

# **Laboratory Safety Rules, Procedures and Regulations**

## **OPTO-BIOMEDICAL MICROSYSTEM LABORATORY** (obmslab.com)

**DEPARTMENT OF BIOTECHNOLOGY & MEDICAL ENGINEERING**  
**National Institute of Technology, Rourkela**

### **LABORATORY SAFETY RULES**

The Department of Biotechnology & Medical Engineering is committed to providing a safe laboratory environment for all students. The department requires the students, staff, and faculty to adhere to basic General Laboratory Safety Rules in all department-operated labs. Using laboratory equipment to perform any experiment contains some risk elements, particularly in the Opto-Biomedical Microsystem Laboratory. Safe working habits are essential for your safety and the safety of others around you.

Ensuring OBMS laboratory safety is not just the responsibility of the instructor: it is the responsibility of everyone working in the laboratory. You are expected to be familiar with the safety rules and to conduct your laboratory work in a safe manner at all times. The laboratory instructor will review the following safety rules and regulations with you and will point out the location and operation of the safety equipment (e.g. emergency eyewash station) and other available safety equipment.

### **GENERAL LABORATORY SAFETY RULES**

- Smoking, including electronic cigarettes, is prohibited in all laboratories.
- Shoes shall be worn that provide full coverage of the feet, and appropriate personal clothing shall be worn in laboratories.
- Students shall be familiar with the locations and operation of safety and emergency equipment such as emergency power off, emergency telephones, and emergency exits.
- Do not displace or remove laboratory equipment without instructor or technician authorization.
- Never open or remove the cover of equipment in the laboratories without the instructor's authorization.
- Report all problems to the Lab Technical Assistant or the Faculty in charge.
- In case of emergency, call Campus Security at 278-6900 or 278-6000 or dial 911.

### **ELECTRICAL SAFETY GUIDELINES**

- Get familiarize before and do No experiments should be performed in the absence of the laboratory instructor/ faculty.

- Before equipment is made live, the students should ask the laboratory instructor/ faculty to check the circuit connections and layout.
- Never make any changes to circuits without first isolating the circuit by switching off and removing connections to supplies.
- Voltages above 50 Vrms ac and 50 V dc are always dangerous. Extra precautions should be considered as voltage levels are increased.
- Be familiar with the locations and operation of safety and emergency equipment, such as emergency power off of the lab.
- Remove metal bracelets or watchstraps.
- Use extension cords only when necessary and only on a temporary basis.
- Do not use damaged cords, cords that become hot, or cords with exposed wiring. Inform the instructor about damaged cords.
- Know the correct handling procedures for batteries, cells, capacitors, inductors, and other high-energy storage devices.
- Inform your instructor if experiments are left unattended. Such experiments should be isolated from the supplies.
- If, for a special reason, it must be left on, a barrier and a warning notice are required.
- Equipment found to be faulty in any way should be reported immediately and not used until it is inspected and declared safe.
- Report accidents as soon as possible to the Lab technician or the faculty in charge of the lab. Emergency service is available 24 hours a day at ext. 6100.

## **ELECTRICAL EMERGENCY RESPONSE**

### **1. Electric Shock**

- Each lab has an Emergency Power Off button. Localize the Emergency Power Off button in your lab at the beginning of the semester.
- A serious electrical shock can make a person unconscious. Immediately turn off the electrical power source if the victim is still in contact with the electrical current
- If it is too risky or you cannot disconnect the power source, push the Emergency Power Off button.
- When you provide help, do not touch a victim that is still in contact with a power source.
- Call the Lab incharge at 2299

### **2. Electrical Fire**

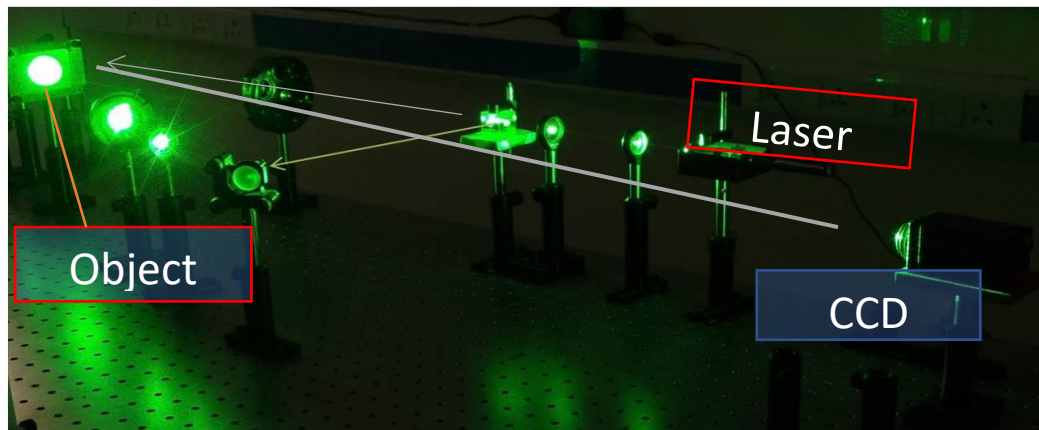
- If a small electrical fire occurs, try to disconnect the electrical power source, if possible.
- Do not put yourself at risk.
- Do not use water on an electrical fire.

### **3. Soldering**

- Always check the mains lead and plug for damage before starting soldering work.
- Serious burns can result from the hot iron or solder. Practice caution when you use the soldering iron. Watch for yourself and others near you.

- There is also the risk of electric shock if the soldering equipment has a damaged lead or exposed wiring.
- There is a risk from the flux fumes. The vent should be turned on to minimize the inhalation of the fumes. Stop immediately and try and get some fresh air if you don't feel good.
- Solder contains lead. Wash your hands thoroughly after completing soldering work.

#### 4. Opto-Biomedical Safety



- Optical experiments would be allowed to perform once the basic expertise is gained regarding the handling of equipments/ components.
- New beginners are ought to complete the required Environment, Health and Safety (EHS) training prior to beginning the work. Training courses are under the development [www.obmslab.com/labtraining](http://www.obmslab.com/labtraining). Students should familiarize themselves with the Lab safety Manual.



- Store chemicals in appropriate storage locations. Do not store chemicals on floors and keep storage outside chemical cabinets to a minimum. Remember: Food and Beverages are not allowed in the laboratory!

## 5. Microfabrication

- Incorporate risk assessments when planning out experiments, and write Standard Operating Procedures before beginning new processes/ operations.
- Plan for emergencies and know the location of emergency eyewashes and showers, spill kits, fire extinguishers, and fire pull stations.
- Do not work alone with highly hazardous materials or operations.
- Wear PPE and appropriate apparel, including clothing that covers the legs, closed toe solid top shoes, and safety glasses; wear gloves and a lab coat when working with hazardous materials.
- Follow additional PPE requirements based on the PPE hazard assessment tool.
- Label all chemical containers, including oil/water baths, squirt bottles, etc.
- Label all hazardous waste containers with the full chemical names of the contents and the words “hazardous waste”.
- Ensure these containers are capped when waste is not being added. Keep aisle ways clear.
- Do not block access to emergency equipment or exits.

## 6. Biological safety



- Clean lab coats must be clad before starting an experiment.
- Gloves are mandatory to wear while handling any biological chemicals or cell-culture plates.
- UV laminar flow machine must be operated with correct knowledge. The glass lid must be closed always while UV sterilization is going on.
- The laminar hood should be UV sterilized 30-minute prior to work. Care must be taken to avoid exposure of chemicals to UV light.
- Laminar hood must be cleaned and sterilize after the work. It must be ensured that it is turned off before leaving the lab. No refrigerators should be turned off without informing.

- People must immediately inform if any of the refrigerators (-20°C or -80°C) is not functioning properly.
- No chemicals must be used or touched without informing the lab-in-charge.
- All pipettes must be graduated in their respective dimension after use without fail and all the pipette tips should be disposed off at the proper location.
- Before starting an experiment, adequate knowledge about the parameters and requirements of the experiment must be acquired.
- Wash yourself if any chemical is spilled over you. In case of hazardous chemical, report immediately without hesitation.

