DON BOSCO COLLEGE - TURA

STANDARD OPERATING PROCEDURE (SOP)

STANDARD OPERATING PROCEDURES (SOPs)
DEPARTMENT OF BOTANY

The following SOPs are to be strictly followed for the safety of students and staff of Botany Department during the conduct of practicals and theory classes:

1. The practical halls will be disinfected daily with 0.5-1% Sodium hypochlorite solution or sanitizers by the Lab Assistant before and after the practical.
2. Practical requirements are to be kept ready one day in advance, or well before the start of the practicals.
3. ***Letter of Consent*** from Parents/ Guardians must be submitted to the Deptt./H.O.D before the commencement of the Practicals.
4. Thermal scanning and Hand sanitization are to be done at the College Entrance Gate before entering the college Practical Hall.
5. Kindly DO NOT come to the Practical Hall if:
   a) any member of your family is tested Covid positive.
   b) you are suffering from cold and cough, body-ache, throat irritation and congestion.
   c) any member of your family visited a Covid positive patient or person.
6. In order to avoid crowding, a maximum of 12-15 students will be allowed in a practical hall at a time.
7. Only 2 (Two) students will be seated on a bench, maintaining 6 feet distance.
8. Please wear a standard safety mask that offers maximum protection.
9. Bring your own personal practical apparatuses. Exchange/ Sharing of any items will not be allowed.
10. Always maintain minimum distance at the time of instruction, interaction in the Practical Hall.
11. While performing practical, you must wait patiently at the time of collection of chemicals, or any such items.
12. Do not rush while handling acids or such hazardous chemicals.
13. All waste or unused items must be disposed of with care. Use the waste bin provided in the Hall.
14. Avoid intermingling in the hall.
15. Please handle all Lab equipments/apparatuses with care.
16. Always wash your hands with soap after touching common equipments, apparatuses, etc.
17. Taking Food and Tiffin will not be allowed in the Practical Halls.

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SOP for Chemistry Laboratory

Our prime motto is: **"SAFETY FIRST AND FOREMOST"**

Chemistry laboratories are potentially dangerous workplace, where staff and students are involved with handling of some potentially toxic, flammable and explosive compounds, abnormal temperature and pressure conditions and analytical equipments. Therefore, there are significant risks of error and mishaps. However, with proper precautions and guidance, even toxic chemicals can be handled to avoid accidents. With proper awareness of safe working practices by associated members working in chemistry laboratories, we can ensure a "Safe and healthy" working environment for all the members associated with the Discipline of Chemistry.
Here, we provide some general guidelines to encourage safe working practices in our laboratories.

GENERAL LABORATORY SAFETY PROCEDURES:

- In Chemistry laboratory, a student is required to handle chemicals that are carcinogenic, poisonous, flammable, and explosive.
- Some of the chemicals and equipment may cause severe burns, cuts, or bruises if not handled properly / carefully.
- Most of the accidents that occur in the chemistry laboratory are a result of carelessness, impatience, improper or unauthorized handling / experimentation, and negligence of safety rules and proper operating procedures.

In order to minimize the chance of accidents in the laboratory certain rules and regulations must be obeyed at all times while one is working or observing in a chemical laboratory. Therefore, it is not advisable for anyone to work in the laboratory without proper knowledge of the dangers involved. Due to the inherent dangers present in a chemical laboratory exercise, it should be understood that the following rules must be obeyed at all times, to minimize chances of any accident. Students are expected to exercise proper judgment and be extremely cautious at all times while working in the laboratory.

Students are advised to Learn and follow the following laboratory safety rules and regulations:

1. Be sure that you understand every instruction before proceeding towards Laboratory.
2. DO NOT perform unauthorized experiments or work in the laboratory alone.
3. PPE: Personal Protective Equipment (EYE PROTECTION and CLOTHING): Appropriate clothing must be worn at all times while in the laboratory. Approved laboratory coat or apron must be worn. Your legs must be completely covered below the knee by your choice of clothing. Approved eye protection may be worn in the laboratory. Eye protection must be

splash proof chemical goggles and be approved by your instructor. Always wear eye protection in the lab, even if you are not doing any experiment. Hazards can come from other student's experiments, not just your own. If you do get any chemical in your eyes, rinse your eyes immediately with sufficient water.

4. Long hair and loose clothing must be confined while in a laboratory.
5. Closed shoes with socks must be worn at ALL times. Open-toed shoes, backless shoes, sling backs, clogs, and sandals are not permitted.
6. Know the location and proper use of fire extinguishers, fire blankets, safety showers, eye wash devices and first aid kits.
7. Before handling any chemicals, read the label on the reagent bottles carefully.
8. Eating, smoking and drinking are not allowed in a chemistry laboratory.
9. Use the fume hoods or perform experiment under exhaust fan when toxic or irritating vapors are involved.
10. Never force glass tubing through cork or rubber stoppers without proper lubrication.
11. Never direct the open end of test tube / ignition tube toward yourself or anyone else.
12. Never pour water into concentrated acid.
13. Learn the proper procedure for igniting and operating a laboratory burner. Always extinguish the flame when the burner is not being used. Make sure that all flammable reagents are well removed before lighting the burner.
14. Chemical wastes must be disposed of properly at all times.
15. Never place chemicals directly on the balance pan. Always use a proper weighing container when using a balance to weigh a chemical. Never pour chemicals directly over the balance.
16. Never return unused chemicals to their original container (unless directed to do so by the instructor).
17. Securely replace lids, caps, and stoppers after removing reagents from containers.
18. Always wipe spatulas clean before and after inserting into reagent bottles.
19. Report any accident and/or injury, however minor, to your instructor immediately.
20. Never place anything that is not directly required for the experiment on laboratory desks; other items may interfere with the experiment.
21. All personal belongings should be placed in the shelves as you enter the laboratory.
22. Clean up any spill immediately with the help of Laboratory Assistant.
23. Before leaving the laboratory, make sure your work area is clean and dry. Ensure that all gas, water, vacuum, and air valves are completely turned off.
24. Thoroughly wash your hands before leaving the laboratory.

25. Your instructor is available for any assistance you may need. Never hesitate to ask questions especially if there is any question concerning proper operating procedure.
26. In case of any mishap, please contact the following persons
    i) Laboratory Assistant / Teacher concerned.
    ii) Head of the Department
    iii) Principal

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Head

Department of Chemistry

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Physics Laboratory - Standard Operating Procedure

The following are the Standard Operating Procedure (SoP) for students, faculty and staff.

General Physics Laboratory safety practices

There are many types of experiments carried out in the Physics Laboratory. We will first list the generalSoP applicable at all times.

1. Students must avoid bringing bags into the working area of the laboratory. This is to prevent accidental damage to the instruments or the bags and to avoid cluttering of the working table thatmight disturb the experiment.
2. No instruments or any material is to be taken from the laboratory without the express permissionof the teachers or laboratory assistant.
3. Every object taken from the laboratory must be duly entered in the register.
4. At the end of the experiment, the student must submit the equipment to the laboratory assistant,even if the experiment is incomplete.
5. Any damage to any equipment must promptly be informed to the teachers or the laboratoryassistant.
6. Prior permission from the teachers must be obtained for performing experiments at unallocatedtimes.
7. Any injury to any student caused by an equipment must be brought to the notice of the teachers orlaboratory assistant immediately.
8. During emergencies like fire and earthquake, the students, teachers and the laboratory assistantwill follow safety guidelines and exit in an orderly fashion; equipment and bags can be left behind as health and safety are bigger concerns.

Safety when handling experiments on heat

1. Currently, either a heater or hot plate is used for doing experiments on heat. Students should firstconsult the teachers or the laboratory assistant before starting on such experiments.
2. The student should be careful at all times during such experiments.
3. Any experiment that involves heat, should never be left unattended. At least one student from thegroup should be attending the experiment. In case of any untoward incident like melting wires, boiling out of the liquid, the student should inform the teachers or the laboratory assistant immediately and should not try to solve the problem himself/herself.
4. Tongs should be used for handling hot objects.
5. Easily flammable clothes should be avoided when doing heat experiments by both students andfaculty.

Safety when doing electricity experiments

1. Although we do not have any high voltage experiments, but the students should be careful whendoing electricity experiments.
2. He/she should not touch any wires if his/her hands are wet, even for low voltage equipment.
3. After many any circuit connection and before switching on the instrument, the student must showthe connections to the teachers or the laboratory assistant. This is to avoid damage to the instrument due to wrong connections.
4. For instruments requiring battery eliminator, the students should use the lowest voltage possibleand should not exceed 4 Volts generally. Use of higher voltage should be done with the consentof the teachers or the laboratory assistant.

Safety when doing optical experiments

1. Although we do not have any lasers or high-powered light sources for our experiments but someprecautions should be taken.
2. The students should not strain his/her eyes for extended periods of time when doing experiments,particularly in the dark room. They should take break of about a minute after every 10 minutes ofwork.
3. The sodium bulbs are fragile and hence should be handled with extreme care. The student shouldnotify the teachers or the laboratory assistant about any problem in the instrument and should nottry to solve the problem himself/herself.
4. The pins used in the optical bench are sharp and should be placed with the pointed part inside thegroove when not in use.

Additional guidelines to be followed in view of thecovid-19 pandemic.

1. Students, the teachers or the laboratory assistant must sanitize his/her hands when entering thelaboratory.
2. Students, the teachers or the laboratory assistant must sanitize his/her hands when exiting thelaboratory after finishing all experiments.
3. Mask should be worn at all times.
4. Social distancing should be maintained at all times.
5. Students, should avoid mixing with people outside of their practical group during experiments.
6. All library work should be done before starting the experiment.
7. The teachers and the laboratory assistant are advised to wash hands regularly.
8. Every equipment should be sanitized before handing it over to the next group.

9. Avoid throwing food stuffs in the laboratory dustbin.
10. The rooms should be as much ventilated (by keeping the windows open) as possible withoutdisturbing the experiments.
11. Smaller groups to be made and experiments should be performed batch-wise.

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Department of Zoology

The department came into existence from the year 1992 for undergraduate studies. Since then, the department has three laboratories, two lecture classes and one store room along with the department staff room. These infrastructure facilities are to augment the laboratory functioning of the department. There is regular four teaching staff members and a laboratory assistant to cater to the needs of the department and its laboratory.

1. **Standard Operating Procedures for the Laboratory**

   Laboratory includes the space where experiments are done and includes equipment, consumables, components, electrical appliances, chemicals, glassware along with safety equipment required for the conduct of experiments in the laboratory.

   Store is the location where newly purchased equipment / consumables are stored till there is a requirement for the same.

   Stock register is the record of all equipment and consumables that are available for use in the laboratory.

2. **Discipline**: Anyone entering the laboratory, being a place with equipment that are of value, should adhere to the disciplines of the laboratory.

   Laboratory discipline includes:

   a. Adhering to the laboratory safety procedures and protocols
   b. Reporting damaged / missing equipment to the course teachers / labassistants.
   c. Adhering to the timelines for replacement of damaged equipment, if any.
   d. Usage of all equipment as per the guidelines stated in the user manuals /standard procedures instructed by the course teacher
   e. Properly replacing the items to their original positions after completing the experiment.
   f. Following all standard procedures instructed by the course teachers which are:
      i. Students are oriented and re-oriented about lab rules and safety precautions during the start of each semester and in their first lab classes.
      ii. Instructions regarding handling hazardous chemicals, disposal of wastes, cleaning up of spills and operation of instruments are given.
      iii. The instructions are reiterated verbally and also through printed information in lab manuals.

3. **Safety**: Equipment / Chemicals in a laboratory may pose risk of damage to life andproperty. Hence all safety protocols needed for safe operation / safe handling of equipment / chemicals must be followed and may include-

a. Ensuring adequate insulation from earth when handling electrical equipment andwiring.

b. Ensuring that anyone entering the laboratory wears a foot wear at all times wheninside the laboratory

c. Complying with all the safety instructions given by the instruction manual of theequipment or instructed by the course teacher

d. Ensuring the presence of proper exhaust mechanism when dealing with toxic chemical fumes.

e. Wearing gloves and other protective equipment wherever and whenever required.

f. Availability of First Aid box in the laboratory must be ensured. In case of any accident, seek urgent medical attention after administration of first aid in the premises.

4. **Procurement of Equipment/ Chemicals / Glassware**

a. The staff members of the department (the internal committee) takes the initiativeto place the requirements before the HOD as and when required. The HOD thereafter places the requirements before the administration (principal).

b. Requisition from faculty for requirement of equipment/ Chemicals / Glassware in every academic year is taken.

c. The lab-in-charges inform the teacher- in-charge about the stock of chemicals.

d. Call for quotations is done by the principal and purchases too.

e. Order is placed through Principal's office.

f. The equipment and chemicals are entered in the main stock register of the department.

5. **Maintenance of Glassware**

a. Glassware needed for each class is issued to students, who use them when needed. Breakage has to be replaced by either a student or the entire class as decided by the faculty in-charge of glassware.

b. After a practical is completed for a class the glass wares are properly cleanedand kept in order for reuse for the next class. Washing of the glass wares are done both by students and lab assistant as and when situation demands.

c. Glass wares are segregated and stored in different boxes depending on the type of glass wares for easy retrieval during the next practical.

6. Maintenance of equipment

a. It is the primary responsibility of the Lab Assistants to ensure propermaintenance of equipment to ensure their long life.

b. Any improper use must be duly reported to the Head of the Department or theCourse teacher concerned.

7. The equipment's are used adhering to the protocol which comes along with theequipment and maintenance is done as and when required and feasible.

8. Maintenance of chemicals

a. Chemicals are arranged in alphabetical order, enabling easy retrieval andreplacement.

b. Chemicals are stored appropriately at proper temperature and storage conditions,classified as solvents, acids, hazardous, volatile, etc.,

c. Students are also allowed to prepare chemicals for their works but under theguidance of the supervising teacher meant for the purpose

9. Breakage

a. Any loss or damage to equipment must be reported and must be investigated.

b. If the damage is due to misuse / incorrect / wrong usage of the equipment not adhering to the standard operating procedure of the equipment, the equipment must be replaced with equivalent equipment by the person responsible for the act of commission or omission.

c. Any damage caused by normal wear and tear is not attributable and the procedure for condemning the equipment must be followed.

d. Any damage which is not attributable to a single person shall be replaced collectively by the group (may be a whole class or department).

10. This document, or part thereof, is amenable from time to time as per the requirements from time to time.

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