

## **GUIDELINES FOR DIRECTED STUDY STUDENTS**

Since the Biology and Physics Department laboratories and equipment are shared by the faculty for research and our lab classes, special considerations have to be taken in order to have an equal opportunity to successfully and safely complete your research. All persons using the lab facilities must read and comply with the following policies regarding lab safety, equipment use and lab etiquette.

Remember that you are responsible for:

- Your own health and safety.
- The health and safety of those around you.
- The security and the safe use of equipment and facilities that you have been authorized to use.
- Understanding and complying with all laboratory policies.

Be prepared to work hard and work independently, especially if your project is an ambitious one. Laboratory procedures require patience and techniques that only practice can teach. Long hours of observation may be involved. Things do not always go as expected and they rarely go according to a predetermined schedule. Be sure you have adequate time to do the work and have an alternate plan ready in case you reach one of the infamous dead ends.

With that said, keep in mind that the rewards of a successful project are great. The techniques you will learn are applicable in the many career paths in today's job market. Your project will look great on a resume or graduate school application!

Before beginning any project, it is important to learn as much as possible about the methods you will be using. You don't want to waste your valuable lab time learning something you could have read in a textbook or published paper.

Keep in mind that each project will need a unique set of methods and techniques. A method that works for one project may be the wrong method for your project. You will need to find out more specifics about your application.

Finally, be sure you have what you need to complete this project. We cannot always supply many of the consumable items you will need such as chemicals or microorganisms at the last minute. Most of our supplies are for laboratory classes only and are very limited.

### **Laboratory Policies**

In order to manage risks, it is necessary to limit access to equipment, laboratories, supplies and certain storage areas. The following general policies apply to ALL laboratories within the department.

## Access

Directed Study students will be assigned an area to work in. Other areas are off limits unless given specific permission. You may not enter any other lab, stockroom, storeroom or office unless you have been specifically authorized.

If you are granted access to the laboratory for a particular project, you are permitted to work on only that project and not on an unauthorized project.

Having swipe card or key access does **NOT** mean you are authorized to access a lab. To be authorized, you **MUST** have been trained in the appropriate hazards and control measures by the supervising faculty or laboratory coordinator. Once authorized, you may gain access only to that laboratory for the time you have been approved for.

Where access to a room is restricted, such as by a swipe card or lock, you are **NOT** authorized to allow entry by people who do not have authorization for access to that facility. This means that you are **NOT** allowed to unlock the facility or provide entry for someone else or have friends visiting you in the lab.

In ideal circumstances, work in the labs would be completed during normal working hours. In practice, however, it is sometimes necessary or desirable for staff or students to work on campus at other times. In these circumstances there is an increased risk to health because of the lack of supervision and a lower availability of assistance if someone is incapacitated due to accidental injury or sudden illness. Such risk is greater in certain laboratories or where there are particular hazards. Our goal is to ensure that appropriate measures are taken to minimize risk to the health and safety of staff or students who work on campus in laboratories after hours.

*Prior* to students working after hours in a designated laboratory, they:

- (a) must have completed appropriate training, including emergency evacuation and other necessary emergency procedures;
- (b) must notify their supervising faculty of their intentions;
- (c) must obtain their supervisor's authorization to perform any designated high-risk procedures; (note: approval will not be given for such procedures to be performed by anyone intending to work *alone* ).

Students working after hours in a designated laboratory:

- (d) must not perform any designated high-risk procedures if working *alone*;
- (e) must comply with all normal safety procedures and take any special safety precautions as previously agreed with their supervising faculty and the lab coordinator;

It is best to use the "buddy system" in order to have a second authorized person present in the laboratory to summon help in case of an accident. However, if you are working alone in the lab, it is recommended that you keep your cell phone on your *person* so it is within reach at all times, not in your book bag or on the lab bench.

## Supplies

Directed Study students must make a realistic list of the supplies needed for their project. The list must be discussed with the supervising faculty and the lab coordinator prior to the start of the project so supplies can be ordered.

Write out your calculations before obtaining and mixing chemicals. Don't be shy about asking your faculty supervisor to check your calculations. Keep this information recorded in your experimental lab notebook, reviewing it often.

Materials in the lab are for class use. All material for projects must be purchased using the project's budget, identified as to the project, and separately stored on a space available basis. **The cost of unauthorized use of materials will be directly charged to you.**

Unless given permission, Directed Study students are not allowed to take stock supplies, solutions or media prepared for instructional labs. Do not "borrow" class materials for a special project or project materials for a class. Plan ahead. Even with permission, let someone know when you take supplies. Never take the last of anything without asking first.

Student lab assistants are a great source for information when locating items and making solutions. However, they are there to prep for the lab classes and are not expected to work on your project.

It is a good practice and part of the learning experience to prepare your own media.

You are not permitted to bring materials and/or chemicals into the lab without approval from the lab coordinator.

All materials must be stored in viable, closed containers. These containers must be labeled with the original manufacturer's label, or a reasonable facsimile.

Each and every container used for materials must have the common compound name (no formulas or abbreviations) or the solution content and strength, the users' name, the date, and appropriate hazard information. This policy applies to all containers or glassware whether the material is hazardous or not (i.e. water, buffers, etc.) including solvent waste containers. Each room has a poster explaining proper labeling

The Material Safety Data Sheet (MSDS) must be read for all materials in use. The forms may be obtained in the room where the chemical is found, from web sites or through the lab coordinator. All researchers must have a printed copy of the MSDS on file in the lab for all chemicals being used. Photocopy them if necessary, and keep them in your lab notebook. All the necessary information that you require to carry out your lab work should be kept in the lab and within reach.

## Housekeeping

When you set up your area for experiments, check the fume hoods, lab bench, etc. for space and cleanliness. You want to insure that nothing else is going to interfere with your experiments. If the area requires cleaning, use latex gloves (or other glove types) even if you are using a lab bench cleaner. Better to be safe!

Keep the work area clean and tidy. Keep common work areas clean. When you have finished for the day, make sure all tools, equipment, and supplies are returned to their proper storage, and the equipment is shut down. All glassware must be cleaned before it is put away. Be courteous to your colleagues--CLEAN UP!

All the glassware, containers, bags, that you use are to be properly labeled. Follow the department guidelines. Make sure that you have all the relevant information on your containers (name, dates, etc.). Never store anything without labeling. It will likely be tossed out by the lab coordinator.

Each student is responsible for cleaning all of his/her glassware at the end of each day. It is never acceptable to leave dirty glassware in the sink for someone else to clean. Glassware must be cleaned properly immediately after use to avoid having solutions and compounds dry on the surface. Persons not cleaning their glassware immediately after use will no longer be permitted to use glassware. This rule is strictly enforced.

Arrangements for storage and disposal of hazardous material must be made in advance prior to using the lab. Proper waste disposal is an important part of our lab chemical hygiene program and subject to fines from the state if not handled properly. All waste should be placed in the proper container for the appropriate disposal method and should be properly labeled, then placed in the designated lab hood located in SC351. Please also be sure that the waste bottle is capped AT ALL TIMES unless you are adding waste. Notify the lab coordinator when you have full containers.

Sharps (blades, disposable syringes and syringe needles) must be disposed of in the red sharps containers. Sharps must never be disposed of in the wastepaper baskets for any reason!

Hazardous material spills must be dealt with immediately and appropriately. This includes the proper cleanup of workspaces, glassware and equipment as well as the proper cleanup and disposal of consumables.

All instruments, counter tops, exhaust hoods, tool kits, and work spaces must be left in a clean and operable condition following the completion of work.

All data stored on computers must be backed up and deleted within 48 hours or it will be removed. In all circumstances, data on the computers is stored at the researchers own risk.

Normally, all lights are to be turned off when leaving the lab and all doors checked as locked.

## **Safety**

Research with a variety of biological materials presents potential hazards of exposure that need to be carefully considered. Guidelines for safe use of rDNA, viruses, bacteria, select agents and toxins, blood and human tissue, and other biological materials require that safe practices and procedures be in place to reduce or eliminate these exposure risks. First and foremost, read our Lab Safety Guidelines. It explains the important safety considerations. Also, you need to know the specific risks of the materials you will be working with.

Users must be aware of appropriate emergency procedures *before they are needed*. All users must know the location of telephones, fire extinguishers, eyewash stations, showers, and spill clean-up stations. All users must also know the location of emergency contact information.

The safety of self and others is the personal responsibility of each and every lab user in the Biology labs. Users must constantly be aware of the hazards associated with the chemical and biological materials present throughout the lab and the instrument they are using.

In all circumstances, the use of hazardous materials must be restricted to the exhaust hoods or biological safety cabinets. Users should be aware of the operating principles of the safety hoods.

The appropriate level of protective clothing and eyewear must be worn when using hazardous materials.

You should locate posted information regarding emergency contact information and identify the location of fire extinguishers and eye washes (if appropriate) within the laboratory.

You should review and understand all additional posted access, safety warnings, and safety policies for the laboratory.

All injuries that occur in the laboratory must be reported immediately to the lab coordinator.

If you create a hazard you must control it. It is important to notify and involve a faculty member or the lab coordinator where the hazard is located.

Consumption of food and drink is prohibited in all laboratories.

**APPROVED EYE PROTECTION MUST BE WORN AT ALL TIMES WHILE IN THE LABORATORY**, regardless of whether you are a visitor or you are working on the project. Eye protection includes protective goggles or safety glasses with side shields.

**NO SHORTS, TANK TOPS, SANDALS, OR OPEN OPEN-TOE SHOES ARE ALLOWED.** Long hair must be tied back, long sleeves must be cuffed or rolled up, and loose jewelry secured when working on machinery.

**IT IS YOUR RESPONSIBILITY TO KNOW THE SAFETY REGULATIONS GOVERNING THE OPERATION OF ANY EQUIPMENT PRIOR TO USING SUCH EQUIPMENT.**

Additional safety equipment can be made available to you if necessary. Respirators, masks, specialty gloves, etc. can be obtained from the lab coordinator.

Never, ever walk down the hallway with a chemical or sample that is not securely covered and contained! There may be someone walking around the corner, or rushing out the door running into you, increasing the risk of both of you being injured.

Wear a lab coat. It is available from the KSU bookstore and it's cheap!

Locate the safety shower and the spill kits. Know how to treat spills ahead of time by asking the lab coordinator.

You should follow the safety rules set forth in the *Biology and Physics Department Laboratory Safety Guidelines*

## **Equipment Use**

The laboratories and their equipment must be maintained in manner that allows for clean, safe use by all persons in the KSU science community. Persons operating in a manner that jeopardizes the research and safety of others or in a manner that damages or renders instruments or lab facilities unusable to others may have their lab privileges suspended or revoked.

Respect the rights of others to use the instrument, and honor their reserved times on the instrument.

Conflicts in schedules are best resolved when all parties work in cooperation. Persons refusing to cooperate when asked to do so may have their lab privileges suspended or revoked. **Instructional lab courses have priority in equipment use.**

In all cases, the lab coordinator has final say in instrument scheduling and usage.

In the laboratories, only students qualified and approved to run equipment may do so. Approval is by faculty knowledgeable of equipment operation and safety or the lab coordinator, you are not to “teach” unapproved students how to use equipment. **YOU ARE REQUIRED TO COMPLETE TRAINING ON ANY EQUIPMENT PRIOR TO USE**

If you have any questions regarding the operation of a machine, ask for help from a qualified faculty member or the laboratory coordinator.

Do not attempt to modify or repair any equipment or apparatus unless you have been authorized to do so.

Do not use equipment that is broken, dangerous or malfunctioning. Report all such items to the lab coordinator.

Follow guidelines posted on the walls of the lab and, in some cases, on the individual pieces of equipment.

In order to prevent injury to you and damage the equipment, **DO NOT ATTEMPT TO OVERLOAD THE CAPABILITIES OF THE MACHINERY.**

Electric shock, high temperature, moving parts or magnetic field hazards are associated with some analytical instruments. Users must be aware of the hazards associated with the specific instrument and exercise proper care in the vicinity.

Notify the lab coordinator when maintenance or repairs are required for an instrument.

**The bottom line: Know your instrument, know your materials, and know what to do in an emergency.**

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### **Field Study Guidelines:**

Field studies have their own risks. Streams, lakes, forests, fields, roadsides and other types of places outdoors hold significant risks. Working responsibility for safety in field research rests primarily upon the persons who directly supervise and carry out the research on location. Such persons are expected at all times to use good common sense. The Biology Department’s concern in this policy is to require that due diligence be exercised by all concerned parties in giving attention to the nature of, and the means for dealing with, the risk that may be associated with each location and kind of field research. It is the intention of the Biology Department that participants enter into field research on the basis of their informed understanding of the associated risks and their consent to the means for dealing with such risks.

It is best to use the “buddy system” in order to have a second person present in the field to summon help in case of an accident. However, if you are working in the field, and you are working alone, it is always advisable that you leave your name, telephone number, and the amount of time that you will be in the field, with someone you know, and that is reliable. Your faculty supervisor would be a good person to contact.

If you have a cell phone, take it into the field with you. Keep it on your person at all times if possible.

Check your equipment list before you go out into your study area. If you are packing chemicals for use, make sure that they are securely wrapped, labeled, and packed for easy storage and removal. Bring the appropriate safety equipment when needed.

Know the surrounding area that encompasses your study plot. Find out where phones, police stations, etc. are located, in case of an emergency. Always bring a small backpack-sized first aid kit with you. If you are allergic to stinging insects it's best to obtain a treatment kit from your doctor. You should not take chances especially when you are out in the field and far away from a hospital or clinic. Overall, your faculty supervisor is the most valuable and knowledgeable person in the department who knows and understands your research project. Clarify the protocols and the use of chemicals and equipment with them before starting your research. **Always keep safety in mind. It may save your life!**

When in the field, remember you are a representative of KSU in the community. You should conduct yourself in a responsible and professional manner at all times.

### **Violations and Enforcement**

Faculty, staff and lab assistants will strictly enforce laboratory policies and safe use practices.

Anyone found under the influence of drugs or alcohol or is impaired in such a way as to compromise safety will immediately be asked to leave. Offenders will have their lab privileges revoked for the semester.

Any violation of laboratory policies or witness of an unsafe act can result in the loss of authorized laboratory access.