

Room: Science 236

Section 001	M	8:00AM – 9:50AM
Section 003	M	10:00AM – 11:50AM
Section 005	M	12:00PM – 1:50PM
Section 007	M	2:00PM – 3:50PM
Section 008	T	8:00AM – 9:50AM
Section 009	T	10:00AM – 11:50AM
Section 011	T	12:00PM – 1:50PM
Section 013	W	10:00AM – 11:50AM
Section 015	W	12:00PM – 1:50PM
Section 017	W	2:00PM – 3:50PM

Room: Science 240

Section 006	M	12:00PM – 1:50PM
Section 010	T	10:00AM – 11:50AM

Instructors: Dr. Timothy Mulkey, Coordinator Timothy.Mulkey@indstate.edu, Science 259

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This laboratory is typically taken concurrent with **BIO-112** or **BIO-113**. The lab provides hands-on experiences with the topics, concepts and principles covered in the lecture courses. The lab exercises will introduce you to equipment, techniques, and procedures. You will spend 2 hours in each lab session; this is the national standard for the laboratory section in science non-major's courses.

This syllabus contains the policies and expectations established for BIO 112L. Please read the entire syllabus carefully before continuing in this course. These policies and expectations are intended to create a productive learning atmosphere for all students. Unless you are prepared to abide by these policies and expectations, you risk losing the opportunity to participate further in the course.

This syllabus is a guide and every attempt is made to provide an accurate overview of the course. However, circumstances and events may make it necessary for the instructor to modify the syllabus during the semester and may depend, in part, on the progress, needs, and experiences of the students. Changes to the syllabus will be made with advance notice. In the event of a University-wide emergency, course requirements, classes, deadlines and grading schemes are subject to changes that may include alternative delivery methods, alternative methods of interaction with the instructor, class materials, and/or classmates, a revised attendance policy, and a revised semester calendar and/or grading scheme. Notification of any changes in course requirements and assignments will be distributed via e-mail or posting of changes on the bulletin board outside the laboratory.

Lab Manual: *Explorations of Biological Phenomena, 7th Edition*. 2010. T. Mulkey, R. Ghosh, & W. Brett, ISBN 978-0-7380-4178-0

Foundational Studies Learning Objectives:

1. Engage in laboratory experiences that reinforce and augment the theoretical content of the lecture course.
2. Use the scientific method to formulate and test hypotheses.
3. Use the tools and techniques of biology to gather and analyze data.
4. Present the analysis and findings of the lab experience.

5. Critically read, evaluate information, and obtain knowledge through experimentation to solve problems.
6. Critically analyze and evaluate the ideas of others.
7. Apply knowledge and skills within and across the fundamental ways of knowing (natural sciences, social and behavioral sciences, arts and humanities, mathematics, and history).
8. Demonstrate an understanding of the ethical implications of decisions and actions.
9. Develop students' abilities to express themselves effectively, professionally, and persuasively both orally and in writing.
10. Develop students' abilities to analyze data and think critically.

Lab Preparation: Students are **required** to read the lab exercise handout prior to coming to lab. A quiz over the lab exercise for that period will be given at the beginning of each lab period.

Assignment Due Dates and Times: Unless otherwise stated, lab worksheets are due at the **next** scheduled lab meeting. All lab worksheets will be turned-in **during the first 5 minutes of your lab** section, and at **NO** other time. **Be on-time** to class and **be prepared**. The only acceptable excuses for handing-in an assignment late are listed below.

Attendance: Attendance is **mandatory**. Labs are hands-on experiences. You cannot borrow someone's notes and obtain the same experience. You must attend the lab and fully participate in the lab experiences. You must be on time; **tardiness is not acceptable**. If you have an acceptable excuse for the absence (see below) you should talk with your lab instructor and the lab coordinator to arrange to make-up the laboratory experience. Make-ups are performed by attending a different section of the lab during the **same week** of the **excused** absence; you **must** make arrangement for attending a different lab section through your lab instructor and the lab instructor of the alternate lab section.

Federal financial aid regulations **require** ISU to monitor and report absences; unexcused absences can impact financial aid. Again, attendance is **mandatory**.

Lab Worksheets: Worksheets are provided at the end of each laboratory exercise. The worksheets consist of questions, data tables, drawings and other activities which are relevant to the particular lab exercise. You are required to fill out the worksheets. Your worksheets should reflect **your** work and **not** the work of your lab partner or others in the lab. Do not copy from other student's worksheets; sharing answers will result in sharing a greatly reduced grade on the worksheet. There are 12 worksheets one of which will be due during the first 5 minutes of the lab period of the following lab. Each of these worksheets will be worth 25 points. If you do not turn in your worksheet when required during the first 5 minutes of the lab section, it will **NOT** be accepted. **Do not show up late for class.**

Weekly Lab Quizzes: You are responsible for reading the lab exercise before you come to the next lab session. Knowing what will be done in the lab will help you prepare for the lab experience and will enable you to experience a more productive lab session. To encourage you to read the lab exercise **before** class, you will take a short quiz **during the first 10 minutes of the lab session**. The quiz will cover the material and activities that you will be doing in the lab experience **that day**. Be prepared for the lab and the lab will run more efficiently; if you are not prepared, you will waste time and not be able to complete the required activities for the day.

Grading:

Assignment	Points
Quizzes (10 quizzes; 10 points each)	100 pts
Worksheets (11 lab units; 25 points each)	275 pts
Lab Practicals (midterm & final; 100 points each)	200 pts
TOTAL POINTS	575 pts

Grading Scale:

Letter Grade	Percentage	Points
A+	97 – 100	558 - 575
A	93 – 96	535 - 557
A-	90 – 92	517 - 534
B+	87 – 89	500 - 516
B	83 – 86	477 - 499
B-	80 – 82	460 - 476
C+	77 – 79	443 - 459
C	73 – 76	420 - 442
C-	70 – 72	403 - 419
D+	67 – 69	385 - 402
D	63 – 66	362 - 384
D-	60 – 62	345 - 361
F	0 – 59	0 - 344

Reasonable Accommodation: All reasonable efforts will be made to accommodate students who have disabilities. It is **your responsibility to provide documentation** of your disability and discuss the appropriate accommodation(s) with the lab instructor and lab coordinator during the **first week** of the semester; students are required to contact Student Support Services to provide verification of disability and certification of the accommodations that should be provided by the end of the **second week** of the semester. No students may use dictionaries or electronic translation devices during quizzes or lab practices, without prior permission of the instructor.

American with Disabilities Act Statement: "Indiana State University seeks to provide effective services and accommodation for qualified individuals with documented disabilities. If you need an accommodation because of a documented disability, you are required to register with Disability Support Services at the beginning of the semester. Contact the Director of Student Support Services. The telephone number is 237-2301 and the office is located in Gillum Hall, Room 202A. The Director will ensure that you receive all the additional help that Indiana State offers.

If you will require assistance during an emergency evacuation, notify your instructor immediately. Look for evacuation procedures posted in your classrooms."

Beepers, Pagers, or Cell Phones: All beepers, pagers, and cell phones **must be turned off** or set on vibrate or another silent-alert mode during class. Students should **not** answer these devices during class unless it is a true emergency. Students that disrupt the lab with these devices will be asked to leave for that day and lose 10 points for each offense.

MP3 Players or Other Music/Audio Devices: All music/MP3 players and audio devices, other than prescribed hearing aids, **must be turned off** during class. Students are required to direct their attention to the information provided by their lab instructor and not be distracted by any other devices; this is a SAFETY issue and STRICTLY enforced. Students using these devices during the lab will be asked to leave for that day and lose 10 points for each offense; the student will not receive any credit for any quiz or work to be completed during that lab period.

Laptop Usage: Personal laptops are not required for this course, but their usage is permitted. Laptop/computer access will be provided for any activity in this course when a laptop/computer is required. Use of your personal laptop is generally permitted as long as such usage remains within the bounds of the Code of Student Conduct and it conforms to the provisions of its use as laid out in this syllabus. There may be occasions where laptop usage is forbidden and if that occurs, failure to comply with these directions will be viewed as a violation of the **Code of Student Conduct**. Students should be aware that use of personal electronic devices in the laboratory where liquids, chemicals, and other

activities occur can place personal devices at risk; students are responsible for any risk or damage to personal devices.

Lab Clean Up: It is your responsibility to clean up after yourselves in the lab. You do not want to have to clean up someone else's mess before you can begin an experiment; therefore, provide others the same courtesy and clean up your spills. You do not want to be exposed to someone else's spill of unknown origin; so, clean up your spills. **If you leave a mess, you will lose 10 points for each offense.** It does not matter who makes the mess, please clean it up so that the work environment is better for everyone.

Lab Safety: Laboratory Safety will be discussed during the first lab period. Students are required to sign and return the form which acknowledges that they have read and understand the safety policies to be observed in the lab. If a student violates safety policies and procedures, the student can have points deducted from her/his grade and/or be asked to leave the laboratory for that week. Any work or assignment which the student has not completed for that lab session cannot be made-up and credit cannot be received for the work that was not completed.

Acceptable Excuses for Absence and Late Submission of Assignments:

1. Death
 - Your own early demise is, of course, a valid excuse for not attending lab or turning in your work on time. In this case, **no further documentation is required.**
 - Absence due to death of a very close personal friend or member of your immediate family **requires documentation.**
2. University-Sponsored Activity
 - A University-sponsored activity, field trip, or event is accepted as a valid excuse when documentation is provided. Documentation for any University-sponsored event must be provided at least one week **in advance** of the event. The faculty member who is the official university representative associated with the university-sponsored event is required to **provide official documentation** concerning the event and the absence. Students should consult with their lab instructor prior to the absence to arrange for an alternate lab section **during** the week of the absence to make up the missed lab experience.
 - Scheduling an appointment with another instructor or with your advisor is **not** considered a University-sponsored activity. Such appointments must be made outside of the scheduled course times.
3. True Personal Emergency
 - We all have true personal emergencies. These can be medical emergencies or family emergencies. For example, a ruptured appendix may prevent you from attending class. If such a situation should arise, **please document** it fully; examples of **appropriate documentation** include signed doctor's note that states the exact times, dates, and purpose of the visit, hospital records showing your admission, police reports, or other specific, official documentation which may be appropriate for the specific **emergency.** Notes from your parents or spouses or friends are **not** acceptable. **Dental or doctor appointments should be arranged other than at lab times.**
 - Any medically-related absence **requires documentation** from medical personnel and must contain specific information concerning the medical problem and contact information for verification. The documentation is **required to state that the medical issue is an illness or of an emergency nature;** a routine check-up is not an emergency. Medical information is covered by Federal FERPA and HIPAA regulations and will be kept confidential by the lab instructor.
4. Other Excuses
 - None.

Verifiable documentation is **required** for **all** absences. *Documentation must be presented to the instructor **immediately** upon the student's return to campus or, at the latest, during the **first** class meeting upon return to campus from the absence unless otherwise noted in the above policy; failure to provide documentation **immediately** upon return after an absence can eliminate any opportunity to make-up the missed laboratory experience.* Arrangements for making-up missed assignments will be made by the lab instructor upon verification of the documentation. **No make-up is allowed without documentation.**

Make-up laboratories that do not occur during the week of the original laboratory experience, requires hours of preparation and set up. If possible, students should attempt to contact their lab instructor, provide the required documentation, and arrange to make-up the lab experience by attending a different lab section **during the week of the excused absence**. A list of the times of the lab sections associated with this course is provided at the beginning of this syllabus. To attend a different section of the lab to make-up an excused, documented absence, you should contact your lab instructor for approval. Upon approval, your lab instructor will assist you with contacting the lab instructor of a lab section when the make-up experience can occur. **Both** your lab instructor **and** the instructor of the make-up lab section must agree to any arrangements associated with the make-up lab experience. An arrangement for make-up lab experiences during times other than the week of the lab unit is at the discretion of your lab instructor.

Laboratory Schedule:

Week	Dates	Quiz	Lab Unit
1	January 6 – 10		LABS CANCELED DUE TO WEATHER Last day to add a class (Jan. 13)
2	January 13 – 17		Introduction, Orientation, Lab Safety Solving a Problem (Ex. 1) Last day to drop with No Grade (Jan. 20)
3	January 20 – 24		NO LAB -- University closed for Martin Luther King Jr. Day (Jan. 20)
4	January 27 – 31	X	Introduction to Microscopy (Ex. 2) Three Week Attendance Report submitted (Feb. 1)
5	February 3 – 7	X	Investigating Everyday Phenomena (Ex. 4)
6	February 10 – 14	X	Techniques of Instrumentation for Biological Measurement (Ex. 3)
7	February 17 – 21	X	Nutrition (Ex. 9)
8	Feb. 24 – 28		Lab Practical I
9	March 3 – 7	X	Enzymes – Catalysts of Life (Ex. 8) Midterm Grades report submitted (March 4)
	March 10 – 14		Spring Break Last day to Drop a Course with WP/WF (March 17) Last day to Withdraw from a Course with No Grade (March 17)
10	March 17 – 21	X	Food Production in Green Plants (Ex. 7)
11	March 24 – 28	X	Production of Energy from Molecules -- Respiration (Ex. 6)
12	March 31 – April 4	X	Reception of Stimuli and Response to Stimuli (Ex. 5)
13	April 7 – 11	X	Human Physiological Parameters or “Medical Measurements” (Ex. 10)
14	April 14 – 18	X	Lung Capacity and Effects of Hyperventilation (Ex. 11)
15	April 21 – 25		Lab Practical II Final Grades due in Registrar's office (May 6)

Academic Honesty & Integrity: You should be familiar with the ISU Code of Student Conduct. When you submit work for credit you must do so with honesty and integrity. At a minimum, this means:

1. Any work you submit must be your own work. For lab work, this includes gathering, analyzing, and presenting data. Many procedures and experiments will be conducted with a lab partner; therefore, gathering data in a lab group is acceptable but the analysis and presentation of the data must be your individual effort.
2. You should use only those resources explicitly allowed by the instructor in completing your assignment. It is your responsibility to know which resources are allowed for completion of any particular assignment.
3. You must acknowledge the use of allowed resources. If you use published resources, proper acknowledgement and citation of the resource are required. If other instructors, tutors, other students, or any outside help is utilized, you should list the sources of the help on the worksheet or other assignment.
4. Unless you are given explicit permission, you may not submit work for credit that was completed for a different class. This includes work completed for the same course in a different semester. Learning is about the process, not about the final product; assignments are given to enhance the learning experience and are not given just to earn points for a grade.

Academic Dishonesty: The following actions are considered to be cheating. Again, this is not an all-inclusive list. Students are expected to assess their own actions to insure they demonstrate honesty and integrity.

1. Submitting an exam or any other work, including lab reports, research or literature reports, quizzes, etc. that is copied as a whole or in part from another person's work, or allowing another student to copy from your work are academic dishonesty.
2. Having another person complete an assignment, submit an assignment, take a test or meet any other requirement in a course or you doing so for another student are academic dishonesty.
3. Using written or electronic notes or information from unauthorized sources during an exam or quiz is academic dishonesty.
4. Receiving information about a test or quiz from anyone except the instructor during the exam or quiz, or giving to or allowing another student to obtain information from you during an exam or quiz are academic dishonesty.
5. Receiving information about the contents of an exam or quiz before taking the exam or quiz, or providing information about the contents of an exam or quiz to another student prior to the student taking the same or similar exam or quiz are academic dishonesty.
6. Plagiarizing assignments from any source, including electronic sources, is academic dishonesty.
7. Falsifying or altering laboratory data or copying the results, answers, or analysis of data from another student are academic dishonesty. When you are working in pairs or other designated groups in the lab, you collect and share a primary data set (numerical values or observations obtained by the experimenter or read direction from instrumentation). However, the conclusions, analysis, or answers which are derived from the primary data set should be obtained by your individual effort and not copied or derived from the work of others.
8. Submitting a lab report using data that you did not help collect or sharing data with students who did not help collect the data are academic dishonesty. This does not apply to data provided by the instructor or data which are collected by different groups in a lab to be shared between the groups so that you can analyze a larger, more complete data set.
9. Not noting the source of help in preparing, writing, reviewing, editing, or proofreading an assignment for submission is academic dishonesty. The extent of help which significantly alters the work product must be acknowledged.
10. Use of the whole or substantial parts of any written assignment submitted for credit in any other course without the explicit permission of your instructor is academic dishonesty.

MIDTERM GRADE REPORTING

The midterm grade reporting period is February 27 – March 4 for students who are classified as freshmen, students receiving Ds or Fs or students on academic probation.

MANDATORY 3-WEEK ATTENDANCE REPORTING

Federal Regulations require that attendance be monitored in all courses. ISU has established mandatory reporting of attendance at 3-weeks during the semester.

- 3-Week Reporting – January 27 -31.

REMINDER OF CHANGES IN ISU DROP POLICY.

(THE FOLLOWING POLICIES WERE APPROVED EFFECTIVE FALL 2002)

1. You will receive a grade in any class you drop between the 14th calendar day of the semester and the end of the 10th week of the semester. The grade will be a DP if you are passing at the time of the drop or a DF if you are failing at the time of the drop. The course and grade will be included on your transcript but will not be included in your GPA calculation.
2. You **CANNOT** drop a class after the 10th week of the semester. There will be **no petition for exception** to this policy. If you want to drop a class after the 10th week, you will be required to **drop all classes** (withdraw) from the term. Undergraduate students should contact the Office of Admissions, Erickson Hall, room 114, (812) 237-2121 to withdraw. Graduate students should contact the School of Graduate Studies, Tirey Hall, room 183, (812) 237-3005 to withdraw.
3. If you withdraw after the 10th week of the term, you will receive a grade for each course in which you are enrolled. The grade(s) will be a WP if passing at the time of the withdrawal or a WF if failing at the time of the withdrawal, the course(s) and grade(s) will be included on your transcript. A WF grade will be included in GPA calculation as an F.

DROP GRADING POLICY (Drop is a single course)

January 6 - January 19, 2014 -- No Grade

January 20 - March 16 -- DP or DF (included on transcript)

March 16, 2014 - Last day to drop any course, No petitions for exceptions

NEW GRADE DEFINITIONS

DP - Dropped Passing

DF - Dropped Failing

WP - Withdrew Passing

WF - Withdrew Failing

WITHDRAWAL GRADING POLICY (Withdrawal is all courses)

January 6 - March 16, 2014 -- No Grade

March 17 or later -- WP or WF (included on transcript)

Equal Opportunity Statement: Indiana State University is dedicated to ensuring a positive classroom environment. ISU provides equal educational opportunities for all qualified students and does not discriminate on the basis of sex, disability, race, creed or religion, color, age, national origin or any other unlawful factors in its educational programs, activities, or employment as required by Title VI and Title VII of the Civil Rights Act of 1964, Section 504 of the Rehabilitation Act of 1973, title IX of the Educational Amendments Act of 1972 and the Age discrimination Act of 1978. Any suggestions that would contribute to maintaining a conducive classroom environment should be directed to the instructor.

Acknowledgement of Understanding of Course Requirements for BIO 112L – Explorations of Biological Phenomena

I certify that I:

1. have thoroughly read the course syllabus and its accompanying materials;
2. have asked the instructor to clarify all course and syllabus items that appeared to be unclear;
3. am satisfied that no item in the syllabus regarding course performance expectations remains ambiguous;
4. have given particular attention to the syllabus explanation of attendance expectations and requirements;
5. understand that no work can be made-up without timely, verifiable, documentation concerning any absence;
6. understand that documentation concerning university-sponsored events must be presented to the instructor at least one week prior to the university-recognized event; and
7. understand that documentation concerning my absence due to illness or emergency is due immediately upon return to campus after the absence.

I promise to:

1. abide by the guidelines and policies stated in the course syllabus;
2. refrain from requesting an exception to the syllabus guidelines based on anything that is under my control (e.g., requesting to take a practical early to leave on personal vacation or making-up a lab experience because I over-slept); and
3. forfeit any claim for an excused absence or any opportunity to make-up work if I fail to provide the required verifiable documentation concerning any absence within the guidelines contained in the course syllabus.

Signature _____

Print Name _____

ID Number _____

Date of Signature _____

Credit for any course assignment requires submitting this signed agreement to the lab instructor by the end of the second week of classes. Failure to sign and return this form will result in no grade for any assignment or for the course.

Laboratory Safety Policies & Procedures

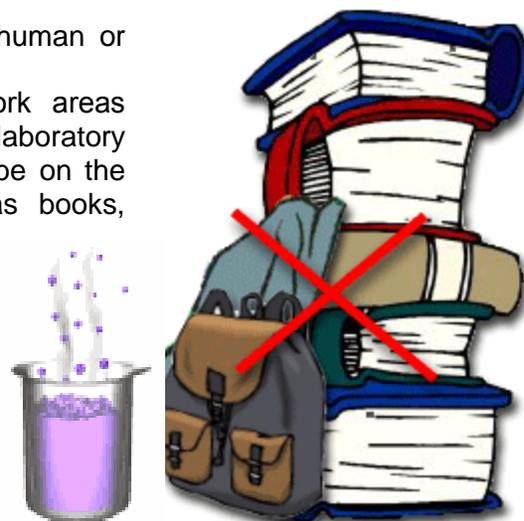
Biology is a hands-on science. You will be conducting many experiments which require the use of chemicals and other materials that can be hazardous if not handled properly.

Proper laboratory technique is essential to the education and success of every scientist. The quality of your work will be judged by the techniques which you demonstrate in the laboratory. The following provides basic safety and procedural policies designed to guide you in protecting yourself and others from injury in the laboratory and to provide a safe and productive work environment.



General Guidelines:

1. Conduct yourself in a responsible manner at all times in the laboratory.
2. Be familiar with the lab unit **before** you come to lab. Follow all written and verbal instructions. If you do not understand the directions or procedures, **ask** the instructor before proceeding.
3. **Do not** eat food, drink beverages, chew gum, or insert contact lenses in the laboratory. Do not use laboratory glassware as containers for food or beverages.
4. Safety goggles and lab coats/aprons must be worn whenever it is appropriate. You should not wear open toe shoes or sandals in the lab. You should wear clothing that provides maximum protection.
5. Gloves should be worn whenever you use chemical that cause skin irritations or you will be handling hot equipment.
6. Gloves should be worn whenever you handle human or animal tissues or fluids.
7. Observe good "housekeeping" practices. Work areas should be kept clean and tidy. Only your laboratory instructions, worksheets, and/or reports should be on the laboratory benches. Other materials such as books, backpacks, cell phones, coats, purses, etc. **must** be stored in the designated area.
8. Know the locations and operating procedures of all safety equipment. Know the location of the first aid kit, eyewash station, safety shower, spill kit, fire extinguisher, fire alarm, and phone.
9. **Be alert** and proceed with caution at all times in the laboratory. You should notify the instructor immediately of any unsafe conditions you observe.
10. Dispose of all chemical waste properly. Only chemicals designated by the instructor should be disposed of in the sink, and never mix chemicals when disposing them in the sink. Solid chemicals, metals, matches, filter paper, and other insoluble materials should be disposed of in the proper waste containers.
11. All glass should be disposed of in the container designated for disposal of "Glass Waste". If you break any type of glassware, take care of yourself first, then **CLEAN UP** the broken glass to prevent others from cutting themselves. A broom and dustpan are located in each laboratory. All broken glass is deposited in the blue and white broken glass box in the lab.
12. All sharp objects should be disposed of in the container designated for disposal of "Sharps". Sharps are disposed of in a separate box from glass or other hazardous



material. This box is red plastic and labeled for “Sharps” disposal. It is usually located near the broken glass box in the lab.

13. All biological wastes should be disposed of in the contained designated for disposal of “Biological Wastes.”
14. Keep hands away from your face, eyes, mouth, and body whenever you are in the lab. Wash your hands with soap and water after performing all experiments. Wash, rinse, and dry all work surfaces and equipment at the end of the experiment.
15. If you spill acid or any other corrosive chemical on your skin or clothes immediately wash the area with large amounts of water. Inform the instructor of the incident. The spill kit will be used for spills on the floor, counter-tops or other surfaces.
16. At the end of the laboratory session you are responsible for turning off any equipment that was used during the lab period, insuring that the desk top, floor area, and sink are clean, and all equipment, that was heated during the lab, cool, clean, and in the same condition as you found it at the beginning of the lab period.
17. The safety regulations for working in a lab include **no** eating, **no** drinking, and **no** smoking at any time. Any food or beverages must be kept outside of the door of the laboratory. Please **DO NOT** discard any food or beverage items in the trash cans found in the laboratory. These standards protect you from ingesting a hazardous substance.



Clothing:

1. Goggles are protective eyewear. Eyewear can also include eyeglasses, but it is **recommended** that you wear goggles over eyeglasses to protect your eyes in case of splash accidents. You are **required** to wear protective goggles when working in the laboratory for certain experiments. Eyewear protects against contamination from substances that injure or infect the eyeball and can result in vision loss. Goggles also protect against absorption of materials into the body via the eyeball. **Contact lens wearers BEWARE.** Contact lenses make it difficult to wash away substances accidentally introduced to the eye. They can also be ruined by chemicals and vapors. Contact lenses should not be worn in the laboratory.
2. If any substance is introduced into your eyes **IMMEDIATELY** get assistance and go to the eyewash station which is located in the prep room of every laboratory. Holding your eyes open, flush for at least 15 minutes. Get medical attention as soon as possible. You will be instructed on how to use the emergency eyewash station in the introduction to your lab class. There are also instructions posted next to the eyewash station. If it is not covered in class, request your lab instructor to do so.
3. Dress properly while in the lab. Long hair, dangling jewelry, and loose or baggy clothing are a hazard in the laboratory. Long hair must be tied back and dangling jewelry and loose or baddy clothing must be secured.
4. Shoes must completely cover the foot. Open toed shoes or sandals should **not** be worn in the lab.
5. You should wear a lab coat or apron when working with a variety of different chemicals and solutions so knowledge of when to wear it is fundamental. This will protect you against direct contact with or **residual contamination** from the substance. Before

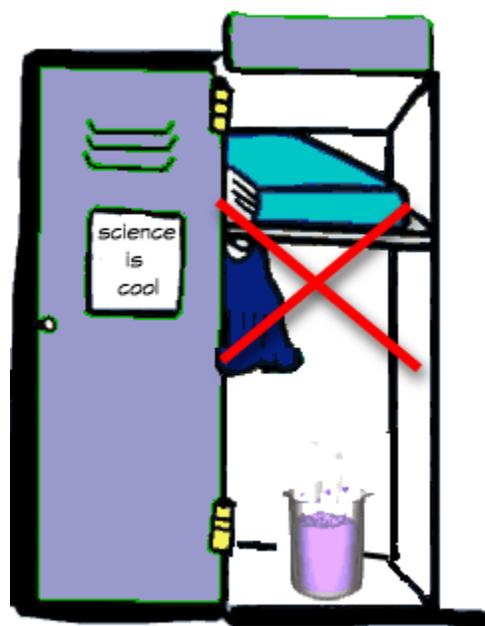


leaving the lab, always remove your lab coat or apron to prevent transfer of a substance outside of the laboratory.

6. If you get a hazardous substance on your hands or arms flush with cold water, over the sink, for 15 minutes. If there is a large amount of a substance spilled on you, IMMEDIATELY get assistance, remove any contaminated clothing, and use the emergency eyewash as a shower. Rinse yourself for at least 15 minutes. Get medical attention as soon as possible.
7. Gloves are made out of latex, nitrile, or other forms of non-latex rubber. They fit skin-tight to allow free movement and dexterity of fingers. It is **recommended** that you wear gloves whenever working in the laboratory, but it is **required** that you wear gloves when working with hazardous materials. Most of the gloves in the department are powder-free, vinyl gloves that are hypoallergenic. If you know you have a latex allergy, pay close attention to the type of glove you use. Gloves are often directly involved with safety because hands are most directly involved with chemicals and solutions.

Handling Chemicals:

1. All chemicals in the laboratory are to be considered dangerous. Do not touch, taste, or smell any chemical unless specifically instructed to do so. The proper technique for smelling chemical fumes (when instructed to do so by the instructor) is to gently fan the air above the chemical toward your face. Breathe normally.
2. Cleanliness important. When working in the laboratory it is important to keep yourself and your work area clean to avoid accidents and residual contamination. Clear your workspace, leaving only what you need to complete your experiment. Keeping the clutter down will reduce the chance of spills and breakage of equipment. You may unknowingly come in contact with a chemical or evaporated solution on counter-tops or other surfaces, or put someone else in danger of contamination. If there is a residual chemical or solution on your hands, you will be in danger of ingesting or introducing the material into your body by other means (eyes or mucous membranes). You must ALWAYS thoroughly wash and scrub your hands before you leave the laboratory. There are sinks with liquid hand soap and paper towels in every laboratory. Wash your hands, dry them with a paper towel and then turn the faucet off using the paper towel to avoid re-contaminating your hands.
3. Check the label on chemical bottles twice before removing any of the contents. Take only as much chemical as you need. Smaller amounts often work better than larger amounts. Label all containers holding any chemicals or solutions.
4. **Never return unused chemicals to their original containers.**
5. Always open chemical and solution bottles with the mouth of the bottle aimed away from your body and others.
6. Replace covers after using the reagent to prevent spills and evaporation.
7. Never use mouth suction to fill a pipette. Use a pipette bulb or pipette filler.
8. Acids must be handled with extreme care. **ALWAYS ADD ACID SLOWLY TO WATER**, with slow stirring and swirling, being careful of the heat produced, particularly with sulfuric acid.
9. Handle flammable hazardous liquids over a pan to contain spills. Never dispense flammable liquids anywhere near an open flame or source of heat.
10. Never take chemicals or other materials from the laboratory area.



- Some of the chemicals you will be working with will require proper disposal. Follow all directions provided by your instructor. Any bottle labeled as hazardous waste should always be in **secondary containment** and have a secure screw-cap cover.
- Always replace the cover when you have finished disposing of your waste, even if someone is waiting to use the bottle. If you are not absolutely sure of the proper disposal methods first look around the lab for a container labeled with the **Hazardous Waste** label and read what its contents are. If you are unable to find a waste container, ask your instructor. Never pour anything down the drain if you are of a solution's hazardous waste status.
- Take great care when transferring acids and other chemicals from one part of the laboratory to another. Hold them securely and in the method demonstrated by the instructor.
- Many chemicals can enter your body by **absorption** through the skin and mucous membranes by **inhalation**; **ingestion** and **contact** with your eyes. You will utilize such chemicals in your laboratory experiences and need to know what your risks of exposure are. You must pay attention to your instructor's directions, warnings from your lab protocol, and hazard codes on the chemical's labels. Be sure to use all of the protective equipment required. Some of the hazardous effects of chemicals found in the laboratory include strong **irritants**, **toxins**, **carcinogens** and **allergens**. The following table highlights some of these chemicals, but there are also many others that you should be aware of in the laboratory.

CHEMICAL	TARGET ORGANS	HAZARDOUS EFFECTS
Acid and Alkaline solutions e.g. Hydrochloric Acid Sodium Hydroxide	Skin, membranes of eye, nose, throat, trachea, bronchi, and alveoli	Etches Tissue - sometimes leading to irreversible damage to tissue
Aliphatic Halogenated Hydrocarbons e.g. Chloroform	Liver and Kidneys	Necrotic cell death-- Redness, swelling, inflammation; CNS effects; PAIN!
Metals e.g. Lead and Silver	Bones	Sequestered for extended periods of time-- Long term toxic effects - enzyme inhibition
Amines e.g. Diphenylamine	Toxic to all tissues and adversely affect a number of organs	Strong irritant, corrosive, and carcinogenic
Amides e.g. Formamide	Central Nervous System, liver, kidneys	Very toxic-- Liver and Kidney toxicity CNS depression
Aldehydes e.g. Formaldehyde	Skin, eyes, mucous membranes	Severe irritant at just a few ppm as well as a strong sensitizer leading to-- Skin rashes, Puffy eyes, Headaches, Respiratory problems. Allergenic properties are worse than its potential carcinogenic properties.

Handling Glassware and Equipment:

- Inserting and removing glass tubing from rubber stoppers can be dangerous. Always lubricate glassware (tubing, thistle tubes, thermometers, etc.) before attempting to insert it in a stopper. Always protect your hands with towels or cotton gloves when inserting glass tubing into, or removing it from, a rubber stopper. If a piece of glassware becomes "frozen" in a stopper, take it to your instructor for removal.



- When removing an electrical plug from its socket, grasp the plug, not the electrical cord. Hands must be completely dry before touching an electrical switch, plug, or outlet.
- Examine glassware before each use. Never use chipped or cracked glassware. Never use dirty glassware. **Do not immerse hot glassware in cold water; it may shatter.**
- Report damaged electrical equipment immediately. Look for things such as frayed cords, exposed wires, and loose connections. Do not use damaged electrical equipment.
- If you do not understand how to use a piece of equipment, ask the instructor for help.

Sharp Objects and Broken Glass:

- Pointed dissection probes, scalpels, razor blades, scissors, and microtome knives must be used with great care, and placed in a safe position when not in use.
- Containers designated for the disposal of Sharps (scalpel blades, razor blades, needles; dissection pins, etc.) and containers designated for broken glass are present in each laboratory. Never dispose of any sharp object in the regular trash containers.
- Report all cuts, no matter how minor, to the instructor. Students with moderate to extensive bleeding will be referred to the Office of Public Safety (extension 5555)
- All biology labs and the biology preparation room house a first aid kit containing antiseptics, bandages, Band-Aids and gloves to care for minor cuts.
- Do not touch broken glass with bare hands. Put on gloves and use a broom and dustpan to clean up glass. Dispose of ALL broken glass in the specific container marked for glass. Do not place broken glass in the regular trash container.
- When cutting with a scalpel or other sharp instrument, forceps may be used to help hold the specimen. **Never** use fingers to hold a part of the specimen while cutting.
- Scalpels and other sharp instruments are only to be used to make cuts in or on the specimen, never as a probe or a pointer.



Heating Substances:

- SHOULD THE BUNSEN BURNER GO OUT, IMMEDIATELY TURN OFF THE GAS AT THE GAS OUTLET VALVE.** If you wish to turn off the burner, do so by turning off the gas at the gas outlet valve first, then close the needle valve and barrel.
- Never reach over an exposed flame.
- Light gas burners only as directed by the instructor.
- Never leave a lit burner unattended. Never leave anything unattended that is being heated or is visibly reacting.
- Always turn the burner or hot plate off when not in use.
- You will be instructed in the proper method of heating and boiling liquids in test tubes or beakers. Do not point the open end of a test tube being heated at yourself or anyone else.
- Heated metals, glass, and ceramics remain very hot for a long time. **They should be set aside to cool on a trivet** and then picked up with caution; use tongs or heat-protective gloves if necessary. Determine if an object is hot by bringing the back of your hand close to it prior to grasping it.



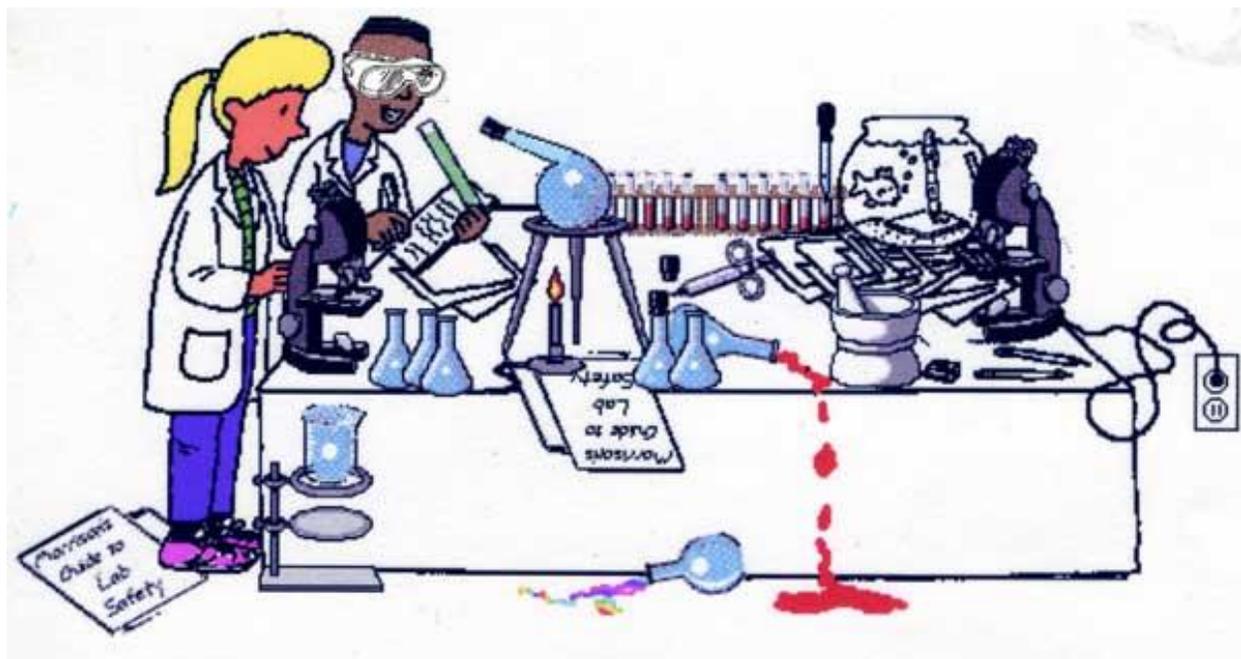
Handling Biological Materials:

- Special precautions are to be followed in all laboratories using any body fluids, such as blood, saliva, and urine, because of the potential to transmit disease-causing organisms.

2. **Follow all instructions carefully.**
3. Use gloves and goggles in all laboratory experiments that involve the use of any body fluids.
4. All contaminated material, such as slides, cover slips, toothpicks, lancets, alcohol swabs, etc., must be placed in a biohazard bag for proper disposal and should never be reused.
5. No samples of body fluids are to be brought into the laboratory from outside sources.
6. All biological materials should be handled as if they are infectious or pathogenic material.
7. Always wash your hands before leaving the laboratory.
8. If a bacterial or fungal sample spill occurs, you should immediately pour a disinfectant, 5% Lysol ®, over the spill and let it disinfect for approximately ten minutes. Then, using gloves wipe up the spill with paper towels and throw them in the Biohazard bag.
9. For large spills, follow with covering the spill area with 20% bleach; allow disinfecting for approximately ten minutes, and then, using gloves wipe the area completely dry. Throw any contaminated articles into the Biohazard.
10. Gloves (latex and non-latex) are provided to handle preserved specimens.
11. When larger specimens are being dissected, the part of the specimen that is not being dissected should be kept enclosed in the plastic bag.
12. When dissecting smaller specimens, seal the bag after removing the specimen, so as to confine the preservative in the specimen bag.
13. Notify the instructor if there is a spill of preservative or any other biological material.
14. Body parts or scraps of the specimen are NOT to be disposed of in the sink.
15. Dispose of dissecting pins or other sharp objects in the red sharps containers, NOT in the regular trash.
16. Specimens are to be clearly labeled and stored in designated containers or cabinets when not in use.
17. Follow the directions of the instructor concerning the proper disposal of preserved specimens after class use is completed.

Microscope Handling:

1. Microscopes must be carried upright, with one hand supporting the arm of the microscope and the other hand supporting the base. Nothing else should be carried at the same time.
2. Microscope must be positioned safely on the table, NOT near the edge.
3. After plugging the microscope into the electrical outlet, the cord should be draped carefully up onto the table and never allowed to dangle dangerously to the floor.
4. The coarse adjustment must NEVER be used to focus a specimen when the 40x or oil immersion lens is in place.
5. When finished with the microscope, the cord should be carefully wrapped around the microscope before returning it to the cabinet.
6. The microscope must be placed upright and in the appropriate numbered slot in the cabinet.
7. All prepared microscope glass slides are to be returned to their appropriate slide trays; wet mount preparations are to be disposed of properly.
8. Malfunctioning microscopes should be reported to the instructor.



Do Not:

- eat or drink in the lab
- taste any chemicals or substances with which you are working
- use your mouth for pipetting substances
- handle broken glass with bare hands
- pour chemicals down the drain without permission
- operate lab equipment without permission
- perform your own experiments unless given permission
- leave any heated materials unattended
- place flammable substances near heat
- engage in childish antics such as horseplay or pranks

Laboratory Safety Agreement

I am enrolled in: **BIO112L – Exploration of Biological Phenomena**

My laboratory section is: _____ for _____(semester/term).

I have carefully read and understand the **Laboratory Safety Policies & Procedures**. I agree to adhere to these guidelines, and realize that it is my responsibility to do so, for my safety and the safety of all others.

Print name: _____

Date: _____

Signature: _____

Laboratory Safety Policies & Procedures are distributed during the first day of class to each student. The Laboratory Safety Agreement must be signed and returned to the instructor. It is the instructor's responsibility to make sure that each student in the class has signed the laboratory safety agreement.