakers

A dangerous level of sound, as well as sudden impulses, specifically in the Studio in AAP, but also in other laboratories, are deemed to be hazards. Awareness signs in appropriate locations must be displayed. The training of students by providing instructions in the use of the sound equipment is the key to prevention of hazards.

For the impact and risks associated with noise in the workplace please see Chapter 1 of Part 5 of the 2007 Regulations sets out requirements relating to the Control of Noise at Work:

[https://www.hsa.ie/eng/Legislation/Regulations\\_and\\_Orders/General\\_Application\\_Regulations\\_2007/General\\_Application\\_Regulations\\_2007\\_S\\_I\\_2007\\_.pdf](https://www.hsa.ie/eng/Legislation/Regulations_and_Orders/General_Application_Regulations_2007/General_Application_Regulations_2007_S_I_2007_.pdf).

## VDU Safety

Chapter 5 of Part 2 and Schedule 4 of the 2007 Regulations set out requirements relating to the provision and use of Display Screen Equipment as regards the duties of employers concerning the analysis of the workstations, planning of work, minimum requirements for DSE, information and training and provision of eye tests and corrective appliances.

The EEE Discipline makes extensive use of computer equipment and is required to perform a suitable and sufficient analysis of those workstations with VDUs. The workstation must be adjustable to suit the individual. Some of the health complaints that may be due to long term usage of a VDU include visual fatigue, postural fatigue, headaches, neck strain and nervous conditions.

Mark Linnane is the VDU Assessor for EEE. Please contact him for an assessment of your workstation on Ext. 1318 or email [mark.linnane@tcd.ie](mailto:mark.linnane@tcd.ie).

## RISK ASSESSMENTS

The Discipline of Electronic and Electrical Engineering operates in three separate buildings on campus. The multitude of hazards associated with each work activity within each building is indicated in risk assessments carried out for each work area within the three buildings. A separate Fire-Risks Assessment is also undertaken.

The hazards and risks to safety, health and welfare at work are identified by a risk assessment. Risk assessments must be written down and form the major part of any safety statement. This is required by the 2005 Act, Section 19. Hazard identification, risk assessment, and the control measures put in place to manage those risks to health and safety, are the fundamental means by which an employer ensures the welfare of his or her employees.

In a risk assessment procedure, we are addressing the issue of hazards to which personnel working, studying, cleaning, servicing, contracting, trespassing, or visiting offices and laboratories are exposed.

**Hazard** means anything that can cause harm e.g., a broken chair, electricity, working with chemicals or power tools, noise, ventilation; to name a few from a long list.

**Risk** means the chance, great or small, that someone will be harmed by the hazard.

The degree of risk must be categorized and for our purposes we use high, medium, and low risk categories. This assists us in allocating priority among control measures. The risk assessment thus stipulates what risk control measures or arrangements are in place, or necessary.

**High risk** means the possibility of fatality or serious injury, or of minor injury to many people, or the possibility of significant material loss.

**Medium risk** means there exists the chance of a minor injury, or the risk of some material loss.

**Low risk** indicates that the possibility of injury or material loss is unlikely.

**Control measures** means specifying appropriate methods of dealing with a hazard and reducing the risks. The standard hierarchy of control measures is as follows: eliminate the risk if possible; substitute the dangerous substance or activity with less risky ones; physically contain the risk; finally, provide personal protection.

In the EEE Discipline areas, risk assessments are carried out for all work activities twice per year – usually in January and later after the second semester. If new equipment, or new practices are introduced, then these may require a risk assessment immediately and, for example, the provision of personal protective equipment, or the issuing of new instructions.

The EEE Safety Officer, the Chief Technical Officer, and the Principal Investigator responsible for each work area undertake a careful examination of each work activity. Where necessary or prudent, other safety officers may be asked to participate, or consulted for advice, for example, on the use of chemicals or lasers. Any measures to be implemented are discussed with the Head of Discipline and/or Principal Investigators. All risk assessment forms are completed online using the risk assessment tool in iProtectU -> <https://iprotectu.tcd.ie/risk/general/assess>.

The Head of Discipline has a duty to bring the Safety Statement to the attention of employees and to ensure that they are aware of the findings of the risk assessment.

Further details about the meaning and significance of *risk assessment* are given in the College Safety statement and Section 19 of the 2005 Act, and on the EEE website. <https://www.tcd.ie/eleceng/safety-statement/> -> Safety Act 2005

Fire risks and hazards are assessed separately from other specific risks and hazards and documented in Fire Risks Assessment sheets. Completed risk assessment sheets for the specific areas listed in this section are printed out and provided as part of this Safety Statement for Staff. Copies are held by the Head of

Area: SNIAM

This location is on the 3<sup>rd</sup> floor of The Sami Nasr Institute.

In the particular case of the laboratories in SNIAM where there are specific tasks being performed that pose a serious risk to safety, health and welfare, the Principal Investigators are required to bring to the attention of staff and students concerned the risks identified, the risk assessment, and the protective and preventive measures provided.

SNIAM Area: Microelectronics Technology Laboratory (MTL)

Principal Investigator: Dr Tania Perova

Measurements Lab  
Service Area -**PHYSICS**  
Roof Service Area  
Photolithography Area -**PHYSICS**  
Chemical Wet Bench -**PHYSICS**

SNIAM Area: Advanced Electronic Materials Laboratory

Principal Investigator: Prof. J.K. Vij

SNIAM Area: Research Seminar and Computer Room

Principal Investigator: Dr Tania Perova

The Common Room (Room 3.24) in SNIAM should be locked if you are the last person leaving the room. This applies at all times during the day not just outside of normal working hours. If the door is left unlocked, it presents a security risk, as this room leads to the write-up rooms and the laboratories.

Area: [Áras an Phiarsaigh \(AAP\)](#)

This location is on the 2<sup>nd</sup>, 3<sup>rd</sup>, and 4<sup>th</sup> floors of Áras an Phiarsaigh.

Offices  
Kitchen  
Under-graduate Lab (2.15)  
Cad-lab 40 seat computer lab (2.28)  
Post-graduate lab (2.31)  
Computer lab (2.02)  
Server Room (2.25)  
Workshop (2.30)

Area: [Stack B \(IFSC\)](#)

This location is on the basement, ground and 1<sup>st</sup> floor of Stack B building.

B1.01 MMT Live Studio

B1.02 MMT Control Room  
B1.08 Audio Experimental Room (Sigmedia)  
B1.09 Storage Space (Sigmedia)  
B1.13 Experimental Room (Sigmedia)

0.08 Open plan MMT Teaching Space & Laboratory  
0.00 Various MMT offices