Department of
Mechanical Engineering
香港城市大學
City University of Hong Kong

Department of Mechanical Engineering

USER HANDBOOK OF

MECHANICAL ENGINEERING LABORATORIES

Year 2025-26

User handbook of
Mechanical Engineering
Laboratories
City University of Hong Kong

FOREWORD

On behalf of the Department of Mechanical Engineering (MNE), I would like to welcome you to use our facilities. This handbook is intended to provide all the basic information about our facilities and services. The handbook will give you an overview of the organization and operation of the Mechanical Engineering Laboratories (hereafter the LAB). It will also provide the general safety regulations and guidelines, a brief description of each individual laboratory area, and a summary of the services available from the LAB. Through the information provided by this handbook, we hope that you can make the best use of our services. Embracing the spirit of continuous improvement, we welcome any suggestions to improve the quality of our services.

If you are a regular user of the LAB, please kindly take some time to read through the handbook and fill in those forms that are relevant to you and send it back to the Laboratory Office (Room B1664). Should you have any further queries about the LAB, please feel free to contact the helper or staff in Room YEUNG B6614 or call 3442 8358.

On behalf of all our technical staff, I wish you every success in using our facilities for your research or study.

Mr. Wong Kwok Wai
Chief Technical Officer,

May 2025

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A. Mission and role of the Lab

Mission

To provide state-of-the-art facilities, world-class technical support and a safe green working environment for university teaching, research, training and industrial consultancy work.

Roles

1. To support MNE Engineering Students' experiments and laboratory exercises,
2. To provide facilities and technical support for MNE Engineering Students to undergo final year projects,
3. To provide a simulated factory environment for MNE Engineering Students to undergo practical engineering trainings,
4. To provide facilities and technical support for research and development work,
5. To support the Departmental and University wide publicity work.

B. Introduction to the Lab

As undergraduate and postgraduate programs expand, the array of equipment within the Mechanical Engineering (MNE) Laboratories is also steadily growing. A lot of precise equipment with advance technology are installed in our Lab. The majority of MNE facilities are located on:

- 1st floor, 2nd floor and 7th floor of Yeung Kin Man Academic Building (YEUNG),
- 6th floor of Li Dak Sum Yip Yio Chin Academic Building (LI).
- 3rd and 5th floor of Lau Ming Wai Academic Building (LAU)

The total floor area for teaching and research laboratories is over 2,439 m^2. They are briefly described below:-

Some major Teaching Laboratories:

1. **Computer-Aided Design (CAD) Laboratory (Rm. YEUNG P7540 , 120 m^2)**
   This laboratory is equipped with about 45 top level PCs that are installed with Computer Aided Design/Computer Aided Manufacturing (CAD/CAM) software systems. The facilities are mainly used to support the teaching and experimental works in CAD/CAM/CAE applications and developments. The laboratory is also used to support Departmental activities such as seminars and conference, Manufacturing Projects, etc. Students not only learn to use commercial CAD/CAM systems, but also learn to implement CAD/CAM algorithms in a proprietary CAD system developed by the laboratory. The software equipped in this laboratory includes AutoCAD, SolidWork , SolidCAM, and Pro/E.

2. **Mechanics and Tribology Laboratory (Rm. YEUNG B7410, B7412, 54 m^2)**
   This laboratory is mainly designed to support the teaching of basic mechanics and fundamental machine design courses. It is fully equipped with standard apparatus for students to perform experiments on kinetics, kinematics, mechanisms, vibration, stress and strain analysis etc. This laboratory also supports student centred activities (SCA) which involve the solution of basic mechanical design problems using the practical and theoretical knowledge that they have acquired from this laboratory and from lectures respectively. Furthermore, the laboratory also contains some commercial and self-developed tribological apparatus for the study of lubrication, friction, wear, roller and journal bearings.

3. **Thermal fluid Laboratory (Rm. YEUNG B7414, B7416, 54 m^2)**
   This laboratory is established for supporting the teaching of basic and advanced thermal fluid courses. These laboratories are essential for understanding how energy and fluids interact in various systems, and they provide a controlled environment where researchers and students can conduct experiments, collect data, and validate theoretical models.

4. **Basic Training Workshop and Fabrication Laboratory (Rm. YEUNG B1481, 97 m^2)** The laboratory is equipped with basic workshop machines, tooling and workbenches. The facilities are mainly used to support the teaching of practical training to students, such as Engineering Workshop Practices (MNE2020). This workshop can also support the fabrication and testing of mechanical devices and systems for various final year project work and applied research work.

5. **Advanced Machining and Materials Processing Laboratory (Rm. YEUNG B1721, 97 m^2)** This laboratory is designed to provide experimental facilities in the field of sample material coating, metal forming, and heat treatment of materials. Several of the machines installed in this laboratory, such as Cold Rolling Machine, CNC Wire-cut Machine, CNC EDM Machine, E-Beam machine,

Sputtering machine and Expanded Plasma Cleaner. This laboratory is thus therefore capable of supporting teaching and research activities related to material science, tribology and precision engineering parts fabrication as well.

6. **Product Safety and Hazard Analysis Laboratory (Rm. YEUNG Y1421, 59 m^2)**
   This laboratory is established to support laboratory teaching/final year project works and related researches in testing of products regarding health, safety and environmental standards. Major equipment of the laboratory include : X-ray fluorescence spectrometer (XRF), Fourier Transform Infrared Spectrometer (FTIR), and UV/VIS Spectrophotometer.

7. **Metrology Laboratory (Rm. YEUNG Y1625, 72 m^2)**
   This laboratory is purposely built on a floating concrete slab. It is designed in accordance with the advice from the National Physical Laboratory (NPL) of UK. All the fixtures in the laboratory are isolated and a separate air-conditioning system is installed to provide a vibration free and adequately clean environment with appropriately stable humidity. Various precision measuring instruments such as the laser interferometer, atomic force microscope (AFM), scanning electron microscope (SEM), nano-grade optical surface profiler, nano-indentor, surface texture tester and roundness testing machines are installed. This laboratory is mainly used for the support of teaching and research in engineering metrology.

8. **Control and Instrumentation Laboratory (Rm. LI 6502, 81 m^2)**
   This laboratory is established to facilitate experiments in automatic control and the associated instrumentation applications. It is fully equipped with a wide range of signal processors, oscilloscopes, PID controller, feedback control system, single board computer systems, etc. Various PC-based development software in fuzzy control, neural network control, etc are also available to support the experiments and student projects in advanced control engineering technology.

9. **Service Robotics Laboratory (Rm. LI 6503, 67 m^2)**
   With the advances in technology, a wide range of services such as windows cleaning, pipe inspection, automatic vacuum cleaning, surgery, health care and entertainment, can now be carried out by intelligent machinery or robots. The objectives of this laboratory are to demonstrate and promote the use of service robots in manufacturing, processing and services enterprises (including SMEs); to provide training and teaching support in the development and use of service robots; to widen the possible applications for such machinery; and to provide research infrastructures for developing service robots;

10. **Mechatronics and Automation Laboratory (Rm. LI 6505 LI, 152 m^2)**
    This laboratory aims to support teaching and research activities in mechatronics and automation. Facilities include multi-axes articulated robot, SCARA robot, vision systems, and simulation software for automation systems. The lab is also equipped with apparatuses for teaching traditional automation.

11. **Integrated Design and Prototyping Laboratory (Rm. LI 6506, 68 m^2)**
    This laboratory is equipped with advanced equipment for integrated design, digital geometry processing, virtual prototyping, reverse engineering and rapid prototyping activities. The basic equipment include one set of Kreon laser scanner, one set of J850 Pro3D printing machine from Stratasys, one set of BMF NanoArchS130 Printer for precision resin printing and one set of 3D Bio-Architect Work Station from Regenovo. Major software include Inus RapidForm and SDRC/ Imageware Surfacer software for reverse engineering, Materialise MIMICS software for medical model prototyping, Materialise Magics software and SDRC/Imageware RPM module for rapid prototyping, Sense8 lab license for virtual reality (VR) applications,

ACIS and Designbase geometric kernels, Autodesk Maya, Unigraphics, Catia, and other geometric and mathematical libraries. The laboratory provides support to a number of courses and regular final-year projects. It also provides industrial support on integrated design and prototyping, and support to ongoing research activities on digital geometry processing, virtual prototyping, reverse engineering and rapid prototyping.

12. **Nuclear Reactor and Flight Simulation Laboratory (Rm. LAU 5201, 150 m^2)**
    The laboratory supports the teaching of the Nuclear and Risk Engineering Major and the Aerospace Engineering program. It is equipped with a state-of-art full scope nuclear reactor simulator based on a commercial 3-loop Pressurized Water Reactor designed by Westinghouse in the USA. It also equipped with 3 sets of virtual panels for human factors research, CATHARE for design-basis accident related studies, and MAAP and MAAP Dose for beyond design-basis accident related research. It also equipped with a Flight Simulator which simulates the Airbus A320 flight system and is customized to meet the actual needs for education of aerospace engineering program. Students will learn the aircraft systems and basic operation of an Airbus A320. The simulator also provides Malfunction Training / Abnormal and Emergency Procedures.

13. **CLP Power Low Carbon Energy Education Centre (University Level Initiative hosted by MNE, Rm. LAU 3202, 300 m^2)**
    The Centre supports undergraduate teaching, especially general education and nuclear engineering related courses. The centre is divided into 5 thematic zones to provide a thought-provoking, interactive experience covering the generation principles, applications, advantages and limitations of different low carbon energy sources (including, solar, natural gas, wind, hydro, and nuclear energy) as well as their future development potential. One of the main teaching equipment is the state-of-the-art 235° 3D Immersive Virtual Reality Display System that can take visitors for a virtual tour of the insides of Daya Bay Nuclear Power Plant.

Some major Research Laboratories:

1. **Advanced Coatings Applied Research Laboratory (ACARL, Rm. YEUNG Y1431)**
   The application of diamond and diamond-like carbon (DLC) thin firms has recently attracted a lot of attention in the US, Europe, Japan, South Korea, Taiwan and Singapore. Diamond coatings is a surface coating which can be applied on plastic, glass, ceramic and metal at close at room temperature with its properties rivalling those of nature diamond, but it cost much less. By the supporting of the ISF project, HKSAR Government, ACARL using the existing R&D facility in the laboratory to adapt and improve on the coating techniques and processes for local industrial applications. Besides we intend to produce ready-to-market results of DLC applications by achieving three objectives: to serve as a pilot facility to adapt diamond coatings to various metals, glasses and plastics to improve their hardness, wear and scratch resistance qualities; to provide diamond coating service to specific products from local industries once the coating technique and process for those specific products are finished; and to develop new applications of diamond coatings, and diffuse and promote this technology to local industries.

2. **Bio-Inspired Engineering Laboratory (Rm. YEUNG Y1522/Y1532)**
   Through billions of years of evolution, Nature has orchestrated many elegant principles to accomplish structural and functional integrity. The overarching visions of this laboratory are to advance our understanding of various important interfacial and transport phenomena underlying the multiscale natural system and to mimic these biological principles for healthcare and energy

innovation. Some major equipment of the laboratory include DKSH contact angle measurement system, fluorescence microscope, high speed camera (up to 10,000fps).

3. **Nanomaterials for Energy Storage & Energetics Laboratory (Rm. YEUNG Y1414)**
   This lab is for synthesizing nanomaterials for energy-related applications, especially for energy storage and energetics applications. The lab is capable to synthesize and characterize various 0D nanoparticles, 1D nanowires/rods/tubes, 2D nanowalls/ sheets/ plates, and complex 3D hierarchical nanostructured materials. This lab has the state-of-the-art facilities for testing the electrochemical properties of the synthesized nanomaterials for energy storage applications such as lithium-ion batteries (LIBs) and supercapacitors. The lab is also capable to test the thermal, combustion, and mechanical properties of nanoenergetic materials. Nanoenergetic materials have promising applications in airbags, belt tensioners, mining, deconstruction, heat sources for rapid fuses, the joining of materials by means of localized heating, micropropulsion systems, and propellant rate modifiers.

4. **Nanomechanics and Materiomics Laboratory (Rm. YEUNG Y1504)**
   The multi-scale in situ mechanical characterization laboratory is established for the holistic study of materials systems, including low-dimensional nanostructures and biological materials, and its applications in advanced materials processing and bio-inspired materials design. Major equipment housed in the laboratory include: in situ SEM tensile tester with 2N, 20N and 200N load cells; MicroManipulatorTM probe station; Electrochemical nanofabrication system; in situ SEM picoindenter (CASM); high resolution in situ micro-imaging system, etc. By synthetically using the experimental and computational approaches, such as in situ electron microscopy (SEM, TEM) techniques, mechanical (as well as electro- and thermal-mechanical) properties and deformation mechanisms of natural and synthetic materials can be systematically investigated in the laboratory, to provide fundamental links between structures and properties at multi-scale, from nano to micro to macro, and under multi-field.

5. **Nano-Materials and Mechanics Research Laboratory (Rm. YEUNG B1551)**
   This lab aims to develop the Surface Mechanical Attritions Treatment (SMAT) Technology, which offers an attractive alternative approach to effectively produce nanostructured surface layers on materials. SMAT does not alter the chemical composition of the treated material but can increase its mechanical properties, such as tensile strength and hardness. A high strength and high ductility steel is designed on the basis of a newly developed concept of coherent twin boundaries to meet the demands of safety and lightweight design for the automobile and aeronautic industries. The high density twin structure on the nano/submicron scale not only can induce higher strength, but also provide large ductility by the interaction of dislocation with coherent twin boundaries. The high density twinned steels, with twin thickness on the nano/submicron scale in bulk materials shall be fabricated by surface mechanical attrition treatment (SMAT) with high impact velocity. The mechanism of strain-induced twin by high speed impact is investigated to achieve controllable performance. The relative application of corrosion resistance, welding, and friction and wear properties will also be studied.

6. **CASM Photo-Mechanics Laboratory (Rm. YEUNG B1555)**
   The composite laminate in airplanes has been applied in the new airplanes and the proportion is continually increasing. The Surface Mechanical Attrition Treatment (SMAT) and nitriding process greatly improve the corrosion resistance of the fuel rod under multiphysical coupling complex system, i.e. vibration induced fluid structure coupling and irradiation, corrosion and mechanics coupling. The SMAT induced surface compressive prestress also effectively improves service life of the fuel rod under cyclic loading. To achieve those objectives is the experimental measurement

of residual stresses in composite laminate parts. Among the different techniques existing for residual stresses characterization, the incremental hole drilling method is developed and coupled with optical instrumentations (ESPI, Moire Interferometry).

7. **Robot Vision Research Laboratory (Rm. YEUNG Y1412)**
   The work in this lab is on robot vision in general and is on 3D visual sensing and tracking recently in particular. Some of the recent works conducted include: 3D visual sensing with structured lighting; Active visual sensing with self-recalibration; Sensor Placement for 3D Measurements and Reconstruction in Uncertain Environments; Omni-Directional 3D Visual Sensing; Tracking with 3D vision; 3D trajectory tracking for activity observation, etc. The relevant applications include advanced product inspection, surveillance, as well as robotics.

8. **Integrated Nano/Bio Systems Laboratory (Rm. YEUNG Y1513/1515)**
   This lab focuses on the integration of MEMS, Nanomaterials, DNAs, and Cells for advanced applications in sensing and biomedical engineering. The research team currently emphases on using digitally-controlled and programmable electric fields in microfluidic systems (optically-induced electrokinetics or 'OEK') to manipulate, assemble, pattern, and differentiate cancer and stem cells. OEK is also being applied by the team to rapidly fabricate micro-lens arrays for the development of large-area scanning near-field microscopy (SNOM). Work is also underway in the lab to use micro-nozzles for rapid printing of 3D biological tissues.

9. **Mechanics of Advanced Structural Materials Laboratory (Rm. YEUNG Y1526)**
   The Mechanics of Advanced Structural Materials Laboratory is established for the fundamental study of the structure-property relation of advanced structural materials, including deformation, fracture and fatigue. The materials we are concerned with include amorphous alloys, high temperature alloys (such as high entropy and super alloys), bulk nanocrystalline materials, flexible electronics materials, thin films and structural biomaterials. Major testing equipment housed in and related to the laboratory includes: Fullam in-situ microtester and HysitronTM TI 950 nanoindentation system. In addition, the research in this lab deeply involves design and synthesis of advanced structural materials, which links it to the fabrication of advanced structural materials. Besides experiments, this lab is also devoted to micromechanics modeling and numerical simulations, from finite element to molecular dynamics simulations.

C. The Lab organization

The LAB is managed and operated by a team of 13 experienced technical staff on a daily basis headed by the Chief Technical Officer. The entire Laboratory is supervised by the Laboratory Management Committee (LMC) which oversees the long term planning and development of the Laboratories towards achieving the Department mission and vision.

1. Laboratory Management Committee (LMC)

   The role of LMC is to contribute to :-
   - Planning and development of the Laboratories towards achieving the Departmental mission and vision,
   - Planning of laboratory space utilization to support various academic and professional activities of the department,
   - Coordinate the planning and use of equipment and consumable budgets
   - Oversee the general safety, environmental and hygiene standards in laboratories,
   - Oversee the allocation and utilization of resources in the laboratories,
   - Oversee the quality level of various services provided by the laboratories.

   The composition of LMC consists of a Chairman, who is appointed by the Head of Department, the Chief Technical Officer, and 3 members nominated amongst all faculty members.

2. Operation of the LAB

For the effective operation of the entire MNE laboratories, all the technical staff shall work together to provide the timely and necessary services to their users, including academic staff, research staff, undergraduate students and postgraduate students, etc. In general, one technician is assigned to look after the daily operation of at least one individual teaching laboratory area.

The roles of the technical staff are mainly to:-

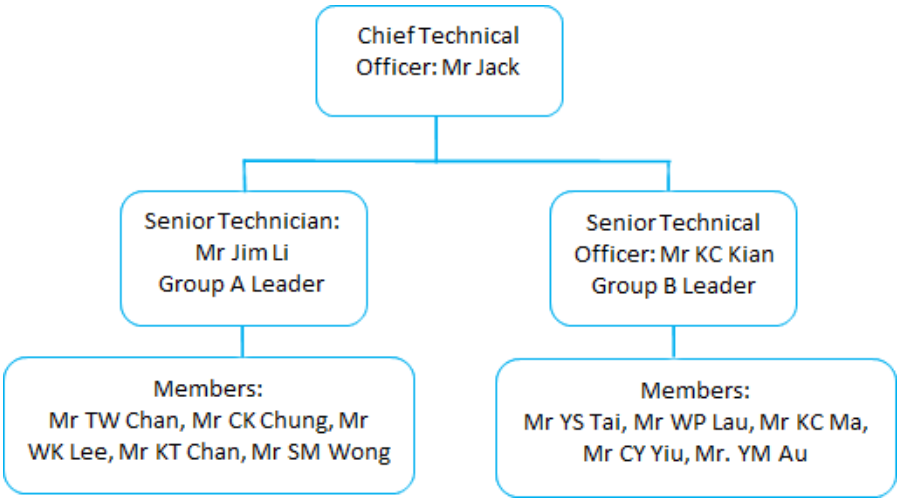
- assist the planning and develop laboratory exercises,
- support the running of laboratory exercises, i.e. :-
  - Prepare necessary equipment and accessories for the running of exercises,
  - Demonstrate the operation of equipment/software systems to students,
  - Ensure the students' safety in operating the equipment, etc.
- support students in working on final year projects , i.e. :-
  - Demonstrate the operation of equipment and use of software systems to students,
  - Provide adequate technical guidance where appropriate,
  - Assist students on the sourcing and purchase of necessary equipment/accessories, etc.
  - Ensure the students' safety when working in the laboratory.
- support Departmental research and industrial services , i.e. :-
  - Conduct risk assessment with RA and PhD students for major teaching equipment,
  - Provide basic operation training of the teaching equipment and its safe operations,
  - Assist the PI to maintain the research lab in good condition and maintenance of some major common research facilities
  - Conduct industrial consultancy work request on a needed basis
- support the Laboratory office to :-
  - Maintain the individual laboratory area clean , tidy and safe,

- Maintain the equipment and facilities in good condition,
- Maintain records of various laboratory activities for efficient management,
- Achieve and fulfill the LAB's mission to its greatest extent.

In general, most of the teaching equipment in the LAB are purchased and setup to support laboratory exercises, student projects, research work and sometime industrial consultancy work. When there are more than one user who want to use a particular equipment at any one time, priority will then be given based on the above order. Final year project students will usually be given a fixed workplace to work with at the start of their project. They are allowed to enter the LAB during daytime and operate the computer or equipment as long as they have informed and agreed by the technical staff and those equipment are not occupied by any laboratory exercises. However, for those potentially dangerous equipment such as industrial robots, machine tools, chemical analysis apparatus and high power equipment, students need to be accompanied by their supervisors(or their delegates) or technical staff.

The overall smooth operation of the LAB and its continuous growth is under the supervision and management of the Laboratory Operational Management Team which is headed by the Chief Technical Officer (CTO) and assisted by the two senior technical officers. The CTO shall oversee the Safety and Security, Fixed Asset Management, Time-tabling and Roster, as well as consumables support for the entire Lab. He is also responsible for the development of supporting infrastructure including the Quality Enhancement Programme, the Safety Enhancement Programme, liaison with the Finance Office for the purchase of teaching equipment, and with the CDO/FMO for the maintenance of basic services in the LAB.

2. Lab Staff Organisation



D. Safety in the Lab

To prevent accidents occurred in the LAB, all users (including students, research assistants, and research students) are required to read carefully and follow exactly the following regulations and safety guidelines when they are working in the laboratories. If found violating these regulations and safety guidelines, they may be asked to leave the laboratories or stopped from entering the laboratories.

****IMPORTANT****

– EXPERIMENTS WITH POTENTIAL FIRE RISKS SHOULD NOT BE LEFT UN-ATTENDED.

– EXPERIMENTS WITHOUT RISK ASSESSMENT AND ADEQUATE SAFETY MEASURES SHOULD NOT BE PERFORMED.

– UNDERGRADUATE STUDENT CAN ONLY WORK IN A SPECIFIC LABORATORY AFTER OBTAINING PERMISSION FROM A QUALIFIED MNE STAFF WHO IS READILY AVAILABLE IN DEPARTMENT'S LABORATORY THROUGHOUT THE TIME OF USE.

a. GENERAL BEHAVIOUR AND ATTITUDE

1. While in the LAB, you are not allowed to smoke, to bring in food to eat and to drink, to cook, to sleep, to gamble or to play games, and you should always dress up appropriately in accordance with the safety regulations. (DO NOT wear shorts, shirt, sandals or slippers in laboratory)

2. You should always be considerate and do not disturb others by rowdy action or by unusual noise.

3. Unless otherwise permitted,
   - 3.1 do not stay in the LAB after office hours;
   - 3.2 do not take anything belongs to the LAB (such as tools, instruments, manuals, equipment, furniture etc) away from the LAB;
   - 3.3 do not dislocate any equipment or furniture;
   - 3.4 do not operate machines or equipment of any kind in the LAB.

5. After you have finished your laboratory experiment or your student centre activity or your project works, clean and tidy up your workplace and return all borrowed equipment and tools to the technicians before you leave.

6. In case of accident or damage to a machine or equipment, you should immediately stop using it and report to the technician-in-charge about the accident or damage.

7. In case of fire, switch off the power supply and leave the LAB orderly through the nearest exit door.

8. If you want to carry on with your research investigation after office hours, you should seek advice from the Chief Technical Officer for a proper arrangement to ensure your safety.

9. You should immediately report to the technician-in-charge any malfunction of any equipment or machine. Never attempt to investigate the causes and/or solve the problems on your own.

10. You are fully responsible for your own safety in using the LAB facilities.

b. USE OF CHEMICALS

From 27 July 2020 onward, purchase of controlled chemicals must be made via Chemical Control System (CCS).

The benefits of CCS are:

- Cloud-based chemical order and inventory control system
- To manage the purchase and stock keeping of chemicals on campus in order to meet statutory requirement
- To monitor chemicals stock level
- To minimize effort in compiling chemical inventories
- To provide better bargain and time saving for purchase of commonly used chemicals/solvents utilizing Blanket Order

Principal Investigators:

- appoint the full-time staff/students as Chemical Purchasing Delegate to handle all chemical purchasing issues including obtaining quotations, applying relevant licenses and raising order requests in Chemical Control System (CCS) on behalf of his/her research group;
- undertake the ultimate responsibility for his/her order requests and fulfill relevant statutory requirements;
- take appropriate action against any person who violates statutory requirements;
- be well aware of any hazardous chemicals or controlled substances to be purchased before raising chemical request at CCS;
- settle the payment with FO and FMO.

For further information about CCS, you may visit FMO's website on Safety and Health Information under the Safety, Health and Environment menu:

https://www.cityu.edu.hk/fmo/studentlan/default.aspx?PageID=shi

There are a lot of Chemicals require very special infra-structure before we can use / store it safely, and also some of them may require special approval from Hong Kong Government as well.

1. You must read and understand the operation instructions of the machines and the processes before operation. When in doubt, you should ask the technician-in-charge for help.

2. You must follow all operation instructions closely during the operation.

3. You must wear suitable protective clothing, gloves and face goggles or mask while working in the chemical related laboratories, including the Product Safety & Hazard Analysis Lab.

4. If you are operating a machine or in a process involving chemicals, you must understand the nature of these chemicals, study its MSDS and the necessary precautions to be taken before operation.

5. You must handle all chemical substances with great care. When in doubt, you should ask the technician-in-charge for help.

6. You must keep all chemical containers tightly closed, dry and clean, and in proper position. After using them, you must put them in an appropriate place. Please study carefully and follow the

Chemical storage guidelines and Chemical Waste disposal guidelines which can be accessed under the Lab website http://www.cityu.edu.hk/mne/lab-safety.htm

7. You should perform chemical operations in a fume hood whenever it is possible.

8. If you suspect an abnormal gas or chemical leakage, you must report to the technician-in-charge immediately and then leave the area quickly and orderly. DO NOT attempt to tackle the leakage on your own.

9. You should not dispose of chemical wastes to the public drainage system. You should ask the technician-in-charge the proper disposal procedures for chemical wastes. See Appendix III for the Chemical waste disposal guideline for the Department.

c. USE OF ROBOTS

1. You must obtain briefing from the technician-in-charge on the proper operational procedures of a robotic system before you operate it.

2. You have to sign a form and collect the key from the technician-in-charge to operate a robot.

3. When you are testing a new program on a robot, you should always start with the slowest speed to make sure that the whole sequence of motion is complete and no obstruction to the robot movement exists inside its working envelope.

4. Before entering the working envelope of a robot, you must switch off the arm power and wear a safety helmet.

5. When a robot is activated, you should never cross the safety yellow line marked on the floor, and you should never alter any electrical/electronic connections of the robotic system.

6. When a robot is switched on, you should never leave it unattended.

7. Command a robot to its home position then switch off the power and return the key to the technician-in-charge before you leave.

d. USE OF LASERS

1. User must read and fully understand the comprehensive laser safety guidelines issued by Electrical and Mechanical Services Department (EMSD) of Hong Kong Government, which can be accessed from Departmental homepage at www.cityu.edu.hk/mne/lab-safety.htm

2. User must attend and complete the LS-08 Laser Safety on-line training provided by CENG.

3. For use with class 3 laser or above, user must also attend the 3.5 hours training course "Fundamentals of Laser Safety" offered by Occupational Safety & Health Council, or equivalent,

as soon as it is available. The LAB will inform the user and do the application and registration of the course for the staff when it is available.

4. Whenever the laser source is turned on, users must not leave it un-attended at any time.

5. Laser equipment is classified into different class from 1 to 4, usually depends on the power of the laser source. It is marked and labelled clearly on the equipment. User must fully aware of the class of its laser source.

6. For laser of class 3 and class 4, they are of high power and shall have potential hazard to the eye if it is exposed to the laser source. For high power class 4 laser, it also possesses potential hazard for skin burn and fire hazard.

7. As such, when operate with such high power laser, user shall always wear laser goggle with suitable wavelength and wear lab cloth to protect possible skin burn.

8. More importantly, for laser of class 3b and class 4, designated controlled area should be used to house, and separate the laser equipment from outside. Warning sign should be used so that other people will not enter the designated area whenever the laser is turned on. User of class 3b and/or 4 laser must seek the approval from Laboratory on the setup of the designated controlled area before it can be used.

9. In CityU, procedure is also established such that regular laser user shall conduct an eye sight test from a registered eye doctor before they operate the laser and prior to their end of their contract with CityU. Please check it with our Laser Safety coordinator ***Mr YIU Kelvin Chi Yan (Tel: 3442 8026)*** and get the eye sight test completed before commencing any laser operation.

10. High power laser source, class 3 or above possess fire hazard when the laser has a chance to emit to the open air. In this case, users should make sure that the environment near the laser source is clean and tidy, does not have any flammable materials such as paper, and paper box. Do use plastic box, (or glass box) to cover and shield the laser source so that it will not emit out. Such box should be painted with black/dark color so as to absorb the laser source as much as possible.

e. USE OF COMPUTERS

1. You should keep all pirated software away from your computer systems as well as from the LAB. Any software without proper license will be removed from your systems immediately without further notice.

2. You can use any PCs that are not being occupied in the LAB provided that you have informed the technical staff in charge. However, priority has to be given to laboratory staff for urgent uses.

3. You should make sure that the data storage device are free from any virus before using it.

4. Unless otherwise permitted,
   4.1 you are not allowed to install any software of your own in the hard disk drive;
   4.2 you are not allowed to copy any software installed in a PC.

5. You should never delete or modify any file from the hard disk that are not yours, and you should always backup your data and then switch off the PC before you leave.

6. You should not lock the computer screen for more than 15 minutes.

7. In case the PC has to be re-located or re-formatted for other purposes, thus necessitating the deletion of files in the hard disks, you will be given a few days' notice to save your files.

f. USE OF LOCKERS IN LABORATORIES

You are not allowed to carry bags to the laboratories. To provide a temporary storage for your bags and belongings when you enter the laboratories for experiments, project, etc. Lockers (without locks) are provided at the main entrance of the Laboratories. Please follow the below guidelines for the proper use of the lockers.

1. Bring your own personal locks and lock your bags whenever you enter the laboratories.

2. Always clear the lockers and get back your personal locks every day when you leave the laboratories.

3. Never leave your belongings in the locker overnight or else our staff will break the locks and empty the lockers.

4. Never leave your wallet or any expensive belonging in unlocked lockers.

g. MANUAL HANDLING OPERATIONS

1. You should get yourselves aware of the potential danger of manual handling operations.

2. When doubt, you should seek advice from technical staffs.

3. You should not perform any dangerous manual handling operations.

4. You should refer to the Manual Handling Operations Risk Assessment results which can be obtained through Senior Technical Officers before performing the manual handling operations in the LAB.

5. Laboratory staffs will assist you the proper manual handling operations. However, you will be stopped from all improper manual handling operations immediately when it is found.

Regular Risk Assessment for staff

- All the Laboratories and Research Centers should carry out Manual Handling Operations Risk Assessment.

- All Manual Handling Operations Risk Assessment should be reviewed if the working conditions are changed or when new facilities are equipped. Laboratory staffs should inform Senior Technicians to review their assessment when this happen.

- All Manual Handling Operations Risk Assessment results will be centralized in a safety materials cabinet which is located at the Laboratory corridor and is open for public reference.

h. SAFETY TRAININGS AND BRIEFING FOR RESEARCH STAFF

It is a 3-stages process for every academic and research staff who want to conduct their work in the MNE Laboratories.

1. First Stage: FMO Safety Training

After employees join the department and receive an Electronic ID, they need to log in to Canvas (the learning management software system) to conduct the online safety trainings under the FMO Safety Training Course. The Canvas system is easily accessible through the QUICKLINKS menu on the CityU website. Some multiple-choice questions will be asked at the end of the training. Employees need to complete the safety training before they are allowed to go to the 2nd stage of the safety training.

2. Second Stage: MNE Safety orientation and briefing

The staff concerned needs to come down to the Lab office and staff will give them a face to face safety orientation and briefing talk which lasts for about 30 minutes. It will cover some introduction of in-house safety rules and guidelines and some CityU and Departmental safety videos will be given to them. Staff needs to go through all these materials clearly and to sign the declaration form in order to complete this orientation. For ease of administration, this safety orientation will be held regular about once in a week. New staff will be informed and invited to join the orientation.

After these first 2 stages, staff will be allowed to enter to the Laboratory. However, to conduct work inside individual Lab areas, they need to go through the 3rd stage of risk assessment.

3. Third Stage: Individual Risk Assessment

In order to work inside a particular lab area, staff needs to conduct a risk assessment (the form can be obtained in the Laboratory). The risk assessment should be conducted for each individual workplace. That is to say, if a staff needs to work in 2 different areas, they need to prepare two risk assessment forms. The form will be passed to appropriate technical staff and they will conduct the risk assessment with you and ask you to sign on the form.

Only after all these 3 stages are completed, the staff can then be allowed to work inside the LAB via a proper application (see A*ppendix V* for a sample application form). If you have any further query about this matter, please feel free to contact the Lab Office for details

E. Work in the Lab after normal office hours

(For undergraduate students)

1. Individual laboratories will be opened (usually from 7:00pm – 10:00pm) when there are scheduled laboratory experiment sessions in the evening. Final year project students can work in these laboratories when they are open. Students should stop their work and leave the laboratories when the students there finish their experiments.

2. For laboratories other than those described in condition 1 above, there will be no technicians on duty and the laboratories are closed. Students are not allowed to enter these laboratories.

Remark: -

When students are working independently in a laboratory under condition 1, minimal services and technical advice will be given by the technician on duty since the priority is given to the students doing the scheduled experiments there.

(For MNE research staff)

For safety reasons, it is the general practice that no access will be given to research staff to enter individual teaching laboratory area after **the Lab office hours when the teaching lab is closed**. In order to use a particular piece of teaching equipment in the lab individually, usually the research staff needs to complete a risk assessment application. Once it is done, the research staff is able to access the related teaching lab and to use the equipment until 11:00pm each day by filling the application form (see *Appendix V*) and obtain approval from the Lab Office. To grant access to individual laboratory, the **applicant must**:-

- **Fully fill in the application form and with their supervisor's approval,**
- **Successfully complete the Self Risk Assessment exercise, and with a copy of the assessment form attached,**
- **Fully aware of the Personal Alarm System (PAS), and how to use it when necessary in the lab,**
- **Leave the laboratory and campus before 11:00pm when CityU is officially closed.**

Once approved, the grant will normally be given to 8:00am - 11:00pm every day for MNE staff. For other department's staff, the working hours in individual laboratory will be restricted to the LAB Opening hours stated in *Appendix I.*

If research staff needs to stay at the individual laboratory area after 11:00pm and overnight in some very special occasion, they are required to fill an application form (see *Appendix VI* for the registration form) and send it to Chief Technical Officer for approval. To grant the access, the staff must have completed the risk assessment and is approved to work in this particular lab beforehand. In current practice, each application is ***limited to 4 weeks***. If they need to work overnight for more than 4 weeks, they need to submit a new application.

F. Use of Consumables in the Lab

1. Introduction

To support teaching, student projects and research work, small parts and recurrent items are always required. To differentiate these items with the major equipment purchase, which usually requires tighter and much complicate administrative control procedures, consumable budget account is used. To assist staff and students to better understand the operation of the consumable account, this manual outlines how consumable account and consumable stores are managed in the Department, and the procedures required for such purchase.

2. Definition of Consumable

The consumable account can only be used for consumable purchase. However, there is no precise definition of what is considered as consumable. In general principle, consumable are minor electrical, plastic, chemical and mechanical parts that are re-current in nature and their life time is usually short (less than 1 year) and/or the price for such parts are inexpensive (usually costs less than HK$1,000). Moreover, since City University has a separate budget account for stationery, consumable account cannot be used for stationery purchase, such as papers, photo-copy, stamp, file, books, etc. Users are advised to discuss with the LAB Office, for those items that are not clear whether it is classified as consumable, in advance of their purchase.

3. Purchase of consumables

a. Purchase Requisition (PR)

Each year, the Laboratory receives a lump sum budget from Department for the purchase of consumable to support the teaching and student projects work for the year. Purchase Requisition (PR) needs to be prepared to purchase expensive consumable items (usually when the total purchase per request is more than HK$5000) or those suppliers who do not accept petty cash purchase. Proper account code to be assigned and finally endorsed by the Chief Technical Officer. These PRs will be sent to the Finance Office electronically who in turn will issue formal Purchase Order (PO) to the suggested suppliers for us. When the items arrive, it will be delivered to the LAB Receiving Counter at 1/F, Lift No.4 and our student helpers will contact the user to collect it. The central coordinator, Mr. WC Li (x 34429393), is our senior technician to oversee the daily operation of the consumable store in the Department. He is also responsible for the creation and maintenance of computer user accounts that are needed for users to access the Consumable Control system (CCS).

b.) Petty cash purchase

Due to the vast diversity of the type of consumable that we require, it is not viable for our local store to keep an adequate level of all consumables. For urgent requirements, users can go out to local shops to purchase the items first, and then obtain reimbursement later. These petty cash purchase is limited to HK$1000 per single item to be purchased in one day. Users need to access the CCS (Consumable Control System) and print out a claim form and send it to Chief Technical Officer at the Lab. Office in B1664 for cash reimbursement. Besides, each petty cash claim form is limited to HK$5,000 also.

c.) Blanket order purchase

For some urgently required items, there is still another mechanism to speed up the purchase. City University has established purchase agreements with some of the major local consumable suppliers. We can raise a so-called "blanket order" and send it directly to these suppliers. These purchases need not go through the Finance Office for further processing and usually the suppliers are able to deliver the items to us directly within few days. In the current practice, all blanket orders are prepared by technicians on users' requests since they usually have a better understanding and relationship with the suppliers and know the details of each consumable better. For details of all currently available vendors for standing order purchase, students are advised to contact our Senior Technician Mr. WC Li (x 3442 9393) in the Lab office.

4. Consumable computer users account

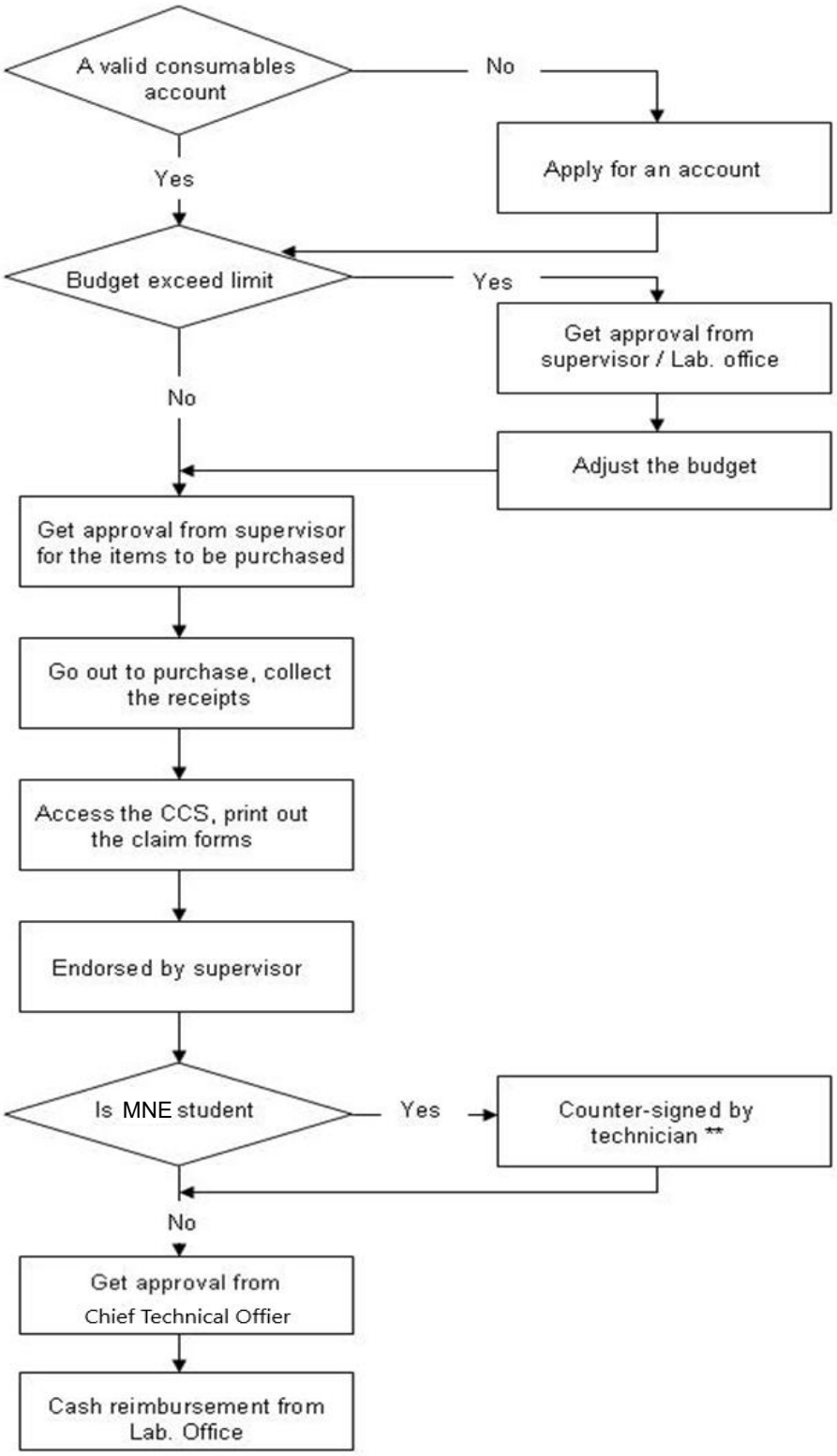
There is a web-based on-line Consumable Control System (MNE CCS) for users to raise petty cash and blanket order request and it records every purchase transaction including petty cash purchase and reimbursement. The MNE CCS can be accessed by accessing the website:

www.meem.cityu.edu.hk/webapps/index.asp

and click to select CCS application. The operation manual is also available there to assist users to use the MNE CCS. In order to collect items from local store, to obtain reimbursement for petty cash purchase, a computer user account is required for every user to access the MNE CCS. Students and RA/RS should apply for a user account, with some initial budget, at the beginning of each financial year (at around mid-July of each year) (See Appendix VII for a sample application form for user account which can be obtained from Lab. Office B1664 or from INTRAMEL (by accessing the website www.meem.cityu.edu.hk/webapps/index.asp and click to select the IntraMEL application)). The maximum budget for each category of students are confirmed and outlined in Appendix VIII. The consumable account is valid for one year only and will be closed at the end of Sem B each year. Therefore, all users are required to clear all their transactions and claim all petty cash reimbursement well in advance before the end of Sem B. All balances of each account will then be transferred back to Departmental central account automatically and immediately. For academic staff, since it is our intention and ongoing practice that technicians will assist them to take care of all necessary document work, we would not create account for them. Instead, they can simply direct all their requests to the technicians directly.

5. Procedures for purchase and reimbursement

a) Petty cash purchase



b) Purchase by academic staff

For academic staff, we do not have such a complex procedure as for students. In normal practice, when staffs foresee a need for a bulk quantity of consumable to either run a laboratory exercise, they can either talk to the relevant laboratory group leaders and/or Chief Technical Officer directly. Eventually, technicians will check the existing stock level, and base on the estimated purchase lead-time and the urgency of the items, they will either raise a bulk consumable request or a standing order purchase to the LAB office.

However, it is not recommended for academic staff to purchase items for their project students. Instead, all students should have their own accounts. In this way, we can have a better and more precise record and analysis of the usage of the consumable budget by each category of users.

c) Support for Research work

Due to the limited budget available, and the fact that consumable budget is allocated on the basis of the numbers of student intake, we have to stop the support of consumable for RAs and RSs. Therefore, principle investigators are strongly advised to plan for enough consumable budgets in their research proposals, and they shall purchase and receive their consumable on their own. If the research group wants to make use of the Department consumable control system to purchase and administrate consumable for their work, they can transfer enough funding from their research account to the Department consumable account. In this way, we shall create a consumable account for them so that they can purchase consumables via our system. Appendix IX shows the budget transfer form for this use.

6. Conclusion

This operation manual outlines only the basic management and operation of the consumable budget in our Department. Some detailed mechanisms are skipped for simplicity. In fact, the system itself is quite flexible and there are rooms for us to maneuver. Therefore, users are strongly recommended to discuss with the technicians and/or Lab. Office for any further details.

G. Basic Support for Final Year Project (FYP) Work

For FYP students, please read this note carefully which provides some useful information regarding the FYP work in MNE Laboratory.

- Consumables account and purchase
    - Do check with your project supervisor if you require some budget to purchase consumables for your FYP. If so, you need to submit the application form (Appendix VII) to Lab Office before end of December to create a consumable account for you. After this deadline, no consumable account will be created for you, and you are not allowed to purchase any consumables before an account is created for you and have enough budget to cover the expense.
    - Freight charge for goods purchased oversee or in Mainland China. There is a stringent requirement in CityU that we have to use the least available freight charge for shipment. As such, do check with the Lab Office before confirm the order. You may not be reimbursed the full freight charge if it is found too expensive.
    - **It is important to remind NOT TO RAISE ORDER with the vendor directly and ask MNE to settle the bill. There is a lot of financial practice and procedures to govern this. If you deem need to raise order instead of petty cash purchase, please consult the Lab Office for proper procedures.**

- Chemicals and Biological substances
    - A lot of chemicals are dangerous substances and they are regulated by different laws and internal rules. There are also straight rules in purchasing and bringing chemicals to the Lab. See *Appendix IV* for the application form. It is strongly advised that you do not purchase chemicals on your own. Do consult our Lab Chemical coordinator before you do need to purchase.
    - Many Chemicals and Biological substances have potential hazards, you must study carefully the MSDS (Materials Safety Data Sheet) of the substances you are going to use and to consult the technical staff or your project supervisor if adequate safety precautions are in place before you conduct the experiments.

- Dress code and Personal Protective Equipment (PPE)
    - Never wear shorts, skirt, slippers, open toes shoes into the Lab
    - For different operations, you have to wear proper PPE to protect your work. In particular, to deal with chemicals and biological substances, you have to wear lab coats, glove and sometimes glasses to protect yourself during the work. Do ask the technical staff and or research staff who is supervising your work before the operation.

- Supervision and work
    - CityU has a straight regulation that undergraduate students need to be accompanied by a qualified staff whenever they are working in the laboratory.
    - Therefore, you are not allowed and should not work alone in the lab without supervision by a qualified staff.
    - You are either working in a teaching lab or a dedicated research lab. Check the Department home page (under Laboratory section for the list of lab). When you are working in a teaching lab, there will usually be a technician taking care of your work and you can ask him for technical support related to the equipment in that lab area and other safety matters.

- When you are working in a research lab, usually your project supervisor will assign one of the research assistant or PhD student as a qualified staff to take care of your work. In this case, a registration form will be filed (*see Appendix X*) which state clearly who is the qualified staff assigned to look after you. Please check with your supervisor for this form before you work in the research lab.
- Do remember NOT to operate the equipment on your own and /or in doubt of the potential hazard of the operation. Ask the qualified staff to help.

- Online booking of major equipment
  - There may be chance for you to make use of some major equipment which is available for online booking. As FYP students, the equipment charges will deduct from your FYP project account.
  - However, as a regular practice, we do require you to learn how to operate the equipment yourself and to book the equipment in advance using the online booking system. In this case, please use the attached registration form to apply for an account (*see Appendix XI*).

- In-house safety rules and regulations
  - To maintain the Lab a safe workplace and to make sure all users work safely in the Laboratory, a numbers of safety rules and guidelines are developed specified for MNE. It includes but not limit to Chemicals safety, Chemicals wastes handling, biological substances and wastes handling, Laser safety guidelines, guidelines for animals work, cell culturing safety, etc. As such, you are strongly requested to take a careful read of these rules and guidelines before you commence your FYP work.
  - All these rules and guidelines and the associated forms can be obtained in MNE home page at www.cityu.edu.hk/mne/ (under the Laboratories section).

- Useful Contacts
  - Department home page: www.cityu.edu.hk/mne
  - Chemical Control coordinator Mr. WP Lau (3442 7010, email:mebill@cityu.edu.hk)
  - Consumables support: Mr. WC Li (3442 9393, email:mejim.li@cityu.edu.hk)
  - Safety coordinator Mr. KC Kian (3442 8938, email:mekian@cityu.edu.hk)
  - Laser Safety coordinator Mr. YIU Kelvin (3442 8026, email:mecyyiu@cityu.edu.hk)

H. Policy on Laboratory Classes

Laboratory classes are an important part of university engineering education, from which you can learn hands-on experience in specific engineering fields. However, there is more to learn than just engineering knowledge when you attend the hard engineering oriented classes.

Attendance

The knowledge learnt in the lab classes cannot be easily obtained through lectures and private study. Therefore, attending lab classes is critical to achieve a holistic engineering education. The laboratory classes are pre-scheduled and they contribute to the formal assessment of the coursework. Absence without legit support (such as sick leave certificate issued by a Hong Kong registered doctor) implies nil achievement of that part of coursework.

Punctuality

Punctuality is an established professional practice observed in the engineering community. In the real competitive world, professionals often arrive earlier than the official time such that they are better prepared for the work.

As an upcoming engineer, students should arrive no later than 15 minutes from the officially announced or timetabled commencement time of the laboratory session. Attendance register will be closed 15 minutes after the start time of the lab session, and the attendance sheet will be collected by lab tutor for further processing. Students missing the cut-off time are considered as absent from class and make-up lab class WILL NOT be provided. However, late students are encouraged to stay on to participate in the laboratory exercise for the sake of learning.

Safety

As people often say, the world is a dangerous place, and it is even truer inside any laboratories. Most of the time, we are the best person to ensure our own personal safety.

As far as the MNE laboratory is concerned, the Department has imposed the proper dress code for entering and working within the laboratory premises.

1. People SHOULD NOT wear shorts, skirt, sandal and slipper (or any open-toed shoes) when entering and/or working inside MNE Laboratory.
2. All technical staff, sometimes with the assistance of security guards, will check carefully all the people entering the Lab for proper dressing. Anyone violating this rule will be ASKED TO LEAVE THE LABORATORY IMMEDIATELY WITHOUT FURTHER NOTICES.

In addition, eating and drinking are prohibited in MNE laboratories to avoid any contamination by chemicals and dirt. Bags and bulky items should be placed in the nearby lockers to avoid any unnecessary accidents. Each laboratory has its own safety requirements, and students are required to pay attention to laboratory staff's safety briefings, usually at the beginning of the lab session. Anyone violating the laboratory's safety requirements or staff's safety instructions will be ASKED TO LEAVE THE LABORATORY IMMEDIATELY WITHOUT FURTHER NOTICES. As MNE has many machines in its various laboratories, students are strongly advised not to wear any jewelry or loose items that may be easily caught by the mechanical moving parts of machines during the lab session.

Appendix I

The LAB Opening Hours

During Semester A and B

Mon. - Fri.	9:00am – 12:30pm (closed for lunch 12:30pm - 1:30pm)
	1:30pm – 5:15pm
For scheduled evening work	7:00pm- 10:00pm *

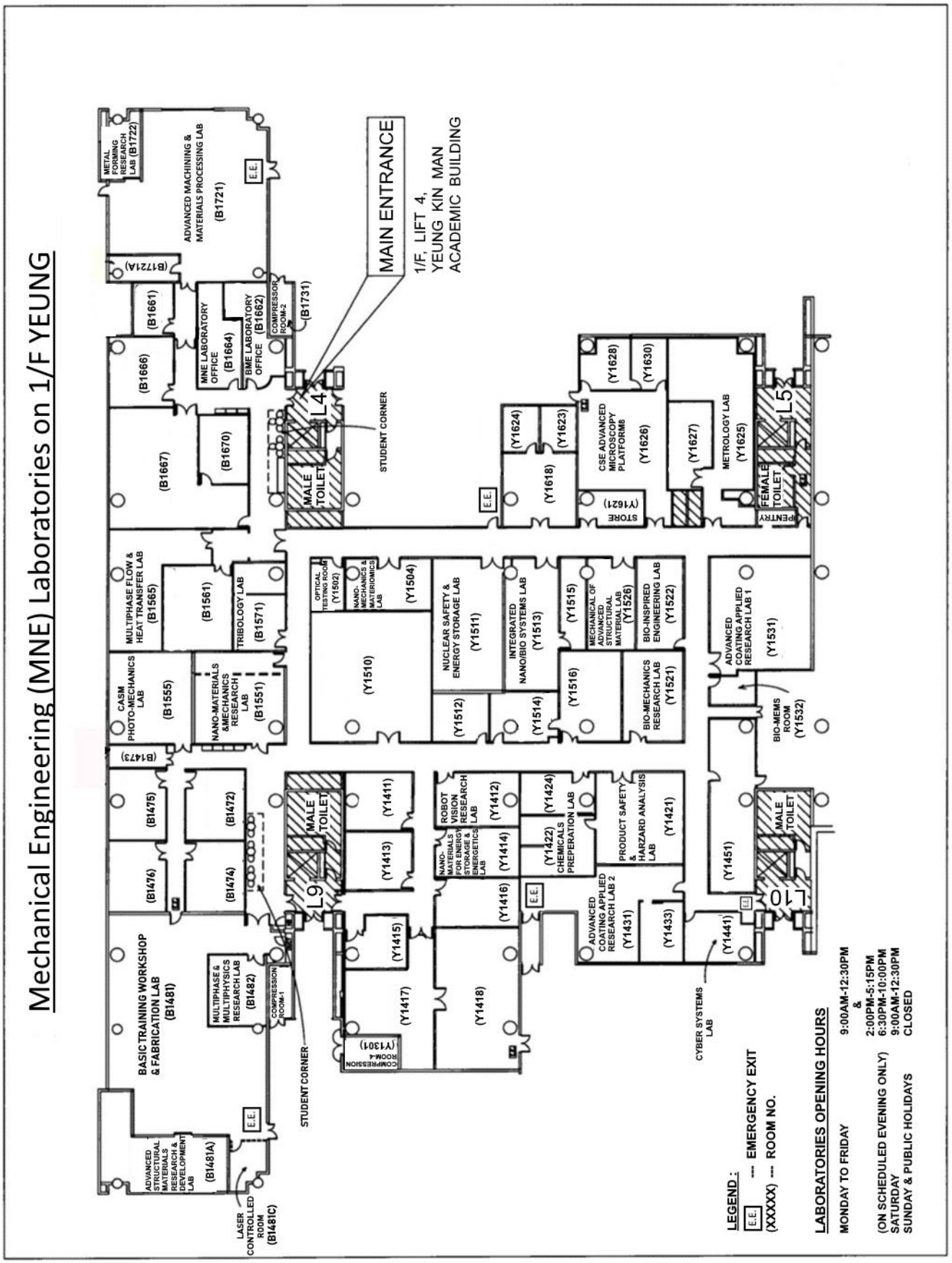
**The LAB will be open in evening only when there are experiments or other scheduled activities.*

Sat.	9:00am - 12:30pm
Sunday and Public holiday	closed

During Semester Break, Summer Term

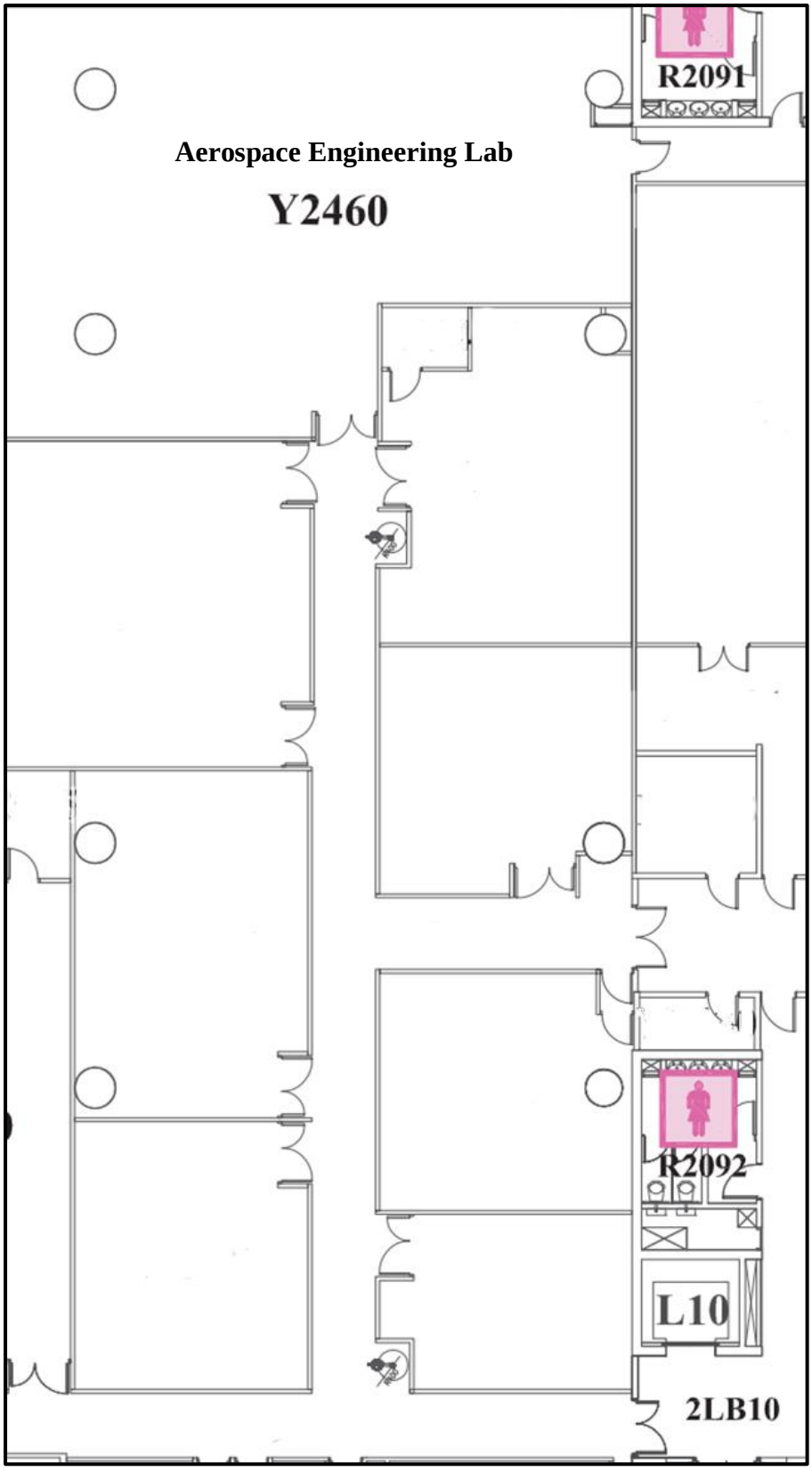
Mon. - Fri.	9:00am – 12:30pm (closed for lunch 12:30pm - 1:30pm)
	1:30pm – 5:15pm
Sat.	9:00am – 12:30pm
Sunday and Public holiday	closed

Appendix II-a

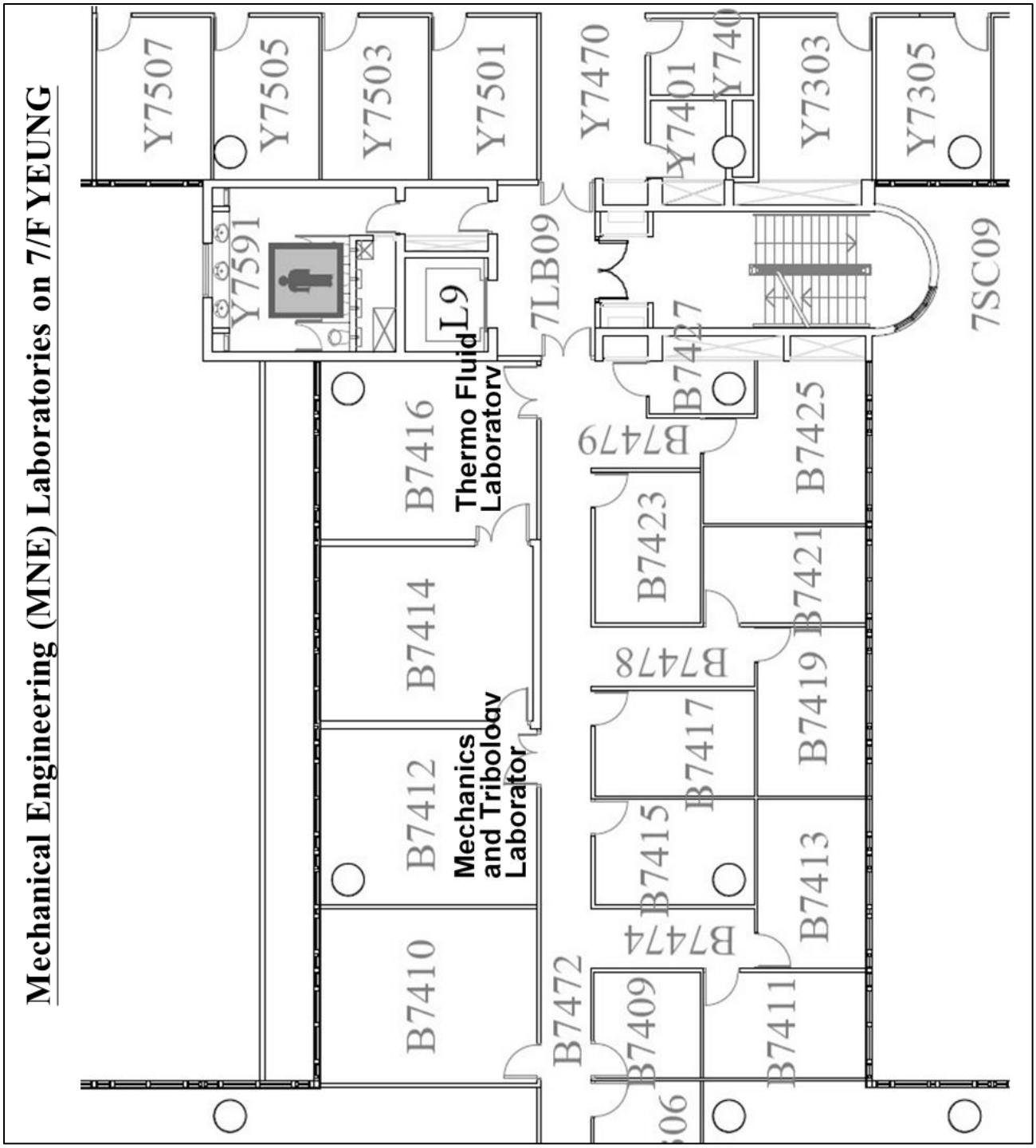


Appendix II-b

Mechanical Engineering (MNE) Laboratories on 2/F YEUNG

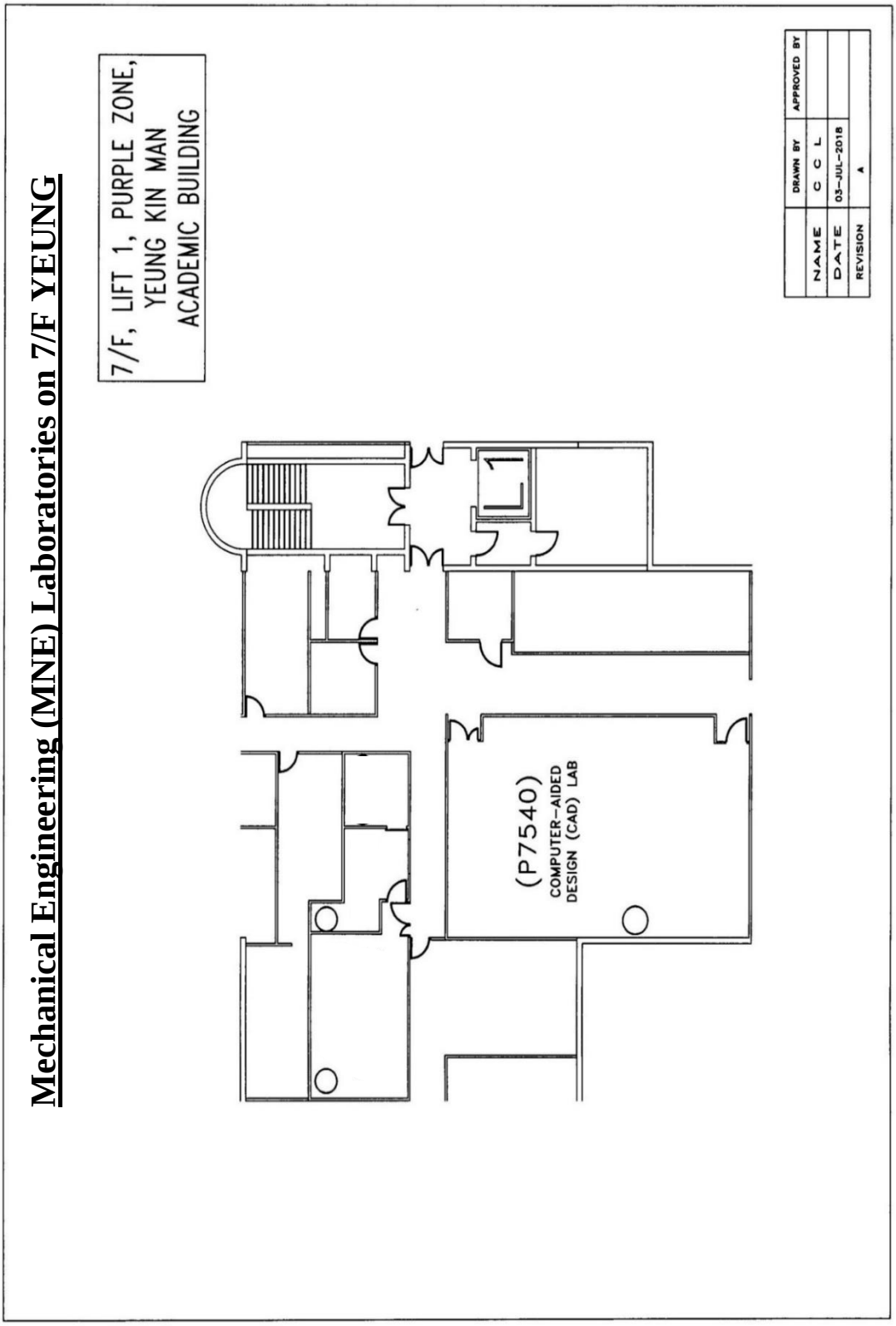


Appendix II-c



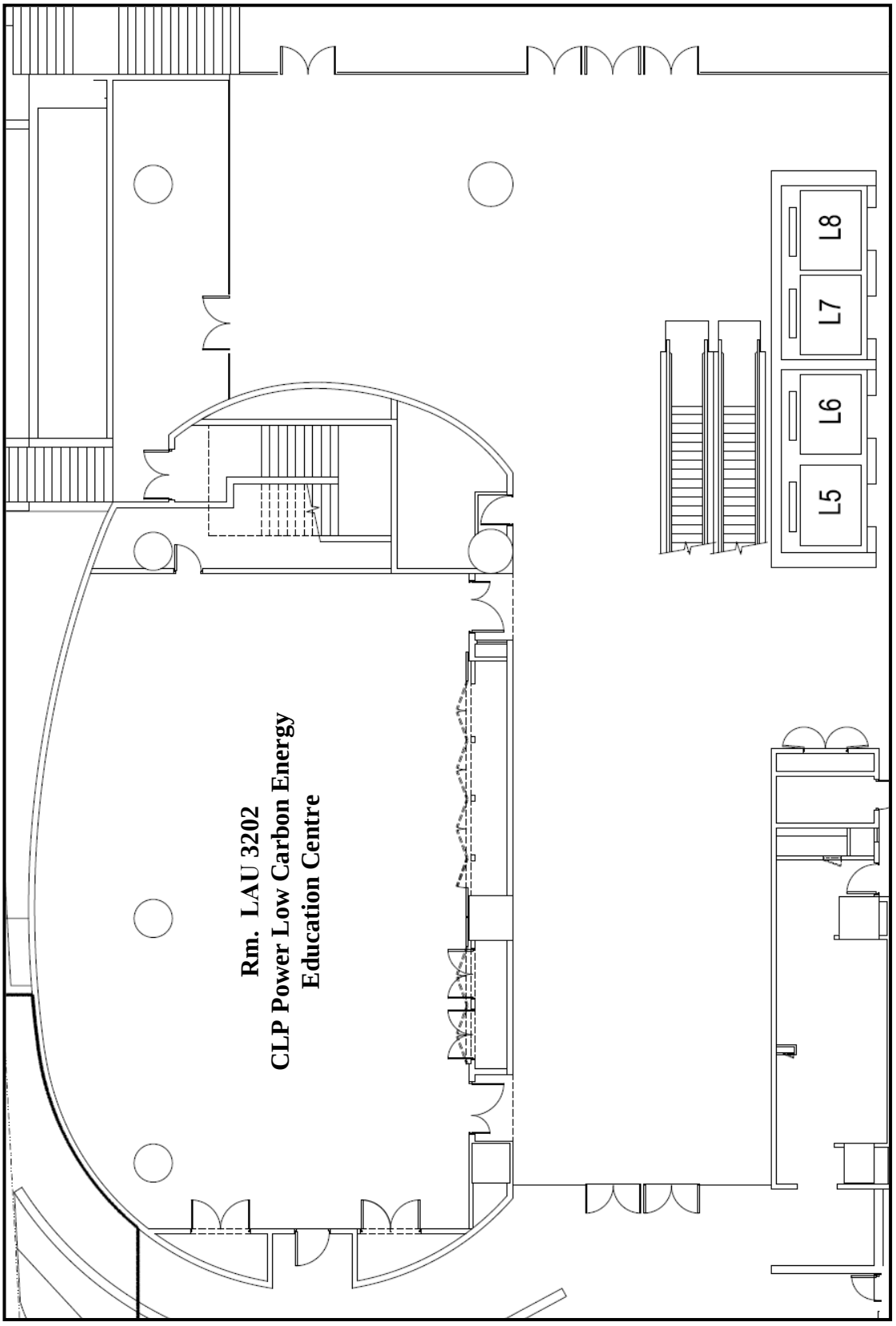
Appendix II-d

Mechanical Engineering (MNE) Laboratories on 7/F YEUNG



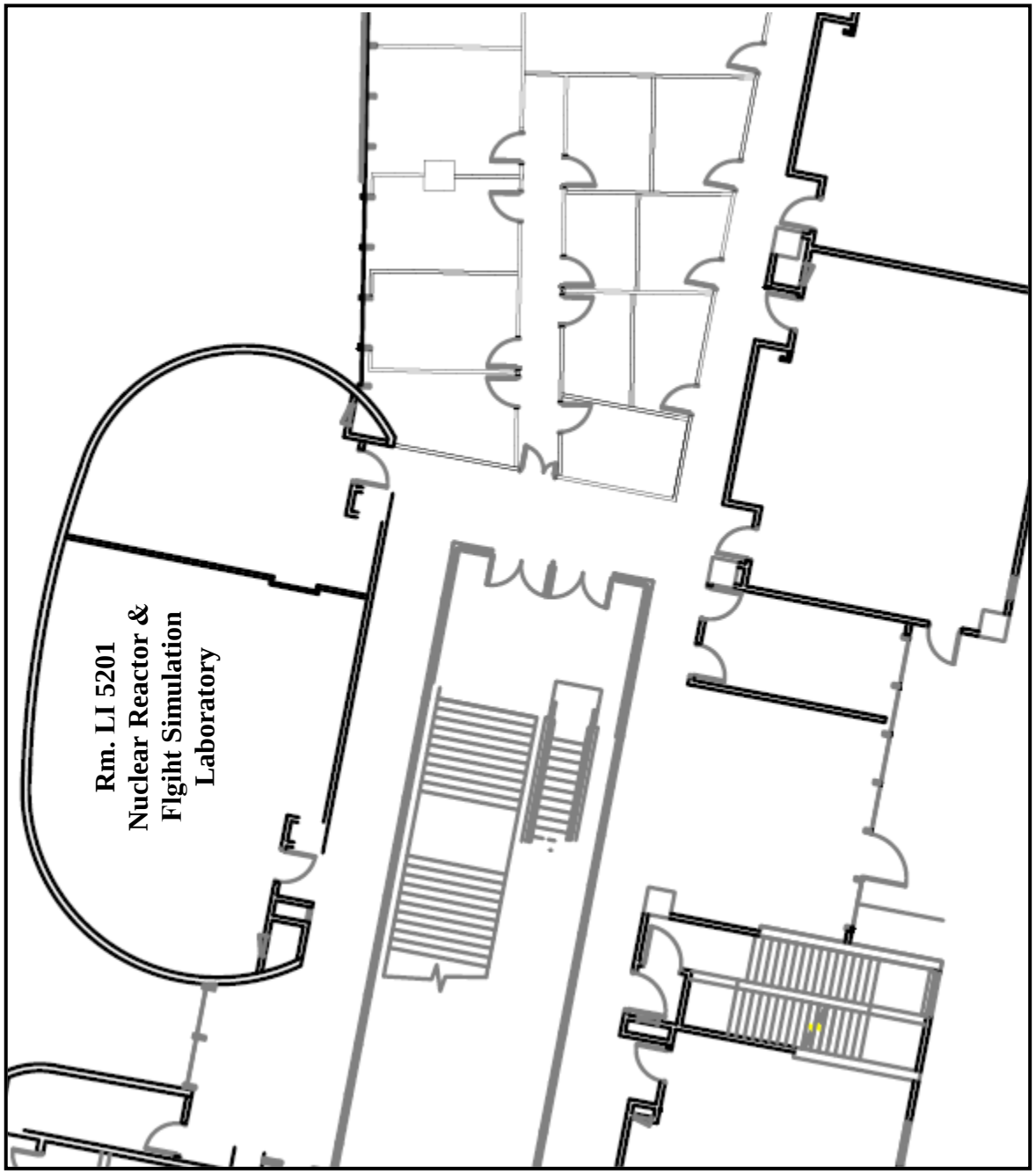
Appendix II-e

Mechanical Engineering (MNE) Laboratories on 3/F LAU



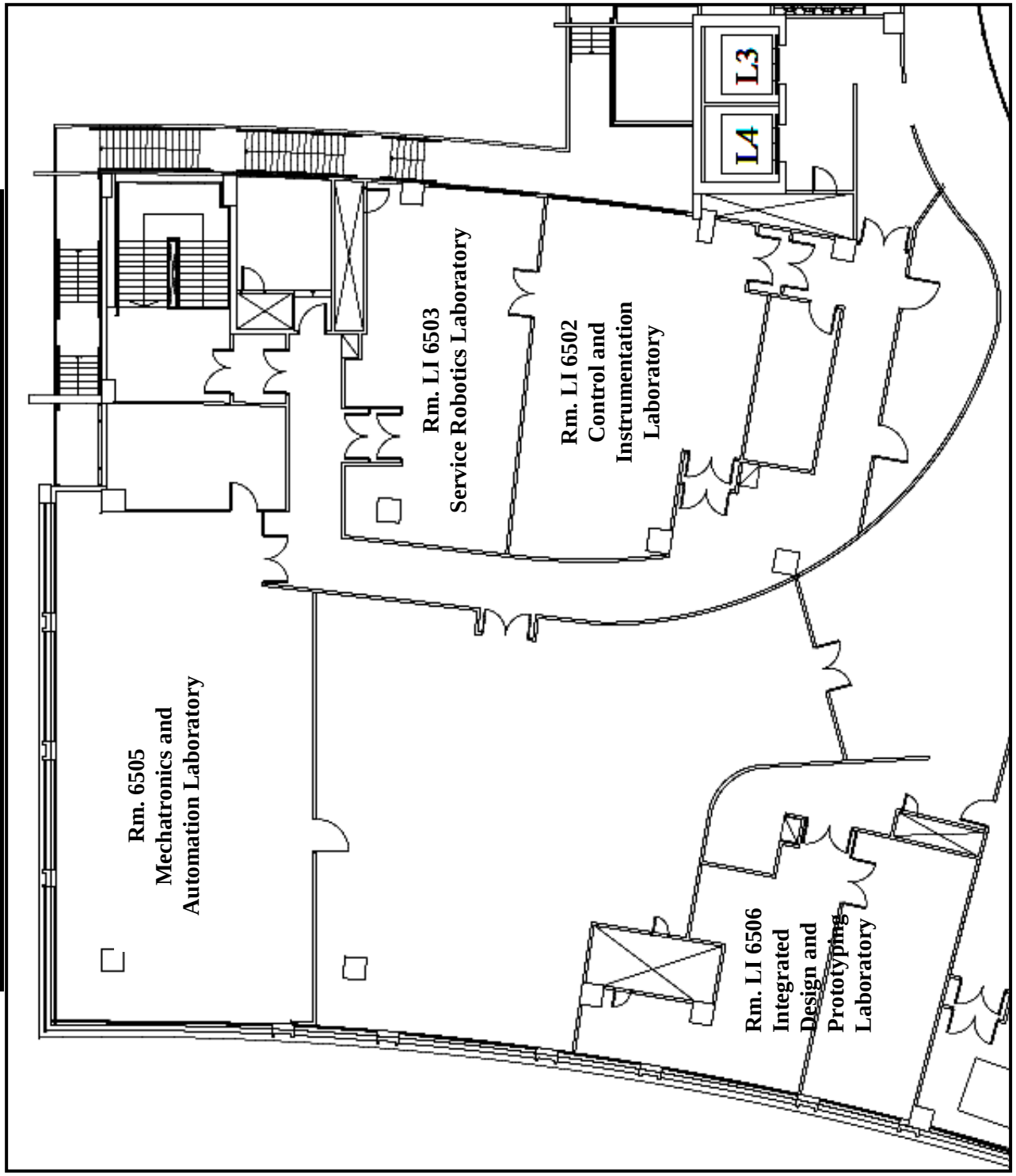
Appendix II-f

Mechanical Engineering (MNE) Laboratories on 5/F LAU



Appendix II-q

Mechanical Engineering (MNE) Laboratories on 6/F LI



Appendix III

Department of MNE
Internal Guidelines and Procedures for Chemical Waste Disposal

The guidelines and procedures can be implemented in a 3-stage process as described below, and different users need to play different roles in order to ensure the safe use, and handling of chemicals and their waste in the Department.

Frist Stage:
At the time a research project (or FYP) is initiated or proposed
According to the requirements from Research Office, all Principle Investigators (PIs) need to complete a form when a research project is intended to use, modify, process or store any dangerous chemicals at the University. In this "Statement of the Use of Dangerous Chemicals" form which can be downloaded from RO website, PIs are required to name all the dangerous chemicals that will be used in the research and IDENTIFY disposal methods for the chemical wastes. The form will be sent to the CityU Chemical Safety Officer (Dr. Vincent Ko of BCH at the moment) for this examination, comments and endorsement. Attachment a is the form to declare the use of chemicals, or you can download the form from RO homepage at http://www.cityu.edu.hk/ro/studentlan/dlSafety.htm.

Second Stage
Risk assessment and formation of waste disposal methods
All lecturers and Principal Investigators are responsible for IDENTIFYING THE QUANTITY, NATURE AND DISPOSAL METHOD FOR CHEMICAL WASTE. As such, a proper risk assessment must be prepared for every FYP work and/or research work dealing with chemicals, in which the quantity of chemicals and chemicals wastes must be identified. Once the Lab Office receives such risk assessment, the technical staff will assist the lecturers and/or PIs to develop clear disposal procedures for the wastes which will be generated from this project. Lecturers and PIs are requested to read carefully the Chemical Waste Disposal System of CityU (see Attachment b, or it can be downloaded at FMO homepage at www.cityu.edu.hk/fmo under Safety, Health and Environment ->Safety and Health Information) for the compatibility of different chemicals. If it is found that the chemical wastes generated are not compatible with the existing waste buckets in the Department, Central Safety Unit has to be consulted for proper treatment methods before the research or FYP activities can be started.

Third Stage
Chemical waste disposal training /briefing to individual users
After the disposal procedure is confirmed, every user need to go through a training session for the proper disposal of chemicals waste that they are going to create, before they are allowed to start their work. The following points must be noted:

- All users must be fully aware of the quantity and the nature of chemical wastes they are creating.
- Proper protective equipment including goggle, lab coat and glove must be worn when users are dealing with chemicals and chemical wastes. They should keep incompatible wastes into separate waste buckets provided. Before they pour the waste to the bucket, they should check with the log sheet associated with each waste bucket and to make sure that there is no incompatible wastes in the bucket. If in doubt, they should not pour the wastes to the bucket but to contact the technical staff for further assistance. FOR FIRST TIME GENERATION OF A NEW WASTE, A COMPATIBILITY TEST MUST BE CONDUCTED BEFORE IT IS ALLOWED TO BE

POURED INTO THE DESIGNATED WASTE BUCKET.

- After they poured the wastes to the buckets, they should fill in the log sheet the quantity and substances of the wastes as well.
- Since there is no Neutralization Tank installed in our Department's draining system, we are **not allowed** to pour any chemical wastes directly into the sink.
- For concentrated acid waste, the user should dilute it as soon as possible and pour it into the correct waste bucket. The user should avoid storing concentrated acid wastes in the Lab nor inside the fume cupboard.
- To dilute concentrated acid waste, the user should dilute it at least below 5% by weight before pouring it into the waste buckets. To prevent excessive heat generation during the dilution process, the user should put enough ice into a big enough container of water, and keep the water moving by using a magnetic stirrer, and then pour the concentrated acid into the water SLOWLY and in SMALL quantities.
- New Waste Compatibility Test procedures:
    1. The test should be done in a fume cupboard.
    2. Draw 50ml sample from target waste buckets into a beaker
    3. Insert a thermometer into the beaker.
    4. Slowly mix a portion of new chemical waste. The volumetric ratio of the waste should be similar to that between the original container content and the new wastes.
    5. If bubbling, fuming, or temperature rise (10C or more) is observed within 5 minutes from the start of the mixing, stop the process. The chemical waste is considered not compatible with the waste bucket. A new waste bucket needs to be used instead.

Attachment a **STATEMENT OF THE USE OF DANGEROUS CHEMICALS**

Title of Proposal :

Name of PI (Dept) :

This form must be completed where it is intended to use, modify, process or store any dangerous chemicals in any research related activities. In order to comply with relevant Hong Kong Ordinances, Labour Department Guidance and the CityU Safety Committee instructions, you are required to name all the dangerous chemicals that will be used in this research and identify disposal method(s) for the chemical waste. The Chemical Safety Officer will examine your list and proposed methods to be applied to this research.

This form should be completed and submitted together with the proposal.

Please supply the following details for each dangerous chemical :

Material safety data sheet
Maximun quantity used per experiment
Maximum quantity in storage
Chemical waste Streams ***(Note: Please read Chemical Waste Disposal System of CityU on CDFO's homepage : http://www6.cityu.edu.hk/cdfo/download/chemicalwastedisposal.pdf***

Total number of dangerous chemicals to be used
Relevant guidance passed to PI.

Signed :
DrVincent C C Ko
(Chemical Safety Officer)
Date :

Declaration

I confirm that I have supplied a complete list of all dangerous chemicals and their manner of use and disposal in this project. I have read the relevant safety and chemical waste disposal information and confirm that I understand its application to this project.

Signed :
(Principal Investigator)

Date :

Attachment b

City University of Hong Kong
Chemical Waste Disposal System

The main strategy for compliance relies upon a knowledge of the waste type and quantity that we are producing and putting it into the correct pail or diluting (for very small quantity of weak acid and alkali waste only) and flushing it down the sink in Phase 2 (Purple Zone, MMW Building and Sports Complex) only. In Phase 1 (Green, Blue, Yellow Zones, AM, CYC, FYW Buildings), all wastes must be collected in pails, stored and delivered to the chemical waste disposer, Ecospace Ltd. The detailed duties for this system follow.

Each department has one or more persons appointed as Chemical Waste Person In-charge (CWI) who can advise you on departmental methods (list of names attached – Appendix B). Every lecturer who makes out a laboratory sheet and every researcher needs to identify the nature and quantity of chemical waste that this work is producing and a suitable disposal method.

The System

The master table in Appendix A, Schedule of Substances and Chemicals under control of EPD's publication "A Guide to the Chemical Waste Control Scheme" determines the disposal method. There must be a separate pail or container for every item listed in Part A. These will be provided on request from the CWI on an one off basis.

The mineral oils and toxic salts in aqueous solution pails will take care of Part B substances and the acids, alkalis and corrosive compounds will go into the sinks (Phase 2 only) after suitable dilution has been specified by the lecturer.

New substances being synthesized etc. will need to be assessed for hazard and risk before a disposal method is determined. In the absence of a risk assessment it will always be assumed that the substance requires a separate pail.

Suggested Waste Streams (other than sinks)

Each of the following groups of material should be held in separated containers:

- Non-halo-solvent
- Halo-solvent
- Acid
- Lub Oil
- Nitric Acid
- Fluoroboric Acid
- Etchant
- Alkali, Fixer & Developer
- Iron(iii) Chloride, Etchant
- Alkali, Sodium Hydroxide
- Alkaline with Metal
- Acid Organic, Etchant
- Cutting Fluid
- Pesticide in Hexane
- Non-halo-acrylic
- Bromine Solution
- Solid Material with Mercury
- Lean Organic
- Ammonia Solution

N.B. Acetic and Formic acids are organic acids. It is suggested after consultation with Ecospace that there is no reason why these two acids with concentration less than 10% by weight cannot go down to the neutralization plant through the sinks.

In addition, for Phase 1 there will be an additional pail for inorganic acids.

Summary of Responsibilities

I. Lecturers and Principal Investigators are responsible for:

- Identifying the quantity, nature and disposal method for chemical waste
- Ensuring chemical containers bottles are adequately rinsed before disposal

II. Users (every person who produces chemical wastes) are responsible for:

- Following the methods prescribed for waste disposal in I above, i.e. correct pail / container or dilution
- Transporting waste from the laboratory to the waste storage area
- Failure to follow the correct waste disposal procedure will result in a verbal warning, repeated lapses will eventually lead to dismissal from laboratory work
- Any person breaching the Ordinance will be personally responsible for any fine following a successful prosecution
- Not disposing chemical containers / bottles which are not adequately rinsed for safe disposal

III. Chemical Waste Person In-charge (CWIs) (Appendix B) are responsible for:

- Requesting the correct pails or containers from CDFO
- Testing the incompatibility of the waste in the pail
- Temporarily storing the waste within the laboratory
- Rinsing empty chemical containers / bottles to render them safe for disposal as a general waste

IV. The Facilities Manager (Safety & Ambiance) is responsible for:

- Providing guidance on the overall management of chemical waste, including new chemical waste (for application of disposal, please see Appendix C)
- Evaluating the operation for regulatory compliance
- Securing chemical waste disposal permits
- Co-ordinating chemical waste disposal in SCM, SDS, UP & CDFO
- Providing waste containers, labels and other accessories which are supplied from CWTC
- Managing the waste storage areas for SCM, SDS, UP & CDFO
- Preparing waste for transportation to the disposal site including the log sheet for SCM, SDS, UP & CDFO
- Providing temporary chemical waste (liquid and regular items) disposal service for CSE departments

Remarks:

CWI	-	Chemical Waste Person In-charge
CWTC	-	Chemical Waste Treatment Centre
EPD	-	Environmental Protection Department
CDFO	-	Campus Development and Facilities Office
CSE	-	College of Science and Engineering
UP	-	City University of HK Press
SDS	-	Student Development Services
SCM	-	School of Creative Media

SCHEDULE OF SUBSTANCES AND CHEMICALS

Part A

	Code
Any substance to which the Antibiotics Ordinance (Cap. 137) applies	30
Asbestos	09
Dangerous drugs (as defined in the Dangerous Drugs Ordinance (Cap. 134))	10
Dangerous goods, category 2, NES .. (As defined in the Dangerous Goods Ordinance (Cap. 295))	02
Dangerous goods, category 6, NES ..	04
Dangerous goods, category 9, NES ..	14
Dibenzofurans	19
Dioxins	19
Pesticides (as defined in the Register referred to in Section 4(b) of the Pesticides Ordinance (Cap. 133))	06
Poisons (Part I) (as defined in the Pharmacy and Poisons Ordinance (Cap. 138))	20
Polychlorinated biphenyls	29

Part B

	Code
Antimony and its compounds	66
Arsenic compounds	66
Barium compounds	66
Beryllium and its compounds	66
Boron compounds	66
Cadmium and its compounds	66
Chromium bearing solid tannery waste	56
Chromium and its compounds, NES	66
Cobalt and its compounds	66
Copper compounds/copper etchant	66/76
Cyanides	96
Dangerous goods, category 3, NES .. (As defined in the Dangerous Goods Ordinance (Cap. 295))	38
Dangerous goods, category 4, NES ..	36
Dangerous goods, category 5, NES ..	33
Dangerous goods, category 7, NES ..	35
Dangerous goods, category 8, NES ..	34
Dangerous goods, category 10, NES	39
Halogenated organic solvents and compounds	49
Lead and its compounds	66
Manganese and its compounds	66
Mercury and its compounds	66
Mineral oils employed for engine lubrication	73
Mineral oils, NES	63
Nickel and its compounds	66
Non-halogenated organic solvents and compounds	43
Organo lead compounds	86
Organo mercury compounds	86
Organo tin compounds	86
Paints	53
Pesticides (as defined in the Register referred to in Section 4(a) of the Pesticides Ordinance (Cap. 133))	46
Pharmaceutical products and medicines, NES	40
Phosphorus compounds excluding phosphates	68
Selenium compounds	66
Silver compounds	66
Sulphides	98
Thallium and its compounds	66
Tin compounds	66
Vanadium compounds	66
Zinc compounds	66

Acids, alkalis and corrosive compounds

	Code
Acetic acid above 10% acetic acid by weight	48
Acids or acidic solutions, NES with acidity equivalent to above 5% nitric acid by weight	48
Ammonia solution above 10% ammonia by weight	58
Bases or alkaline solutions, NES, with alkalinity equivalent to above 1% sodium hydroxide by weight	58
Chromic acid above 1% chromic acid by weight	78
Fluoroboric acid above 5% fluoroboric acid by weight	48
Formic acid above 10% formic acid by weight	48
Hydrochloric acid above 5% hydrochloric acid by weight	48
Hydrofluoric acid above 0.1% hydrofluoric acid by weight	48
Hydrogen peroxide solution above 8% hydrogen peroxide by weight	55
Nitric acid above 5% nitric acid by weight	48
Perchloric acid above 5% perchloric acid by weight	48
Phosphoric acid above 5% phosphoric acid by weight	48
Potassium hydroxide solution above 1% potassium hydroxide by weight	58
Potassium hypochlorite solution above 5% active chlorine	88
Sodum hydroxide solution above 1% sodium hydroxide by weight	58
Sodium hypochlorite solution above 5% active chlorine	88
Sulphuric acid above 5% sulphuric acid by weight	48

NES = Not elsewhere specified

Appendix IV

Department of MNE
Chemical Request / Registration Form

Under the new DG Ordinance, all chemicals bring in or purchase to the Lab must be properly registered and controlled. A 2 stages process is developed here. As such, at stage 1, all users are requested to fill in this request form and obtain the approval before going to purchase and bring in any chemicals. At stage 2 after you purchased and collected the chemicals, you should approach the chemical coordinator for proper registration before bringing them to the LAB for use. In doubt, please contact our chemical coordinator Mr. WP Lau at 3442 7010, or email *mebill@cityu.edu.hk*.

Stage 1: Request before Purchase

Chemical / Common Name :_____

Chemical Formula :_____

CAS / MSDS No. (Mandatory) :_____

Manufacturers / Suppliers :_____

Classification :_____
(e.g. flammable / Corrosive / Toxic…)

Usage Purpose / Lab Area :_____ Qty Required :_____

User Name / Post :_____

Contact No. / Email :_____

Supervisor Signature :_____

Endorsed by
Chemical Coordinator :_____ Date :_____

The Lab Office Use

Approved by the
Chief Technical Officer :_____ Date :_____

Stage 2: Registration before bring in to LAB

Registration

Received by :_____ Registered by :_____
Qty Received :_____ Date :_____
Area to Store / Use :_____

By Chemicals, it is referred to all those whose MSDS can be found in the Sigma-Aldrich Material Safety Data Sheets which can be accessed via CityU "Work Desk" webpage.

Appendix V

Department of MNE
City University of Hong Kong

Application form for gain e-access to individual laboratory area
(Only valid for Research Staff / PhD Student of MNE)

Name: _____ CityU HKID: _____

Position : _____

Area to access : (Room Name):_____
(Room Number):_____

Specify Nature of the work :
_____
_____
_____

Applicant Signature : _____ Date : _____

Endorsed by : _____ Signature:_____
(Name of Supervisor)

Approved by : _____ Date : _____
(Chief Technical Officer)

Notes : For safety reasons and administration concern, non MNE research staff and PhD students will not be granted e-access to MNE Lab areas. They can only work during MNE Lab officer hours when there is technical staff around and on duty. This form is thus for those research staff/PhD students of MNE only. To grant access to individual laboratory, **applicant must:-**

- **Fully fill this application form and with your supervisor's approval,**
- **Successfully complete the Self Risk Assessment exercise, and with a copy of the assessment form attached,**
- **Fully aware of the Personal Alarm System (PAS) , and how to use it when needed in the lab,**
- **Leave the laboratory and CityUHK after 11:00pm when CityU is officially closed,**
- **Notify the security office at Ext.8888 every time when works outside normal lab office hours.**

Once approved, the grant will be given to 8:00 am – 11:00 pm everyday. If research staff needs to stay at the individual laboratory area after 11:00 pm in some very special occasion, they are required to apply using a separated application form and submit to Chief Technical Officer for approval in advance.

On signing this form, the applicant and the supervisor(s) admit that, to their best knowledge, the work done by the applicant in the area with the named equipment **WOULD NOT** create hazard to the applicant and other users in the laboratory. And they will continuously do their best to maintain the safety standard of the working area. The applicant will be held responsible for any damage to the named equipment or other equipment in the laboratory area due to the negligence or carelessness of the applicant. The applicant will be cancelled the grant once he/she is found violating any of the above requirements.

***The Lab Office hours : 9:00am – 5:15pm (Mon. - Fri.), 6:30pm – 10:00 pm (for occasion with scheduled evening classes only) 9:00am – 12:30pm (Sat.)**

Appendix VI

Department of MNE

Notification of the Requirement to Stay Overnight on Campus

To : Campus Management Unit (CMU) of CDFO (email : fmcms@cityu.edu.hk and waislai@cityu.edu.hk)

Name of Applicants	Staff / Student Number	Title (e.g. RA, RS etc.)	Contact Telephone Number	Work Venue or Room No.	Date or Period of Staying	Intended Leaving Time

**Duration for each application is limited to 4 weeks. Staff shall at all time bring this approved form with them when they are working overnight in BME lab and to prepare to show it to the patrolling guard when requested. Overnight is defined for any stay and work in BME lab after and beyond 12:00am each day.*

This is to re-acknowledge that the staff is fully aware of the location of PAS system in the lab area where they are applying for work overnight and fully understand how to use it in case of emergency.

(Please return this form to the Lab Office at AC1/B1662 for further process and record)

Signature by applying staff : _____
(Full name in capital letter)

Endorsed by :

_____ **(Signature)** _____ _____
Supervisor/Principal Investigator (Name :) **Department** **Date**

Approved by :

_____ **(Signature)** _____ _____
HoD or his/her delegate (Name:) **Department** **Date**

Appendix VII

Department of MNE
Consumable Account Application Form

(For FYP Student only)

Student Name	**CityU EID* (mandatory)**	Student ID
(Leader) : _____	_____	_____
(Member) : _____	_____	_____
(Member) : _____	_____	_____
(Member) : _____	_____	_____
(Member) : _____	_____	_____

Contact Phone No (Leader): _____

Program: _____ (BEngM.E. / BEngA.E. / BEngNRE)

Project Name: _____

_____

Project Duration: Start Time: _____ (month/year) Completion Time: _____ (month/year)

Supervisor Name / Signature: _____

CTO Signature: _____

Budget Limit: _____ Account Expiry Date: End of Semester B

The application period will be ended by the end of December each year. No application shall be approved after this date.

Budget Revision:

Revised Budget (if needed)				
Supervisor (Signature/Date)				
Chief TO (Signature/Date)				

I/We declare that I/we have read and understood and shall comply with the regulations provided overleaf.

Applicant(s) Signature: _____

(Student Name(s):)

Applicant(s) will be informed by email upon the application is approved.

*Remark: For very genuine need, students may request for addition budget for their project work. In this case, please bring along the copy of your original form and a written justification (with supervisor endorsement) to Chief Technical Officer for special approval.

Regulations on using consumable budget for all project students

1. Consumables are minor electrical, plastic, chemical and mechanical items that are recurrent in nature and their lifetime is short and the price for **such items should not greater than $1,000**.
2. **Stationery, books, and photo copies are not covered** by consumable account. If doubt, please ask the lab office before purchase.
3. All petty cash claim forms (printout forms) should be **attached with all original invoices and cash receipts or cash memos**. A single petty cash claim form should not exceed a total of HK$5,000. If you are doubt, please contact Mr. WC Li, our consumable coordinator at 34429393 .
4. All petty cash purchased items **must be claimed within 4 weeks** from the date of invoice. Any late submission will not be entertained and cannot be reimbursed.
5. If the price of your purchased item is greater than $1,000, you have to raise formal Purchase Request (PR). However, in this case, you have to allow long enough lead time for the delivery (usually more than one month).
6. Your consumable account expiry date is the end of Semester B of the current academic year.
7. All purchased items must be returned to the Lab after you have finished your project.
8. There is a stringent requirement in CityU that we have to use the least available freight charge for shipment. Do check with the Lab Office before you confirm the order with the vendor, particularly those online purchases. You may not be reimbursed the full freight charge if it is found too high.
9. It is important NOT to raise order with the vendor directly and ask Department to settle the bill. There is a lot of financial practice and procedures to govern this. Please consult the Lab Office for proper procedures if you deem require to raise order instead of petty cash purchase.
10. For reimbursement, your expense transaction will be sent to Finance Office (FO) and FO will transfer the money back directly to the bank account provided in your AIMS. As such, please make sure that you have a valid bank account information updated in AIMS. Normally, it takes about one month for FO to transfer the money back to your bank account.
11. For oversea purchase, the exchange rate may change everyday. Normally we shall use the exchange rate at the time you submit us the reimbursement claim form, unless you can provide us formal evidence of the exchange rate you used at the time you purchase.

Appendix VIII

List of consumables budget for different category of users

Project type	**Budget support (HK$)**
Final year projects for BEngM.E. / BEngA.E. / BEngNRE students	1,200 per project
Dissertation for MSME students	1,500 per project
RA and RS	No support (PI needs to transfer budget to Dept in order to create a consumable account for their use).

Appendix IX

香港城市大學
City University of Hong Kong

Internal memorandum

From	To FO - Treasury
Our reference	Copies to
Telephone	Your reference
Date	Dated

Re: Fund Transfer for creating a consumable account for research work

Please arrange to transfer the total amount of HK$xxxx from the below research account to MNE Consumable and Lab. Supply account 000-057-6202-631-1. Authorization signature and green chop from the research project accounts are attached for your records. If any transfer cannot proceed, please contact me at 3442 8673 at first instance.

Detailed transfer transaction:

Date of transfer	From Account	Amount (HK$)
yyyyy	Project zzzzzz	xxxx

Thank you for your attention.

Stamp the green chop: _____

_____

PI signature: _____

Chief Technical Officer

Appendix X

Department of MNE
City University of Hong Kong

Assignment of RA/RS as Qualified Staff to support FYP work

Academic staff please fill in this form properly whenever he/she wants to assign his/her RA/PhD students, or themselves, as qualified staff to support the FYP student to work in the Lab.

Academic Staff: _____

Name of Research Staff (PhD student) as qualified staff (or himself/herself):_____

Position: _____

*Period of Assignment: From (date): _____ To (date): _____

Lab room for the assignment: _____

Name and ID of FYP students the qualified staff will take care:

1. Name _____ ID ( ) 2. Name _____ ID ( )

3. Name _____ ID ( ) 4. Name _____ ID ( )

5. Name _____ ID ( ) 6. Name _____ _____ ID ( )

**usually the period of assignment should not extend for current academic year*

_____

Upon signing this form, the academic staff needs to ensure that the research staff so assigned are knowledgeable and skillful with what the FYP work is about. The research staff, when they allow the students to work at the designated lab, they have to sign on the logbook properly, be readily available in the Lab through the period the students are allowed to work in the lab area, and to take care of their safety at work.

Signature: _____
Academic Staff

Date: _____

Signature: _____
Research Staff (PhD students)

Endorsed by: _____(Chief Technical Officer)

Appendix XI

Department of MNE
Application form for equipment on-line booking system

Any research supporting staff (including FYP student) who want to book a major equipment via our online system for their research (FYP) work needs to obtain an account to logon the system. To do this, first of all, the staff and students needs to contact the technical staff in charge of the equipment, to obtain a briefing to make sure that they know how to use the equipment safely. Then, he/she has to sign the form, with their supervisor endorsement, and submit together with the risk assessment form.

This form should be used once for each Lab area.

Name of Research Staff(FYP student): _____ Email: _____

Name of Project Supervisor: _____ Email: _____

Department: _____

Name of the Lab area to enter: _____ Room No: _____

Equipment intend to use (can be more than one):

_____

_____

_____

Endorsed by Project Supervisor: _____ Date: _____

Endorsed by Technical in-charge: _____
(After proper safety training, risk assessment and equipment briefing)

Approved by Chief Technical Officer :_____

Important Note

1. *There is an hourly charging rate applied to each piece of equipment. For staff from other departments, please make sure that you have enough funding to pay for the charges every time you book to use the equipment. We shall invoice you regularly. (For internal staff, research students, and FYP students, a discount is usually given on the equipment hourly charging rate).*
2. *You have to strictly comply with the safety regulation and guideline when using the equipment.*
3. *Please return this form, completely signed, to the technical staff in charge of the equipment and he shall arrange for the training and create an account for you afterward.*
4. *The technical staff in charge reserves the right to adjust the booking schedule for any ad hoc and sudden events.*

The research staff/PhD student/FYP student who intend to use and operate the equipment in MNE lab confirms that he/she :-

- has conducted the CENG online safety training completely and successfully,
- has read thoroughly and carefully the MNE in-house safety rule and regulations as stated in the handbook,
- shall strictly comply with all such safety rule and regulations at all time,
- shall clean and tidy up the workplace at all time and operate the equipment carefully and keep it in good condition as much as he/she can
- has received adequate training to use the equipment properly and safely on their own

Research staff signature: _____

Date: _____

Appendix XII *Radiation Safety Guidelines*

All users of radioactive substances (RS) and irradiating apparatus (IA) should adhere to the CityU Radiation Safety Guidelines in order not to contravene the **Radiation Ordinance and Regulations** (http://www.info.gov.hk/dh-rhu/english/html/eindex.htm) of HKSAR government.

The University is no longer exempted by the Radiation Board from applying licence and formal licence must be held for the purchase, storage, use and transfer of all RS and IA.

- In this connection, prior approval is needed from **DRPO** (Departmental Radiation Protection Officer) and **URPO** (University Radiation Protection Officer) before purchasing or importing any IA/RS. The principle investigator, the project in-charge person or the IA/RS custodian should fill in a copy of **Appendix 3** of RP001 document before placing any Purchase Request for such an equipment or machine.
- Also, users of IA/RS need to submit a filled copy of **Appendix 1 and possibly Appendix 2A/2B** of RP001 document as well to DRPO and URPO for endorsement before using the IA/RS.
- Furthermore, users are advised that it is an offence to transfer/remove any licensed RS or IA from the University Campus. Any such transfer or removal requires the prior approval from the DRPO and URPO. Failing to do this will be resulted in prosecution.

For more details about the captioned Radiation Safety Guidelines (RP001), please download the full document from :

http://www6.cityu.edu.hk/fmo/studentlan/download/radiationsafetygl.pdf

Appendix 1

REGISTRATION FORM

FOR USERS OF RADIOACTIVE SUBSTANCE AND/OR IRRADIATING APPARATUS

1. Staff/student name : .....
2. Department/Division: .....
3. Post: .....
4. Telephone number: .....
   Fax number: .....
   E-mail address: .....
5. Nature/Description of work requiring registration :

   .....

   .....

   .....
6. Location(s) where the above work will be carried out :

   .....

   .....
7. I have attended the following radiation safety training course(s) (please show dates) :

   .....

   .....

STATEMENT OF COMPLIANCE

I agree to comply with the provisions of Document RP001/CityU RADIATION SAFETY in all work associated with radioactive substance and/or irradiating apparatus.

Signed .....

On completion please return this form to the Departmental Radiation Protection Officer (DRPO) in your department for approval, and then for onward transmission to the Safety and Health Unit of Facilities Management Office (FMO) for records and for arranging for final approval by the University Radiation Protection Officer (URPO). Upon final approval by the URPO, the Safety and Health Unit of FMO will officially notify you and your DRPO. You should not handle radioactive substances or irradiating apparatus before obtaining approval.

Endorsed by : ..... (DRPO)

Approved by : ..... Prof Peter Yu (URPO)

Date : .....

Date : .....

D:\OFFICE DATA\Year 2017\Tony\Safety\Radiation Safety Policy (May 2017)\Appendix 1 (Reg form) Jan 2017.doc

衞生署
Department of Health

Radiation Monitoring Service
輻 射 監 察 服 務

Radiation Monitoring Service Ref. No. (if any) 輻射監察服務檔案編號〈如適用〉 _____

Personal detail of dosimeter user
熱釋光劑量計使用者資料

This is to be completed by each user of the radiation monitoring service.
本表格請由每位輻射監察服務的使用者填寫

1. Name 姓名
   _____ 中文 (in Chinese)　_____ 英文 (in English)　_____ 姓 (Surname)　_____ 名 (Given name)

2. Sex 姓別 _____　Ward (if any) 工作間〈如適用〉 _____

3. Hong Kong Identity Card Number/Passport Number 香港身分證/護照編號
   _____ (Must fill out this item 必須填寫此項)

4. Date of birth 出生日期 _____ / _____ / _____
   Day 日　Month 月　Year 年

5. Date of first employment to radiation work 首次受聘從事輻射工作之日期 _____ / _____ / _____
   Date 日　Month 月　Year 年

6. Employer (Please tick as appropriate) 僱主（請在適當方格加上「✓」） government 政府 ☐　non-government 非政府 ☐

7. Type of worker 工作類別 _____
   (e.g. doctor, nurse, radiographer, other, please specify 例如：醫生、護士、放射技師或其他。)

8. Applicable only to personnels who are previously monitored by other service.
   此項只適用於過往曾接受其他監察服務的人士填寫。

   Cumulative radiation dose received : 累積輻射受量 _____ mSv 毫希沃特

9. Choice of service 選擇服務　☐ Whole body monitoring 全身監察　☐ Extremity(finger)monitoring 肢體〈手指〉監察

Signature 簽名 : _____

Date 日期 : _____

Please return this form together with the "Application for Radiation Monitoring Service " form to :
請將本表格連同"申請輻射監察服務"表格一拼交回：

衞生署放射衞生部
輻射監察服務
香港西灣河太康街二十八號
西灣河健康中心三樓

或電郵至：rhu-rms@dh.gov.hk

Radiation Monitoring Service
Radiation Health Unit
Department of Health
3/F., Sai Wan Ho Health Centre
28 Tai Hong Street
Sai Wan Ho, Hong Kong

Or e-mail to : rhu-rms@dh.gov.hk

We build a healthy Hong Kong and aspire to be an internationally renowned public health authority
我們要建設一個健康的香港並立志成為國際知名的公共衞生監管機構

RMS-19

http://www.info.gov.hk/dh-rhu/common_pdf/rms-19.pdf

寄：衞生署放射衞生部
輻射監察服務
香港西灣河太康街 28 號
西灣河健康中心三樓

或電郵至： rhu-rms@dh.gov.hk

To : Radiation Monitoring Service
Radiation Health Unit
Department of Health
3/F., Sai Wan Ho Health Centre
28 Tai Hong Street, Sai Wan Ho,
Hong Kong.

Or e-mail to: rhu-rms@dh.gov.hk

輻射監察服務

Radiation Monitoring Service

使用者之替換或調職資料

Replacement / Transfer of Dosimeter User

本署檔案編號 Our file reference : RMS/_____

公司名稱 / 政府部門
Company Name / Government Department : _____

☐ 政府 Government ☐ 非政府 Non-government

(1) 替換工作人員 Replacement of staff

替換前之人員 Present staff		替換後之人員 Replaced by	
姓名 Name	身份證號碼 ID card No.	姓名 Name	身份證號碼 ID card No.

請為每位新工作人員填寫 "熱釋光劑量計使用者資料" 表格

Please fill in the "Personal Detail of Dosimeter User" form of the new user .

(2) 調職人員（只供政府部門使用）Transfer of staff (for government department users only)

姓名 Name	身份證號碼 ID card No.	現時工作部門及單位 Present department and section	新工作部門及單位 New department section

聯絡電話 Tel No.: _____

申請人姓名
Name of applicant : _____ 日期 Date : _____

通訊地址
Correspondence address: _____

ISO 9001 : 2008 ISO 9001 : 2008 ISO 9001 : 2008

Radiation Monitoring Service
Radiation Health Unit
Department of Health
The Government of The HKSAR

We build a healthy Hong Kong and aspire to be an internationally renowned public health authority

我們要建設一個健康的香港並立志成為國際知名的公共衞生監管機構

Appendix 3

STATEMENT OF THE USE OF RADIOACTIVE SUBSTANCES AND/OR IRRADIATING APPARATUS

This form must be completed if you intend to import or use any radioactive substances or irradiating apparatus. You are required to list all of the substances and apparatus as required by this project.

Title of Proposal / Project : _____

Name of Principal Investigator (School / Department) : _____

You may not proceed with this proposal without the confirmation by your Departmental Radiation Protection Officer (DRPO) and the University Radiation Protection Officer (URPO).

Section A

The following radioactive substances (RS) and/or irradiating apparatus (IA) will be used in the proposed research project :

		Yes	No	Please list for each type :
1.	**Sealed RS** *(e.g. Cs-137 sealed source)*	☐	☐	_____
2.	**Unsealed RS** *(e.g. C-14 unsealed liquid)*	☐	☐	_____
3.	**Closed beam IA** *(e.g. XRF fully shielded machine)*	☐	☐	_____
4.	**Open beam IA** *(e.g. C-arm X-ray 100kV/10mA)*	☐	☐	_____

The purpose of using the radioactive substance/irradiating apparatus[+] is for : _____

_____

(Note : [+] delete those that do not apply)

Section B

Please answer the following:

i. **You have made available a Radiation Supervised / Controlled Area for the project.**
   - ☐ Yes. The research activities will be conducted in Room _____ which is a Radiation Supervised / Controlled Area.
   - ☐ No. I / We will convert Room _____ into a Radiation Supervised / Controlled Area once the proposal is granted.

ii. **Relevant RS / IA licence* is available.**
   - ☐ Yes. The available licence number is _____.
   - ☐ No. I / We will apply for the relevant licence once the proposal is granted.

   *(Note *RS / IA should have separate licences. Existing licence that does not include the new RS / IA to be purchased MUST be updated to include the new RS / IA either BEFORE purchasing the new RS / IA or according to instructions given by the Radiation Board of HKSAR.)*

iii. **You have carried out risk assessment (http://www6.cityu.edu.hk/fmo/studentlan/download/wsassessment.pdf) on your proposed research project.**
   - ☐ Yes.
   - ☐ No.

iv. **You have at least one staff member in your team who is a registered user for using the proposed RS / IA in the University.**
   - ☐ Yes. His / her name is _____ and staff / student number is _____ .
   - ☐ No.

v. **You have a clear plan for storage and disposal of RS / IA waste during the project period and after completion of the project.**
   - ☐ Yes. Please provide detail : _____
   - ☐ No.

Section C

Declaration of Principal Investigator (PI) :

I / We are aware of my / our safety responsibilities as PI(s) spelt out in the University's Safety Policy.
I / We will ensure that the facilities, safety equipment and procedures are in place to enable the work to be carried out in compliance with the Hong Kong Radiation Ordinance, its subsidiary Regulations, and corresponding licence conditions.
I / We will ensure that everyone carrying out the work is appropriately trained.
I / We will follow and ensure that others follow all relevant standard operating procedures.
I / We will report all near misses and accidents and all symptoms of relevance to what I am / we are working with.
I / We will also report any new conditions that arise, e.g. pregnancy, etc.
I / We will provide supervision and instruction to all personnel working on the project.

Signed : _____ Date : _____
(Signature of Principal Investigator)

Comments by the DRPO / URPO : _____

_____

Endorsed by : _____ Date : _____
(Departmental Radiation Protection Officer)

Endorsed by : _____ Date : _____
(University Radiation Protection Officer)

Appendix XIII

Useful Contact

General Enquiries

Senior Technical Officer	Mr KIAN Kwok Cheong	3442-8938	mekian@cityu.edu.hk
Senior Technician	Mr LI Jim Wai Ching	3442-9393	mejim.li@cityu.edu.hk

Fax numbers

Lab Office	3442-0416
General Office	3442-0235

WWW Home Page

Department home page(MNE) HTTP://www.cityu.edu.hk/mne

The LAB Information system (IntraMEL)
(By accessing the website www.meem.cityu.edu.hk/webapps/index.asp and click to select the "IntraMEL" application).

The LAB Consumable Control System
(By accessing the website www.meem.cityu.edu.hk/webapps/index.asp and click to select the "Consumable Control System" application).

Time-table, Roster Coordinator
Mr. KC Kian/WC Li (Sr. Tech. Officer/ Sr. Tech.) 3442-8938/9393

Safety and Security Coordinator
Mr. KC Kian (Sr. Tech. Officer) 3442-8938

Chemical Control Coordinator
Mr. WP Lau (Tech. 1) 3442-7010

Fixed Asset and Consumables Coordinator
Mr. WC Li (Sr. Tech.) 3442-9393

Laser Safety Coordinator
Mr. YIU Kelvin Chi Yan 3442 8026

Departmental Radiation Protection Officer
Mr. Jack Wong 3442 5717