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		Criterion- IV
		Metric - 4.4.2

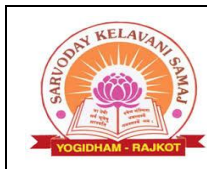
4.4.2	<b>There are established systems and procedures for maintaining and utilizing physical, academic and support facilities - laboratory, library, sports complex, computers, classrooms etc.</b>
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### LIFE SCIENCE GOOD LABORATORY PRACTICES


There is a certain element of risk in anything you do, but the potential risks in a microbiology course are greater. Persons who work in a microbiology lab may handle infectious agents in addition to other hazards such as chemicals and radioactive materials. There have been many documented cases of lab personnel acquiring diseases due to their work. About 20% of these cases have been attributed to a specific incident, while the rest have been attributed to work practices in the lab. It is possible that you can be exposed to potentially harmful microbes when you isolate bacteria from environmental materials. So, you should consider environmental samples potentially hazardous and use BSL2 containment practices (see below). If you are immune compromised or immune suppressed, then you may be at greater risk of acquiring infections in this class than most students and should carefully consider whether you should enroll in this course. A microbiology laboratory is a unique environment that requires special practices and containment facilities in order to properly protect persons working with microorganisms. Safety in the laboratory is the primary concern. The three main elements of safe containment of microorganisms are (1) good laboratory practices and technique, (2) safety equipment, and (3) facility design.

#### **Lab Practices and Safety Rules**

1. Wash your hands with disinfectant soap when you arrive at the lab and again before you leave.
2. Absolutely no food, drinks, chewing gum, or smoking is allowed in the laboratory. Do not put anything in your mouth such as pencils, pens, labels, or fingers. Do not store food in areas where microorganisms are stored.
3. Purchase a lab coat and safety glasses, bring them to lab and use them. Alternatively, a long sleeved shirt that buttons or snaps closed is acceptable protective clothing. This garment must cover your arms and be able to be removed without pulling it over your head. Leave protective clothing in the lab and do not wear it to other non-lab areas.
4. Avoid loose fitting items of clothing. Wear appropriate shoes (sandals are not allowed) in the laboratory.
5. Keep your workspace free of all unnecessary materials. Backpacks, purses, and coats should be placed in the cubbyholes by the front door of the lab. Place needed items on the floor near your feet, but not in the aisle.
6. Use hair cap and slippers in lab.



7. Disinfect work areas before and after use with 70% ethanol or fresh 10% bleach. Laboratory equipment and work surfaces should be decontaminated with an appropriate disinfectant on a routine basis, and especially after spills, splashes, or other contamination.
8. Label used glass wares clearly.
9. Replace caps on reagents, solution bottles, and bacterial cultures. Do not open Petri dishes in the lab unless absolutely necessary.
10. Inoculating loops and needles should be flame sterilized in a Bunsen's burner before you lay them down.
11. Turn off Bunsen's burners when not in use. Long hair must be restrained if Bunsen burners are in use.
12. When you flame sterilize with alcohol, be sure that you do not have any papers under you.
13. Do not enter in lab when you are ill, infected with disease or have wounds, unless it gets cured.
14. Do not sneeze or cough. In laboratory do not touch to any bare body part especially like eyes, nose, underarms etc.
15. Treat all microorganisms as potential pathogens. Use appropriate care and do not take cultures out of the laboratory.
16. Wear disposable gloves when working with potentially infectious microbes or samples (e.g., sewage). If you are working with a sample that may contain a pathogen, then be extremely careful to use good bacteriological technique.
17. Sterilize equipment and materials.
18. Never pipette by mouth. Use a pipetting aid or adjustable volume pipettors. (In the distant past, some lab personnel were taught to mouth pipette. This practice has been known to result in many laboratory-acquired infections. With the availability of mechanical pipetting devices, mouth pipetting is strictly prohibited.)
19. Consider everything a biohazard. Do not pour anything down the sink. Autoclave liquids and broth cultures to sterilize them before discarding.
20. Dispose of all solid waste material in a biohazard bag and autoclave it before discarding in the regular trash.
21. Familiarize yourself with the location of safety equipment in the lab (e.g., eye-wash station, shower, sinks, fire extinguisher, biological safety cabinet, first aid kit, emergency gas valve).
22. Dispose of broken glass in the broken glass container.
23. Dispose of razor blades, syringe needles, and sharp metal objects in the "sharps" container.
24. Report spills and accidents immediately to your instructor. Clean small spills with care (see instructions below). Seek help for large spills.
25. Report all injuries or accidents immediately to the instructor, no matter how small they seem.

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## **Laboratory Safety Equipment**

### **Biological Safety Cabinet**

A biological safety cabinet (BSC) is used as a primary barrier against exposure to infectious biological agents. A BSC has High Efficiency Particulate Air (HEPA) filters. The airflow in a BSC is laminar, i.e. the air moves with uniform velocity in one direction along parallel flow lines. Depending on the design, a BSC may be vented to the outside or the air may be exhausted into the room. BSCs are not chemical fume hoods. A percentage of the air is recirculated in most types of BSCs. HEPA filters only trap particulates, allowing any contaminant in non-particulate form to pass through the filter.


Proper Use of BSCs:

1. Operate the cabinet for five minutes before and after performing any work in it in order to purge airborne contaminants.
2. Before and after use, wipe the surface of the BSC with a suitable disinfectant, e.g., 70% alcohol or a 10% bleach solution.
3. Place everything you will need inside the cabinet before beginning work, including a waste container. You should not have to penetrate the air barrier of the cabinet once work has begun.
4. Do not place anything on the air intake grills, as this will block the air supply.
5. You should prevent unnecessary opening and closing of door because this will disrupt the
6. airflow of the cabinet.
7. Always wear a lab coat while using the cabinet and conduct your work at least four inches inside the cabinet.
8. Place burners to the rear of the cabinet to reduce air turbulence.
9. Do not work in the BSC while the ultraviolet light is on. Ultraviolet light can quickly injure the eye.
10. When finished with your work procedure, decontaminate the surfaces of any equipment.
11. Remove the equipment from the cabinet and decontaminate the work surface.
12. Thoroughly wash your hands and arms.

### **Cleaning Small Spills**

First, contact your instructor or the Biology Department Safety Officer. If it is a small spill of a low hazard microorganism or sample, then you should clean the spill yourself.

The proper procedures for cleaning small spills of microorganisms or samples (BSL1 and BSL2 levels):

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1. Wear a lab coat, disposable gloves, safety glasses or a face shield, and if needed, approved respiratory equipment.
2. Soak a paper towel(s) in an appropriate disinfectant (70% ethanol or fresh 10% bleach solution) and place around the spill area.
3. Working from the outer edges into the center, clean the spill area with fresh towels soaked in the disinfectant. Be sure to decontaminate any areas or surfaces that you suspect may have been affected by the spill. Allow 10 minutes contact time.
4. Place the paper towels and gloves into a biohazard bag and autoclave these materials to sterilize them.
5. Dispose of any contaminated clothing properly.
6. Wash your hands with a disinfectant soap.