



LABORATORY SAFETY HANDBOOK

**DEPARTMENT OF MECHANICAL AND MANUFACTURING ENGINEERING
FACULTY OF ENGINEERING
UNIVERSITI PUTRA MALAYSIA**



MECHANICAL AND MANUFACTURING ENGINEERING LABORATORY SAFETY NOTES

LAB RULES AND REGULATIONS

A. GENERAL RULES

1. Laboratory class times are at 8.00 am - 1.00 pm and 2.00 pm - 5.00 pm (Monday–Thursday), 8.00 am – 12.15 pm and 2.45 pm – 5.00 pm (Friday).
2. Although you may be admitted into a laboratory you are NOT allowed to commence work unless authorized to do so by a supervisor/assistant engineer.
3. You **MUST wear a safety shoes and proper workshop attire** at all times in the laboratory areas. Soft contact lenses should not be worn in a laboratory where hazardous chemicals are in use.
4. Be aware of the safety equipment available, its location and method of use, i.e. fire extinguishers, fire blankets, safety shower, eyewash stands, telephone, chemical
5. Observe and obey all safety sign and warnings.
6. Familiarize yourself with the layout of the building and its fire escapes.
7. DO NOT **EAT, DRINK or SMOKE** in the laboratories and workshops.
8. Smoking is prohibited in the laboratory.
9. Keep your work space clean and tidy.
10. Use common sense and do not rush in the laboratory. Never be complacent about chemicals or chemical reactions.
11. Horseplay of any sort is absolutely prohibited in the laboratory.
12. Please fill Laboratory Safety Form and Risk Assessment Form before starting your lab.
13. Get MSDS for every chemical purchase.
14. Know the hazardous characteristics of the materials you will be using in your experiment (from MSDS).
15. Keep the sink clean. Do not throw any unwanted chemicals or hazardous waste down the drain.
16. Do not store any food in laboratories. Do not use food containers to store chemicals or laboratory samples.
17. Sleeping is prohibited in the laboratory.
18. No operating equipment will be left unattended or notify the staff if the experiment is to be continued or equipment is to be 'ON' after office hours. A status signboard must be displayed prominently near the experiment/equipment if it is still running.
19. Do not overload the trench cover.
20. Report all accident/spillages to a supervisor/assistant engineer.

21. Unauthorized persons are not allowed to enter the laboratory. If it happens, the safety is at your own risk.

B. LABORATORY PROCEDURE

1. All students must inform the assistant engineer when they are about to commence work. No work can commence without permission from the laboratory assistant engineer.
2. No materials/equipment/laboratory property may be removed from the laboratory without permission from the laboratory assistant engineer.
3. Approval for working space, casting and storage of test specimens should be obtained from the laboratory assistant engineer.
4. Replace tools in their original place after use.
5. Oil waste should be disposed off properly to appropriate container/bin.
6. Always ensure the laboratory is clean and tidy both during and after use.
7. Advice and assistance must be sought by student before operate machine which they are not familiar.
8. Please always ensure all electrical tools are switch off before leaving the laboratory i.e. fan, etc.

C. WHAT SHOULD YOU DO WITH LABORATORY'S TOOL

1. Any damage to equipment or tools must be reported immediately to the laboratory assistant engineer.
2. No materials or equipment in the laboratory are to be used without permission from the laboratory assistant engineer.
3. Miscellaneous items i.e. hammer, spatula, spirit level, etc. can be signed out on the day of use and to be returned on the same day.

D. SPECIFIC RULES AT RESPECTIVE LABORATORY

I. MECHANICAL WORKSHOP GENERAL RULES AND REGULATIONS

1. Training for using equipment in Mechanical Workshop:

- Procedure of using equipment in the workshop:
- 1. Read the Laboratory Safety Handbook for safety guidance and fill in “**Risk Assessment**” form and “**Lab Safety Form**” (take the form from the entrance door of the Workshop) to the Laboratory personnel at the Mechanical Workshop. Please submit the form in 3 days working days for processing and approval.
- 2. Attend and pass the training provided by the Mechanical Workshop.
 - Upon approval the user can use the facilities in the workshop during standard operation hours. The machines can only be operated if a staff member of the Mechanical Workshop is present.
 - Do not operate any machines until you read the **Standard Operation Procedure** (the document is usually located near the machine), pass the training, fully understand the operation of the equipment and submit the indemnity form to the mechanical staff. Do strictly follow the rules of the Mechanical Workshop when using the facilities.
 - ASK if there is anything you do not fully understand.

2. Safety:

- Always use safety glasses, closed-toed shoes, hearing protection, face shield (if necessary) and lab coat (if necessary) and other suitable protective equipment during machining.
- No rings, wrist watches, bracelets or jewelry that can get caught in the equipment are allowed when using the machines. If you have long hair, make sure it is tied back and will not touch any part of the machine in particular the rotating spindle. Keep hands and arms well clear of the rotating spindle or other parts.
- Only operate the machine after informing the staff of the Mechanical Workshop. Make sure someone else knows that you are using the machine and is available in case of emergency.
- Do not interrupt anyone when they are operating the machine. Wait until they finish machining.

- Do not run in the workshop, it may cause severe accident. Always be patient and never rush in the workshop.
- Use the appropriate speed for the bit.
- Always remove the chuck key after tightening the chuck to avoid the chuck key from flying off during the start-up which can cause serious injury or death.
- Report any defective equipment to the mechanical staff.
- The gangway through the workshop must be kept clear. Any oil spillage, grease must be cleaned immediately and reported.

3. Emergency contact:

- Always know where the emergency stop button of the machine is. Press it if an accident occurs during machining.
- In case of any technical problems, call Mr. Mohd Saiful Azuar Md Isa at **019-5740979** or Ir Razali Samin at **03-8946 6340**.
- In case of accidents, administer proper First Aid (near the entrance door) and contact Abdul call Mr. Mohd Saiful Azuar Md Isa at **019-5740979** or Ir Razali Samin at **03-8946 6340**, Campus Security at **03-8946 7990/ 038947 19969/ 03-8946 7470** or Ambulance at **999**.

4. Clean up:

- Turn off the machine after use.
- Remove the bit after use and put it back to their proper location into the tool cabinet.
- Clean up the shaving debris, equipment and the working place thoroughly using brush. Wipe off the coolant and oil if using.
- Fill the log book properly.

5. Borrowing tools or equipment from Mechanical Workshop:

- Ask the mechanical staff and fill the loan book when borrowing or taking any tools or equipment from the workshop. Return after use in the time given.

6. Punishment:

Machining can be very dangerous!

If you break the rules, ***your supervisor will be informed and*** you may be ***banned to use the equipment or enter the workshop.***

II. MASS METROLOGY LABORATORY

This laboratory is designed for calibration service. Not open to student and client.

E. PENALTY OF LAB RULES VIOLATION

Students fail to abide to lab rules will be penalized according to the following procedures.

First offence: verbal warning from KM (Ketua Makmal)

Second offence: written warning from DSO (Department Safety Officer)

Third offence: Suspend from laboratory until further notice. Need to appeal by writing to Dept. HOD (Head of Department)

F. WORKING OUTSIDE OFFICE HOURS

1. No students are permitted to work outside office hours in the lab without the permission of the Supervisor, Department Safety Officer and Head of Department.
2. Please fill in all the necessary forms for working out of office hours and GET **APPROVAL FIRST BEFORE START DOING WORK.**
3. Students are no longer allowed to hold lab keys.
4. You are responsible for your own safety and please take extra precautions in lab.
5. If permission is given, you must not work alone unless accompanied by a member of staff/postgraduate student from Faculty of Engineering. The safety is at your own risk.
6. Fill in log book at lab for time in and out.

G. ACCIDENTS

- I. **Report all accidents**, no matter how trivial, on the day of occurrence to a supervisor and assistant engineer.
- II. First Aid Kit is available in each laboratory. Familiarize yourself with the kit.
- III. Fire.
 - a) Familiarize yourself with the location of fire extinguishers/fire hydrants.
 - b) Personal safety is most important. If a person's clothing catches on fire, he/she needs help. Prevent him/her from running. If he/she is close enough, put him/her under the safety shower because it is more effective than a blanket. If not, make him/her lie down and smother the flames by rolling, wrapping with lab coats, blankets, towels, etc. Never turn a carbon dioxide extinguisher on a person.

- c) If a fire breaks out, turn off all burners and remove solvents if time allows. There are carbon dioxide extinguishers in the laboratory and the positions and operation of these should be known. Point the extinguisher at the base of the flames. Very small fires can be put out with a damp towel by smothering. Only after the safety of all is assured should the matter of extinguishing the fire be considered.
- d) When the fire alarm sounds, leave the building immediately. Do not stop to collect personal belongings. Do not use the lifts. Shut doors behind you. Go to the assembly point and don't return to the building until you are told that it is safe for you to do so.

IV. Chemicals

- a) If corrosive chemicals are spilled on the clothing, immediate showering (with clothing on) is the best remedy. Safety showers are located in each laboratory. If chemicals are spilled on the skin, wash them off with large volumes of water.
- b) If corrosive chemicals are spilled on the desk, dilute them with a large volume of water and then neutralize with sodium bicarbonate if an acid, or dilute acetic acid if a base.
- c) For all chemicals, please refer to MSDS for specific safety procedure of the particular chemicals

H. CONTACT PERSONS

If you require advice, assistance or have a complaint concerning safety matters, first contact one or more of the following people:-

1. Your academic supervisor or research co-workers.
2. The Head of the Laboratory and Assistant Engineer in charge of that area.

Laboratory	Head of Laboratory	Assistant Engineer
Material Forming	Ir Razali Samin 03-8946 6340	Mr. Mohd Saiful Azuar Md. Isa 019-5740979
Manufacturing Technology and Automation	Prof. Dr. Shamsuddin Sulaiman 03-8946 6334	Mr. Tajul Ariffin Md. Tajuddin 019-6997199

Thermodynamics	Prof. Ir. Dr. Nor Mariah Adam 03-8946 6345	Mr. Noor Azmi Ismail 016-2476211
Fluid Mechanics	Dr. Siti Ujila Masuri 03-8946 4385	Mr. Ishak Mohd Yusof 03-8947 1985/012-3647701
CAD/CAM	Prof. Ir. Dr. Mohd khairol Anuar Mohd Ariffin 03-8946 6385	Mr. Mohd Hafizul Hashim 012-9095826
Dynamic & Vibration	Dr. Mohd Zuhri Mohamed Yusof 03-8946 6343	Mr. Mohd Zafri Mahdi 03-8947 1982/014-5085223
Control System and Instrumentation	Dr. Azizan As' arry 03-89464377	Mrs. Normahyon Mohd Mahayuddin 03-8946 6471/03-8947 1983/012-6535243 Mr. Mohd Saiful Azuar Md. Isa 019-5740979 Mr. Zulkefle Kasim 03-8946 6335/012-6215246
Strenght of Material	Dr. Eris Eliannddy Supeni 03-8946 6328	Mr. Muhamad Wildan Ilyas Mohamed Ghazali 012-2378085 Mr. Mazrul Mustapa Kamal 012-6907534
Mass Metrology	Assoc. Prof. Dr. B. T. Hang Tuah Baharuddin 03-8946 6329	Ms Normalina Jamaluddin 012-2661652

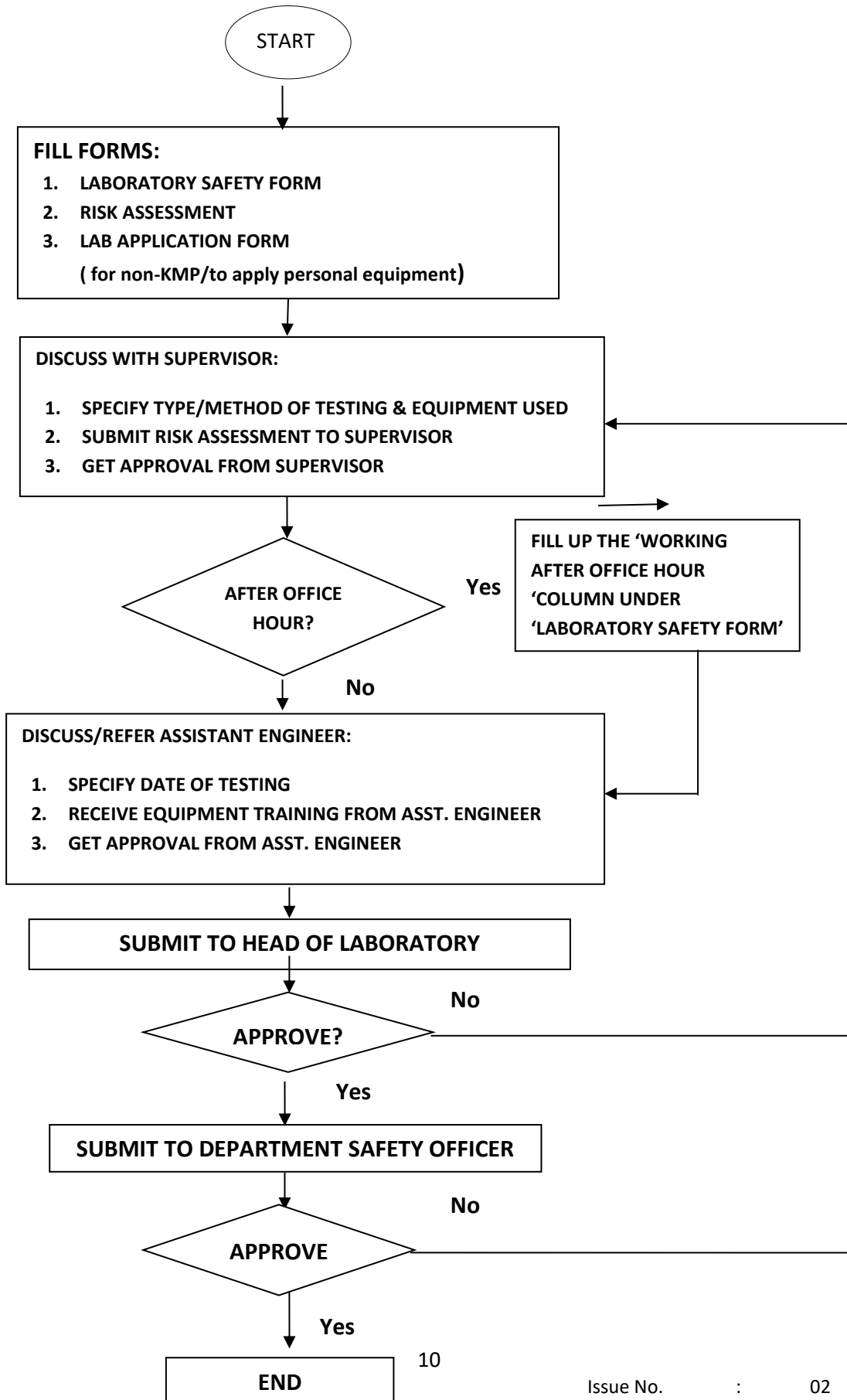
3. If you cannot reach any of the above or are not satisfied with their response then contact:-

- a) Department Safety Officer, (03-8946 4377)
- b) Head of Department (03-8946 6336)
- c) Department Representative, Science Officer (03-8946 4460)

Emergency Contact Number:

UPM Security Control Centre (Pusat Kawalan Bahagian Keselamatan UPM)	03-8946 7990/03-8947 1999/ 03-8946 7470
Emergency Unit Universiti Health Centre (Unit Kecemasan Pusat Kesihatan Universiti)	03-8946 7332 / 7334
Serdang Hospital (Hospital Serdang)	03-8947 5200
Serdang Police Station (Balai Polis Serdang)	999 / 03-8948 2222
Seri Kembangan Fire Service (BOMBA Seri Kembangan)	999/ 03-8941 6281 / 03-8941 7635
Mr. Fahrul Asmady bin Yunus (Secretary of JKPP)	03-8946 6282

PROCEDURE OF WORKING IN LABORATORY



After reading this document, please sign and return the Laboratory Safety Form to the Head of Laboratory. A copy of the laboratory safety manual may be obtained from the Laboratory or through Mechanical and Manufacturing Engineering Department's website

http://www.eng.upm.edu.my/upload/dokumen/FKJUR1_PERMOHONAN_PENGGUNAAN_PERALATAN - 160310.pdf

GENERAL INSTRUCTION:

1. YOU ARE RESPONSIBLE NOT ONLY FOR YOUR OWN SAFETY BUT ALSO FOR THE SAFETY OF OTHERS!"
2. AS POSTGRADUATES YOU WILL BE EXPECTED TO SHOW A GREATER UNDERSTANDING FOR AND ADHERENCE TO, ALL NATIONAL AND LOCAL SAFETY RULES AND REGULATIONS.

Please comply with the following:-

1. LABORATORY TIMES: 8.00am-5.00pm. WORKING IN A LABORATORY ALONE OUT OF OFFICE HOURS IS NOT PERMITTED.
2. ALTHOUGH YOU MAY BE ADMITTED INTO A LABORATORY YOU ARE NOT ALLOWED TO COMMENCE WORK UNLESS AUTHORISED TO DO SO BY A SUPERVISOR/ASSISTANT ENGINEER.
3. YOU MUST WEAR PROPER PERSONAL PROTECTION EQUIPMENTS (PPEs) SUCH AS SAFETY SHOES, SAFETY HAT, SAFETY SPECTACLES, ETC.
4. TAKE NOTE OF THE SAFETY EQUIPMENTS AVAILABLE, ITS LOCATION AND METHOD OF USE, I.E. FIRE EXTINGUISHERS, EYEWASH BOTTLES, AND FIRST AID KITS.
5. FAMILIARISE YOURSELF WITH THE LAYOUT OF THE BUILDING AND ITS FIRE ESCAPES.
6. DO NOT EAT, DRINK OR SMOKE IN THE LABORATORY.
7. IN THE EVENT OF AN ACCIDENT, IT IS ESSENTIAL THAT ANY INJURY BE REPORTED TO A ASSISTANT ENGINEER AS SOON AS POSSIBLE. A REPORT OF THE ACCIDENT WILL THEN BE FORWARDED TO THE DEPARTMENTAL SAFETY REPRESENTATIVE.
8. REPORT ALL ACCIDENT/SPILLAGES TO A SUPERVISOR/ ASSISTANT ENGINEER
9. DO NOT DISPOSE OF UNKNOWN CHEMICALS DOWN THE LABORATORY SINK. REFER SUPERVISOR/ ASSISTANT ENGINEER FOR ADVICE.

ALWAYS REMEMBER

DO NOT USE ANY EQUIPMENT, UNLESS YOU ARE ABSOLUTELY CERTAIN OF ITS CORRECT METHOD OF OPERATION & DO NOT HESITATE OR FEEL EMBARRASSED ABOUT ASKING FOR HELP.

