



Xi'an Jiaotong-Liverpool University
西交利物浦大学

Health and Safety Handbook

School of Advanced Technology (SAT)

Preface

This handbook is intended to help you work safely and avoid accidents. As a new member in the School of Advanced Technology (SAT), you are required to read the information carefully, make clear your responsibilities with respect to health and safety, and wisely follow any health and safety instructions and procedures stated in the health and safety handbook.

All persons present within the School have a legal responsibility to ensure the safety of themselves and of others who may be affected by their actions. In doing so, all persons must exercise self-discipline, comply with all School and departmental codes of practices and policies, look out for potential hazards and seek to ensure that they are appropriately addressed.

Please ask for advice whenever you are in doubt with any health and safety issues. Health and safety concerns and suggestions for inclusion, corrections and revisions for future editions of this handbook should be sent to the Health and Safety Working Group (H&S officer and experimental officers).

Professor Eng Gee Lim
Dean, School of Advanced Technology, XJTLU

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1 Useful information

1.1 Campus emergency telephone number

Extension: 1061 for Science Building; Extension: 1064 for EE Building

1.2 First aiders

Name	Location	Email	Extension
Ms. Yanfei Qi	EE213A	Yanfei.Qi01@xjtlu.edu.cn	1418
Mr. Kai Zhang	EE211A	kai.zhang@xjtlu.edu.cn	4930
Ms. Qingxian Feng	SD473	Qingxian.Feng@xjtlu.edu.cn	1512

1.3 Contact information for Health and Safety

Name	Position	Email	Extension
Prof. Eng Gee Lim	Dean of School	enggee.lim@xjtlu.edu.cn	1405
Prof. Kaizhu Huang	Associate Dean, Research and Graduate Studies	Kaizhu.Huang@xjtlu.edu.cn	1404
Dr. Paul Craig	Associate Dean, Learning and Teaching	P.Craig@xjtlu.edu.cn	4833
Dr. Hai-Ning Liang	Head, Department of Computing	HaiNing.Liang@xjtlu.edu.cn	1516
Dr. Mark Leach	Head, Department of Communications and Networking; also Acting Head, Department of Electrical and Electronic Engineering	Mark.Leach@xjtlu.edu.cn	7735
Dr. Qiufeng Wang	Head, Department of Intelligent Science	Qiufeng.Wang@xjtlu.edu.cn	4765
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Ms. Fanhua Kong	H&S working group member	fanhua.kong@xjtlu.edu.cn	1419
Ms. Yanfei Qi	H&S working group member	yanfei.qi01@xjtlu.edu.cn	1418
Mr. Kai Zhang	H&S officer (laboratory); fire safety officer	kai.zhang@xjtlu.edu.cn	4930
Ms. Yang Wang	H&S working group member	Yang.Wang01@xjtlu.edu.cn	4810
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Ms. Qingxian Feng	H&S working group member	Qingxian.Feng@xjtlu.edu.cn	1512
Ms. Yiwon Ge	H&S working group member	Yiwon.Ge@xjtlu.edu.cn	1511

1.4 Other useful telephone numbers

Organisation	Telephone Number
Police station	110
Fire brigade	119
Ambulance	120
Suzhou Kowloon Hospital Shanghai Jiaotong University Medical School (http://www.sz91.com/)	0512-62629999
The first Affiliated Hospital of Soochow University (http://fyy.sdfyy.cn/)	0512-65223637
SingHealth Medical Clinic (http://www.singhealth.asia/)	0512-67671655 0512-67671611

* **Acknowledgement:** The Health and Safety Working Group would like to thank the Department of Biological Science, XJTU, for sharing their H&S handbook.

1.5 Locations of first-aid kits and fire extinguishers

First-aid kits	EE213
Fire extinguishers	Between EE305 and EE309 Between EE311 and EE313 Between EE317 and EE319

1.6 Monitoring and review schedule

Monitoring	The SAT H&S working group carries out safety inspection during each academic year and reports to the Dean and/or the concerned HoD.
Review	The School holds annual H&S review meetings or discussions to ensure that the health and safety systems continue to function adequately.

1.7 Health and safety laboratory training

The School is committed to meeting and identifying safety training needs for staff and students. The standard arrangement in place is:

- **Health and Safety Induction:** An induction by the representative of the H&S Working Group for all new students to our SAT (mostly Year 2 students and PG students of the master's degree programmes) prior to commencement of experimental classes.

2 The paperwork you need to get going

Before you begin working on anything, you may be legally required to have as appropriate:

- Standard Operating Procedure (SOP).
- Risk Assessment (RA).
- Control of Substances Hazardous to Health (CoSHH).

2.1 Standard Operating Procedure (SOP)

A Standard Operating Procedure (SOP) defines the protocol you need to follow in order to use apparatus or equipment that might be complex, expensive or potentially dangerous. Your supervisor or colleague/collaborator will have the SOP.

2.2 Risk Assessment (RA)

A Risk Assessment is a careful examination of what could cause harm to people. The aim is to make sure no one gets hurt or becomes ill.

The steps to risk assessment are:

- ✓ Identify hazards and if possible remove them.
- ✓ Identify the people who will be affected.
- ✓ Evaluate procedure for risks and determine the appropriate precautions required.
- ✓ If appropriate, record the findings and review regularly.

Some items arising under risk assessments may need assessments under different regulation which may include:

- ✓ General H&S regulation of SAT
- ✓ H&S regulation of electrical and electronics laboratories or computer laboratories
- ✓ H&S regulation of IC laboratories
- ✓ H&S regulation of RF laboratories
- ✓ H&S regulation of computer laboratories

Facilities, equipment use, relocations and processes must also be assessed. Precautions will specify personal protective equipment (PPE) such as gloves and laboratory coats. Everyone must ask for, use and help improve the risk assessments for their tasks.

Risk assessments should be signed off by the module leader or head of the research group who should be confident that the person performing the work has read and understood the assessment. If control measures are required, then these should be made available to the person prior to the work commencing.

2.3 Control of Substances Hazardous to Health (CoSHH)

All potentially hazardous substances and chemicals should be treated as dangerous unless there is evidence to the contrary. Assessment of the risks associated with the use of any hazardous substances falls under the Control of Substances Hazardous to Health (CoSHH).

Each laboratory must undertake a CoSHH assessment which should be revised annually or whenever there is a change to procedures. This must take into account the risks posed by the use of any substance which may be hazardous, detailing appropriate precautions for use, minimising the risk, containment, any protective clothing requirements and the ultimate means of disposal of any product or residual material.

In addition, the assessment must identify actions required for dealing with any issues arising from the procedure. If health surveillance or monitoring is appropriate, these must be specified and appropriate arrangements made. Relevant information may be found in reference books, databases or obtained from the manufacturers. However, manufacturer's data by itself does not normally constitute a suitable and sufficient assessment as the conditions, volumes and other preparations with which the substances may come into contact must be considered.

This assessment should be read and signed by the Principal Investigator involved in work covered by the assessment.

3 General health and safety guidelines in laboratories

A science or engineering laboratory or lab is a place of adventure and discovery. One of the first things any scientist or engineer learns is that working in the laboratory can be an exciting experience. However, the laboratory can also be quite dangerous if proper safety rules are not followed at all times. In order to prepare yourself for a safe year in the laboratory, read over the following safety rules. Then read them a second time. Make sure you understand each rule. If you are not sure of any of the rules, ask the module leader, head of the research group and experimental officers for guidance. When you are satisfied that you understand all the rules in the handbook, sign and date the Health and Safety

Agreement Form as shown in the Appendix. Signing the form declares that you are aware of the rules of the laboratory.

3.1 Dress code

1. Tie back long hair in order to keep it away from any devices, or other laboratory equipment.
2. Any article of clothing or jewelry that can hang down and touch machines, chemicals and flames should be removed or tied back before working in the laboratory. Sleeves should be rolled up.
3. Sandals will not protect the feet.

3.2 General safety rules

1. Read all directions for an experiment several times. Follow the directions exactly as they are written. If you are in doubt about any part of the experiment, ask your teacher for assistance.
2. Never perform activities that are not authorised by your teacher. Always obtain permission before "experimenting" on your own.
3. Never handle any equipment unless you have specific permission.
4. Never eat or drink in the laboratory.
5. There should be no loud talking or horseplay in the laboratory.
6. When performing a lab, make sure the work area has been cleared of purses, books, jackets, etc.
7. Know the location and use of all safety equipment (fire extinguishers, etc.)
8. Read your assignment before coming to class and be aware of all safety precautions. Follow directions.
9. Never work alone in the laboratory.

3.3 Using potentially hazardous instruments (soldering iron and blade)

1. Never touch the tip of the soldering iron while in use. Depending on the temperature setting, they could be very hot (e.g., 400°C) and will give you a nasty burn.
2. Always return the soldering iron to its stand while not in use. Never put the soldering iron down on your workbench at any moment.
3. Work in a well-ventilated area with soldering iron.
4. The smoke formed as you melt solder is mostly from the flux and quite irritating. Avoid breathing it by keeping your head to the side of, not above, your work.
5. Some solder contains lead which is a poisonous metal. Wash your hands after using solder.
6. Handle blades with extreme care. Never cut any material towards you: always cut away from you.
7. Notify your teacher immediately if you are cut in the laboratory.
8. Properly mount, dissecting specimens to the dissecting pan before making a cut.

3.4 Electrical equipment rules

1. Batteries should never be intentionally shorted. Severe burns can be caused by the heat generated in a bare copper wire placed directly across the battery terminals. If a mercury type dry cell is shorted, an explosion can result.
2. **Never deliberately shock yourself or another person.** Susceptibility to shock and possible resulting injury is unpredictable because of the many physical and physiological variables.
3. Turn off all power when setting up circuits or repairing electrical equipment.
4. Never use such metal articles as metal rulers, metal pencils or pens, nor wear rings, metal watchbands, bracelets, etc. when doing electrical work.

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5. When disconnecting a piece of electrical equipment, pull the plug and not the wire.
 6. Use caution in handling electrical equipment which has been in use and has been disconnected. The equipment may still be hot enough to produce a serious burn.
 7. Never connect, disconnect, or operate a piece of electrical equipment with wet hands or while standing on a wet floor.

3.5 End-of-experiment rules

1. When an experiment is completed, always clean up your work area and return all equipment to its proper place.
2. Wash your hands after every experiment.
3. Make sure all powers are turned off before leaving the laboratory.

4 Health and safety regulations for specific laboratories

4.1 Health and safety regulation for electronics laboratories

4.1.1 General health and safety regulation regarding electricity

Electricity is found in every room and laboratory in the University. We tend to take it for granted and forget that inherent dangers can be present in the form of shock and/or fire hazards.

In general, it is important to remember one thing: **IT IS THE CURRENT THAT KILLS**, not the voltage level of the power source involved. When you accidentally make part of your body a part of an electrical circuit by simultaneously making contact with both a voltage source and a ground, the current that flows in your body determines the seriousness of the shock.

Body contact resistance varies from several kilo ohms (dry) to less than one kilo ohms (wet); internal body resistance is about 500 ohms from hand-to-foot, and about 100 ohms ear-to-ear. Since current equals to voltage divided by resistance, it can be seen that sweaty hands in contact with a source as low as 100 volts can produce a body current of at least 100 mA which is enough to kill you if it passes through your body.

Generally, the results shown below in Table 1 from various levels are to be expected.

Current (unit: mA)	Effect
0-1	No sensation
1-3	Mild perception
3-10	Painful shock, muscular contraction
Over 10	Paralysis, inability to let go
Over 30	Asphyxiation, unconsciousness
80-240	Fibrillation
4000	Heart Paralysis
Over 5000	Burning

There is only one rule in working safely with electrical equipment: **NEVER TAKE A CHANCE.** If you have any doubts or questions, ask for the advice of knowledgeable people.

The general safety rules regarding electricity and electrical equipment include

1. Electrical equipment should be intrinsically safe when part of an experiment or when used routinely in an area where there are flammable gases or liquids. Care must be exercised to identify possible sources of ignition.
2. As a general rule, electrical equipment should be properly grounded. In most cases, this means tying in the main building ground.
3. Flammable gas- or liquid-filled equipment should be analysed to see if there is any danger of static discharge acting as an ignition source. A way to avoid this problem is to ground the piece of equipment. Take care that a good electrical contact always exists between the equipment and the ground.
4. All unused or unnecessary electrical equipment should be removed from the laboratory area and stored in a proper storage location.
5. All electrical equipment should be checked on a regular basis.
6. Leads with 50 or more volts should be shrouded or taped for shock protection.
7. A sign which states, "**DANGER--HIGH VOLTAGE**," should be easily visible when high voltage equipment is in use.
8. **Know the location of circuit breakers and emergency power shut-offs.**
9. Turn off all power and ground all high-voltage points before working on any electrical apparatus. Be sure that all capacitors are completely discharged. Make sure that power cannot be accidentally restored by another person.
10. Move slowly around all electrical equipment to make sure that you are always in good balance. Do not lean on or casually touch the apparatus.
11. Never work on live equipment when tired.
12. Never touch electrical equipment when standing on a damp floor or a metal floor. Do not handle electrical equipment if you or the equipment is damp or wet.
13. You should not use "cheater plugs" to ungrounded oscilloscopes and other test equipment. It is far better to fix the problem than to try and circumvent it in an unsafe manner.
14. Do not use water on an electrical fire.
15. Never take a voluntary shock. Use a meter, not your hand, to see if power is present.
16. Use dry insulating material (rope, wood, clothes) to remove a victim from a live electrical circuit, if power cannot be turned off. Move quickly, as delay may be fatal. Yell loudly, "HELP", and call for emergency medical personnel.
17. CPR, by a certified person only should be started immediately on a victim whose heart has stopped beating, and be continued until the victim has regained consciousness and begins to breathe normally, or until a doctor takes charge.
18. Un-fused extension cords present real dangers in the office. The tendency is to use them without regard for their current rating. If a 5 amp extension cord is used with a space heater, for example, the cord will heat up to the point of melting the insulation and presenting an extreme fire hazard. NEVER use un-fused extension cords without first assuring yourself that you are not violating its current rating.

4.1.2 Health and safety regulation for students regarding electricity

To ensure you and your colleagues' safety and also to prevent damage to the apparatus, every student is required to obey the following regulations. Violating the regulations may result in you being told to leave the laboratory and/or a deduction in your mark for the laboratory.

1. You are required to be at the laboratory five minutes earlier.
2. You cannot change your group without the permission of the demonstrator.
3. Obey the instructions issued by the demonstrators in the lab.
4. Go to the bench assigned to you, not to any other bench unless told to do so by the demonstrator.

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5. If your partner is absent, report it to the demonstrator.
 6. If you cannot attend the laboratory, you must ask for leave first.
 7. Listen to the demonstrator's short introduction of the experiment, pay special attention to any information about safety.
 8. Before making any wiring connections, turn off the power, then make the wiring connections; Re-check the wiring connections then, if correct, turn on the power.
 9. Check and make sure that your data record is complete, before you leave the laboratory.
 10. Turn off the power, both on the equipment and on the bench socket, before you leave.
 11. Leave the equipment as you found it, tidy up the bench, ready for the next group.
 12. Make sure you return any equipment borrowed from the Technician's office to the Technician's office before you leave the laboratory.
 13. If you are absent in the lab or you do not hand in your homework, your mark of the laboratory will not be assigned. This may cause failure of the module.

4.2 Health and safety regulation for IC laboratories (Energetic Photonics)

4.2.1 Aims and scopes of regulation

4.2.1.1 Aims

These laboratory regulations are intended to ensure safe working practices, environmental protection and operating efficiency with regard to laboratory use. Essentially, these targets are to be achieved by responsible, competent and correct use of the installations, machinery and equipment, as well as an economical use of energy, water and other resources. They should help:

- To keep a positive working environment,
- To safeguard the health and physical safety of laboratory users,
- To keep damage to a minimum in the case of accidents,
- To avoid environmental pollution.

4.2.1.2 Scope and responsibilities of laboratory users

The laboratory regulations are valid for all users of laboratories in the Laboratory of Energetic Photonics.

Laboratory users must be aware of and adhere to these laboratory regulations. Each user must sign that he or she has read these regulations. In the case of serious violations of responsibilities the user may be banned from the working area.

4.2.2 Working regulations

4.2.2.1 Attendance

1. *Laboratory open hours*

The laboratory encourages a five-day working week for undergraduate students with weekends off. However, the laboratory is open on weekends and you may attend work if you feel the need to and/or when required to by your supervisor.

2. *Working hours*

The normal working hours from Monday to Friday are 09:00 a.m. to 05:00 p.m. with one hour lunch break, and ten minutes coffee break in the morning and afternoon respectively. Lunch break is not taken during a specified time.

3. Time off

Occasionally you may require taking some time off during the course of a working day or you may wish to leave a little early. Whenever you feel the need to do so, please obtain prior permission of your senior/supervisor.

4.2.2.2 Discipline

1. Use of offensive/addictive substances

You **MUST NOT** smoke in the laboratory and this building, except in designated smoking rooms/areas, (if any). Chewing gum/tobacco during office hours and/or when doing experiment is also not permitted.

2. Non-official use of the laboratory's resources

We discourage the practice of using the laboratory's resources (office computers, phones, printers, stationery, servers etc.) for any personal purpose. If in the rare circumstance, you need to use these resources, please obtain prior approval from your supervisor. Such use must be duly recorded and paid for.

3. Custody of the laboratory's assets

You are responsible for the care of the laboratory's assets. Moreover, some students are given custody of assets such as keys, computers, and books etc. which must be returned the supervisor before proceeding to leave. You will be liable to compensate with replacement value, for damage/loss/theft of any items under your custody.

4. Working environment

An effective work environment is vital to the success of laboratory and office alike. Hence, it is not allowed playing computer games, poker etc. Moreover, food and drinks are not to be consumed at any time in laboratories.

4.2.3 Experimental regulations

4.2.3.1 Preparation

An experimental plan should be made before carrying out experiments. One must insure that no damage is caused to anyone, nor is anyone put at risk or interfered with more than the circumstances warrant by applying the work in such a way. Accessories which are prescribed for the protection of the user must be prepared (e.g. lab coat, safety goggles, pipetting aids, desiccators covers, and trolley for transporting gas cylinders). You should be well trained before starting any machines. You may only carry out work in accordance with the instructions given to you.

4.2.3.2 Carrying out experiments

When carrying out experiments, laboratory users must inform themselves of the risks and the appropriate protective measures by consulting the experimental regulations, operating instructions and handbooks. Safety advice given in the instructions must be observed.

Sources of danger, in particular puddles of water or oil films on the floor, must be removed immediately. Escape and rescue routes must be kept free from any obstacles and sources of danger. Any faults in the building, equipment or installations which represent a safety risk must be reported to the group leader responsible.

When carrying out work subject to a degree of risk the requisite safety gear must be worn, at least one person must be within calling distance, and all persons in the vicinity must be informed about the dangers and the protective measures that are necessary.

4.2.3.3 Equipment and chemicals

1. *Equipment*

The equipment in the Laboratory of Energetic Photonics is highly involved with high pressure, vacuum and high temperature. Thus, it requires particular care and cannot leave running without supervise. Equipment may only be used for the purpose for which is constructed.

Any self-constructed experimental equipment must undergo a safety check before being put into operation.

Pressurised gas cylinders may only be transported with the protective cap screwed shut and using special transportation trolleys. When in operation they must be secured so that they cannot tip over and be kept away from sources of heat. Pressure-reducing valves must be attached or exchanged only by an expert. Gas cylinders whose valves cannot be opened by hand must be appropriately labeled and removed from use.

2. *Chemicals*

Chemicals stored in the laboratory must be organised, clearly arranged and restricted to the necessary amount; combustible liquids for small-scale use may only be stored in containers with a capacity of a maximum of one liter. Larger quantities of combustible liquids can be stored in safes and in rooms specially designated and labeled for this purpose.

Containers must be labeled with a clear indication of the substance and in the case of hazardous substances with the requisite hazard warnings and symbols. The storage of chemicals in commercial food containers or drinks bottles is forbidden. Substances that are poisonous, highly toxic, carcinogenic, altering the genetic make-up, or are detrimental to fertility should be accessible only to experts or informed persons.

If flammable substances are stored in fridges, these fridges must be explosion-proof and labeled as such.

Chemicals which can give off gases or fumes which are hazardous to health must always be kept in a fume cabinet.

Suitable measures must be taken to avoid spillage when transporting and decanting chemicals. Spillages of liquid hazardous substances must be removed immediately in the proper manner. If necessary, any material used to absorb the substance must be disposed of as hazardous waste.

Chemicals available in the building, including any produced oneself, are to be used exclusively for research, teaching and training purposes. They must not be used for other purposes or removed from the building.

Combustible liquids may only be heated electrically using a return-flow cooler and a collecting trough and under constant surveillance.

Work involving the release of hazardous substances in the form of gas, steam, aerosol or dust must be carried out in a fume cabinet.

Skin contact with chemicals should be avoided. Protective gloves should be worn if required by the instructions pertaining to the substance.

Mechanical devices must be used when transferring liquids by pipette; using the mouth is forbidden.

3. *Safeguarding against water damage*

All equipment involving the use of cooling water must be connected to the internal cooling water supply and must be equipped with a water monitor, especially when operated automatically. The different water circuits (i.e. mains water and cooling water) must be kept separate.

4. *Electricity*

The electricity at the laboratory is energized at lethal voltages. Hence, never touch an exposed power line. Call the experimental officer to report the situation. Never operate electrical equipment while you are standing in water. Never repair electrical cords or equipment unless qualified and authorized. If working in damp locations, inspect electric cords and equipment to ensure that they are in good condition and free of defects, and use a ground-fault circuit interrupter.

4.2.3.4 Disposal of waste

A distinction must be made between normal and hazardous waste.

Chemicals which are not designated as hazardous may be disposed of with the normal waste or waste water. Hazardous waste must be collected in labeled special waste containers in accordance with instructions. Depositing waste in corridors, escape balconies or roof terraces is forbidden. The disposal of hazardous waste should be performed by senior technician.

4.2.3.5 Hygiene

After completion of work, the hands should be washed thoroughly before handling foodstuff. Keeping or storing chemicals in common rooms is forbidden. Lab coats that have been used in laboratories must not be worn in libraries, lecture theatres, seminar rooms or cafeterias.

4.2.3.6 Action to be taken in the event of fire or accident

Rescuing from danger areas those who are injured or stranded takes priority over other measures. First aid must be administered immediately to injured persons. And then informs the doctor on emergency call Ambulance **120**.

In the event of a fire, endangered persons must be warned and, if possible without endangering oneself, rescued. If the fire cannot be extinguished with the equipment provided (hand-held fire extinguisher, fire blanket etc.) without putting oneself at risk, the fire brigade 119 must be called immediately. If possible, further spreading of the fire should be prevented until the fire brigade arrives.

If uncontrolled amounts of gas, fumes, dust, solids or liquids of a substance which is injurious to health or the environment are released in a laboratory, all those present must be ordered to leave the danger area immediately. People in neighbouring areas must also be warned. The danger area must not be re-entered until the all-clear has been expressly given.

4.3 Health and safety regulation for RF labs (fire safety in anechoic chamber operation)

4.3.1 Purpose of the regulation

To provide guidance regarding fire prevention and procedures to be followed in case of fire during use of anechoic chambers.

4.3.2 Health and safety concerns about anechoic chamber

Anechoic chambers pose unique fire hazards. They are lined with various polymers, most of which produce dense smoke if ignited. Fires in such materials are very difficult to extinguish. Their smoke contains highly toxic gases such as hydrogen chloride (HCl), carbon monoxide (CO), toluene diisocyanate, and hydrogen cyanide (HCN) (the latter being absorbable through the skin as well as through inhalation). Besides the immediate danger of these gases, there is the possibility of death from pulmonary oedema (chemical pneumonia) 24 to 48 hours after exposure to HCl.

All anechoic chambers shall meet the design requirements and have the safety features and precautions described in this instruction. A fire inspector shall be assigned to an anechoic chamber to carry out fire safety responsibilities.

Design specifications for all new anechoic chambers shall be submitted for review prior to construction.

4.3.3 Definitions

An anechoic chamber is any device or installation in which quantities of polymers (e.g., polyurethane foam, polystyrene, polyvinylchloride, and nitrile rubber) are used to reduce electromagnetic wave echoes.

An anechoic chamber is generally located within a parent room.

4.3.4 Safety precautions

It is essential in preventing anechoic chamber fires to eliminate sources of ignition such as overheating cables or motors, welding, soldering, smoking, or anything that could produce the heat necessary for ignition of anechoic chamber material or of materials used inside the chamber; and to educate anechoic chamber personnel about fire hazards.

4.3.4.1 Safety signs

The following signs shall be posted:

1. At all entrances to buildings containing anechoic chambers, a sign stating:

"This building contains an anechoic chamber facility that shall produce lethal gases when exposed to fire. In the event of fire, evacuate the entire building."

2. At all entrances to a chamber, signs stating:

"No person shall work alone in this anechoic chamber if the operation poses an unusual fire hazard, or if the person is required to work at elevated heights or to perform some other type of work that exposes him/her to unusual safety hazards. In such situations, other personnel shall remain within voice and/or visual contacting order to summon help in the event of an emergency."

"Warning! This chamber is not designed for high-power density application."

"This anechoic chamber facility shall produce lethal gases when exposed to fire. In the event of fire, evacuate the entire building."

4.3.4.2 Safety features and precautions

The following safety features and precautions shall apply:

1. The annunciator panels for the fire protection system and the controls for the ventilation system shall be located outside the parent room so that personnel must not pass through heavy smoke to reach the panels or ventilation controls.
2. All fire locator controls and evacuation pull stations shall be located outside the hazardous area and as close as possible to the emergency exits.
3. Mechanical ventilation shall be provided to remove smoke in case of fire. The ventilation system should have the capability of removing smoke from the anechoic chamber or the parent room separately or at the same time. The objectives of providing ventilation are to remove smoke so that firefighters can see and to reduce smoke damage to the rest of the building.
4. If an unusual odour is noticed in the vicinity of the chamber, call for an evaluation. If smoke or fire is detected, call fire brigade immediately on 119; do not wait for an evaluation.
5. Electrically operated doors to chambers should have a remote control switch located outside the parent room.

4.3.4.3 Safety procedures

The following safety precautions shall be enforced by the anechoic chamber safety representative for each chamber:

1. Equipment shall not be left operating in the chamber while the chamber is unattended unless required for operational needs. If equipment is required to be left operating, it must be kept at least 3 inches away from the polymer lining, it must be positioned so that air can circulate freely around it, and it must not generate enough heat to feel hot to the touch.
2. Flammable or combustible liquids shall not be handled or stored inside the chamber unless absolutely required. Before starting repair operations using volatiles or solvents, or tests that involve the use of fuels, the chamber safety representative's approval must be obtained. Alcohol, commonly used to clean electrical components, should be replaced by nonflammable, non-ozone-depleting materials such as Genesolv 2004 or Inonox MC. If the use of flammable liquids is approved, personnel shall wear electrically conductive shoes or grounding straps to bleed off static electricity.
3. Sources of ignition shall not be permitted inside of or in the vicinity of the chamber except by special approval of the anechoic chamber safety representative. Extreme caution should be used when using soldering guns and high-intensity lights in the chamber. Portable fluorescent lights are cooler and should be used when portable lights are required. Oxyacetylene and arc-welding are prohibited inside anechoic chambers.
4. All polymer materials that are not installed in anechoic chambers shall be protected from becoming ignited. Such materials shall be stored away from electrical equipment, flammable liquids, welding and soldering operations, and other such conditions that may promote ignition. Preferably, loose polymer materials should be stored in metal cabinets with signs posted reading: "WARNING. This cabinet contains polymer materials that produce lethal gases when ignited or exposed to flames. Keep all ignition sources and flammable liquids away. In the event of a fire involving this material, call the fire brigade on 119 and evacuate entire building.
5. Before using electrical equipment in the chamber (including temporary flexible wiring or exposed

power supply terminals), the voltage between the chamber ground and equipment chassis shall be measured across a 10 ohm resistor. The voltage shall not exceed 0.5 volts.

6. If a current interruption device activates, all activity shall cease and the area shall be inspected before power is restored.
7. In the event that fire or smoke is detected, the first concern is for personnel safety. If possible, steps should be taken to contain a fire within the chamber to prevent involvement of the entire building. However, personnel should take no actions that would seriously endanger their personal safety. All personnel arriving at the scene of the fire should be advised of the hazard of breathing toxic gases and of the dangers of absorption of smoke through the skin. In case of fire, the procedures below shall be followed, in the order listed, by the personnel near the fire who presumably set off the fire alarm:
 - 1) Notify fire brigade on 119. Use automatic fire alarm if possible.
 - 2) Shut off all electrical power to the chamber, including lighting.
 - 3) Secure all ordinary doors to the chamber. (Any electrically operated door should be closed by the remote switch outside the hazardous area after determining that no one remains inside the chamber.)
 - 4) Evacuate all personnel from the building to a specified location to facilitate accounting for personnel. Chamber procedures should specify the meeting area.
 - 5) Actuate CO₂ suppression system if available. Water deluge systems should be actuated only by the order of the anechoic chamber safety representative.
 - 6) Evacuate all personnel from the building.
8. After a fire, the chamber should not be entered until permission has been granted by the safety representative.
9. Special precautions should be taken for some time after a fire since gases generated by the fire are readily absorbed on surfaces of the chamber. If the chamber has been closed for a period of time, toxic gas concentrations can build up inside. Chambers should therefore be ventilated continuously, and toxic gas levels should be measured before entering.

4.3.4.4 Anechoic chamber safety representatives' duties

An anechoic chamber safety representative has the following duties:

1. Review, within 90 days of assignment, fire safety procedures for all anechoic chambers under their responsibility to ensure compliance with the safety precautions. Include in this review the procedures for handling classified materials in the event of a fire. Prepare appropriate amendments to the safety procedures where necessary.
2. Ensure that all personnel working in their assigned anechoic chamber have been informed of the potential hazards of chamber fires and have received instructions on safe operating procedures and emergency evacuation procedures for the particular chamber.
3. Monitor the operations in the chamber to ensure compliance with safety procedures and regulations. Report violations to the HoD and H&S officers.
4. Ensure that all visitors are indoctrinated about the hazards associated with anechoic chamber fires prior to entry. This may be accomplished through an oral briefing, furnishing a briefing paper, or posting signs at each entrance.
5. Review and approve plans for new chamber operations that may pose unusual fire hazards. Develop additional fire safety measures, as necessary, that are consistent with the precautions

provided in this instruction.

6. Correct any hazardous conditions noted during periodic inspections.
7. Coordinate with H&S officers in planning and developing fire safety for new anechoic chambers, and modification/renovation of existing chambers.
8. Route all work requests and service calls involving maintenance or repair work in anechoic chambers.

4.4 Health and safety regulation for computer laboratories

4.4.1 General regulation at computer laboratories

4.4.1.1 User's rights

Using electronic media and internet resource is the basic right of every staff member and student. The University expects that everyone using these resources should act in a responsible and accountable manner.

University has the rights to modify any of the guidelines and/or regulations and can refuse, restrict, cancel or expand the rights of using these resources.

4.4.1.2 Appropriate and inappropriate use of computers in the computer laboratory

Students can use the electronic data and network resources provided in the laboratory (e.g. network connections, online learning systems, electronic library and computer laboratories) for learning and related activities. However, users must follow the regulations and guidelines as stipulated in this document.

An illustration of appropriate or inappropriate use of computers in the laboratory is given in the following. Please note that they are not deemed to be exclusive.

1. Appropriate use of computers in the laboratory

- Scan your files with anti-virus software before you forward them, or when you receive them via email.
- Keep your username and password secure at all times! Never let anyone use them and avoid being known by others accidentally. You should not use passwords that are easy to guess, and should change your password periodically.
- Keep all usernames issued by the University in a secure manner.

2. Inappropriate use of computers in the laboratory

- Composing, transferring, executing or saving messages, images, programs or data containing bad intentions, threatening, annoying, obscene and/or indecent materials.
- Commercial and profit making activities unrelated to the University.
- Sending out email or a program that can be self-duplicated or cause damage to other users' accounts (virus-like activities).
- Sending out hoax information, including disguising oneself as another user.
- Violating the safety regulation or destroying computer systems of the University.
- Copying / transferring software or materials that are copyrighted.

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- Checking, processing, viewing or trying to view another user's electronic information without prior approval.
 - Building connections to systems outside the University network, which allow non-XJTLU users to access the University systems. For example, web, FTP server or SSH services on a laboratory PC.

4.4.2 Health and safety regulation at computer laboratories specifically for students

More specifically, SAT students are required to follow the H&S regulations below while attending a computer laboratory.

1. Students may only use the computer laboratory for academic related activities.

- Only studying, academic research and related activities are allowed in the laboratory. Avoid other non-related activities, such as playing computer games and online shopping in the laboratory.
- Students must not access inappropriate material from the Internet.
- Students must not send, receive or display offensive messages, images, or materials.
- Students must not access any computer or data without permission.
- Users should not leave computers unattended and idle for a prolonged period of time.

2. Students are responsible for all actions done on their computers.

- Students must only log onto their own user account.
- Students must log off their computer accounts when they are finished.
- Students should inform the teacher of any observed hardware or software failures.
- Students should NOT leave any belongings unattended.

3. Students must respect all other students using the computer laboratories.

- Students must keep their work area clean and orderly.
- Students should not use computers to create undue noise or music that may disturb other users.
- While discussion is encouraged, please keep your VOICE DOWN. No disturbances should be caused to other users in the laboratory.
- Students must not interfere or tamper with anyone else's work on computer.
- Students must not disrupt, or harass other students in the lab.
- Students should inform the teacher of any observed misbehaviour or vandalism.

4. Students must not plagiarise material from the Internet or other resources.

- Students must not submit another student's academic work as their own.
- Students must not use or copy any unauthorised software or data.

5. Students must not misuse or abuse the computers or other resources.

- Students must not bring food or beverages into the computer labs.
- Smoking is strictly prohibited in the labs.
- Students must not reserve seats with personal belongings.
- Students must not remove equipment or other items from the computer labs.
- Students must not disrupt the computer systems or networks.

Appendix-I: Health and Safety Agreement Form of SAT

It is the policy of the School of Advanced Technology (SAT) to take all reasonably practical steps to ensure the safety, health and welfare of all employees and students in SAT. To achieve this, everyone has a duty to co-operate by following the *Standard Operating Procedures* and *Health & Safety Rules* laid down by the University and this School as set out in the *School Health and Safety Manual*.

Suggestions regarding the improvement of health and safety practices within the school are welcome and should be submitted to Health & Safety Officer in writing. If any unanticipated hazard is identified, the Safety Officer **MUST** be consulted prior to commencing an activity. All accidents and incidents **MUST** be reported to the School's Health and Safety Officer and recorded in the Accident and Incident book.

Students involved in experimental classes in the laboratories of the School of Advanced Technology **MUST** attend a *Health and Safety Induction* **BEFORE** starting any laboratory work.

Part 1: Student information

Student name (English)		Student ID No.	
Student name (Chinese)		Gender (F/M)	

Part 2: Medical information

Do you have any known medical condition which might affect your participation in the laboratory work? Yes/No, If yes, please indicate:

- eczema
- epilepsy
- antibiotic sensitivity
- hyperallergic reactions
- infectious disease (e.g. COVID-19)
- others: _____ (Please indicate)

Part 3: Declaration

I, (PRINT ENGLISH NAME) with ID number
(PRINT STUDENT ID NUMBER), have attended the Health and Safety Induction conducted by the School of Advanced Technology, have read the School's Health and Safety Handbook, understand my obligations, agree to carry out my work in accordance with them and agree to keep up to date regarding safe operating procedures.

I declare that the information given within this Health and Safety Agreement Form is true and complete to the best of my knowledge.

..... (SIGNATURE) (DATE)

Appendix-II: Information Form of Experimental Module

This form is to be completed by the module leader prior to the start of the module. One copy of the document is to be kept by the Department Health and Safety Officer.

Part 1: Basic Information

Module code:	
Module title:	
Academic year:	
Academic semester (1/2):	
Level (0/1/2/3):	
Credit:	
Number of students registered for this module:	

Part 2: Module leader and contacts

Module leader's name:	
Position:	
Email:	
Telephone:	

Part 3: Risk assessment

Main risks of the experimental work
Emergency procedures

Part 4: Signatures

Supervisor's name (print):.....

Supervisor's signature:

Date:

Appendix-III: Accident and Incident Report Form

This form must be filled in by an employer or other responsible person.

Part 1: Reporter information

Name:	
Position:	
Department:	
Office:	
Telephone:	
Email:	

Part 2: About the incident

On what date did the incident happen?	
At what time did the incident happen?	
Where did the incident happen?	

Part 3: About the injured person

Name:		Position:	
Age:		Gender: Female <input type="checkbox"/> Male <input type="checkbox"/>	
Home address and postcode:			
Home phone number:			

Part 4: Describing what happened

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Part 5: Signature

Chinese name (print):.....

English name (print):.....

Signature:.....

Date:.....