

# Chemical Hygiene Plan for Athens State - Athens Locations

Athens State University, 2023

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## 1. Introduction

The Athens State Community is committed to keeping its students, employees, and guests safe. The protocol standards set in this document follow state, city and county guidelines and regulations for implementing a safe Chemical Hygiene Plan.

This Chemical Hygiene Plan (CHP) sets the expected procedures, equipment, and practices to be used at Athens State to maintain the safety of its students, employees, and guests and provide guidelines in the event of an emergency. All students, employees, and guests working or learning in the laboratories are required to follow these procedures. This document uses the following definitions:

**Laboratory Personnel:** Any person hired by the university as an employee, student currently enrolled in the university, volunteer, or guest who has permission to be in a laboratory for school purposes.

**Laboratory Setting:** Location where there is interaction with non-production scale, and small quantities of hazardous chemicals.

**Hazard:** Object, situation, or behavior that can cause harm.

**Risk:** Chance that a hazard will cause harm.

**Hazardous Chemical:** Chemical that can cause a physical or health hazard, including carcinogens, teratogens, toxins, flammables, reactives, contact and aspiration irritants, pressurized gases, corrosives, explosives, and oxidizers

Biohazard: Hazardous chemicals and infectious agents that pose a hazard to human health or the environment.

The Chemical Hygiene Plan will be available for reviewing upon request to all employees. This plan will be reviewed annually and copies will be located in digital format in the online Policy Library under Health and Safety within the Administrative Policies and hard copy format in the individual laboratories.

Modification of this CHP must include consultation of a Subject Matter Expert (SME) in the appropriate field, as relevant to the text of the document. A SME must have at least a Bachelor's in Chemistry, Biology, or Health and Safety. For example, a Chemistry SME must be consulted before modifying the Reactive Chemical SOP.

## 2. Roles and Responsibilities

The Laboratory environment includes specific risks and hazards that must be respected in order to maintain a healthy campus. As such, the safety of our university is a community-wide responsibility, from the highest administrative level to the individual personnel. This document assigns specific responsibilities to the roles best positioned to perform them.

All laboratory personnel have the right to be informed of potential health hazards in their work area, the right to be properly trained to safely work with these substances, and the right to file a complaint with the Lab Safety Coordinator (LSC) if they feel their working conditions are unsafe or unhealthy.

### 2.1. University President

The University President is ultimately responsible for the health and safety of all employees, students, and guests. As such, the University President shall ensure compliance with federal, state, and local guidelines, as well as the provisions set forth within this document.

### 2.2. Vice President for Financial Affairs

The Vice President for Financial Affairs is responsible, through the budgetary process, for providing the support and funding necessary to ensure the CHP can be implemented and maintained. This includes ensuring that all employees and guests comply with the CHP.

### 2.3. Provost and Vice President for Academic Affairs

The Provost and Vice President for Academic Affairs is responsible for providing the Chemical Hygiene Officer with the support needed to ensure the CHP is implemented and maintained. This includes ensuring that all employees and guests comply with the CHP.

### 2.4. Registrar

The Registrar is responsible for providing the Chemical Hygiene Officer with the support needed to ensure the CHP can be implemented and maintained. This includes ensuring that all instructors are CHP trained prior to assigning them to teach in laboratory settings.

### 2.5. Dean of the College of Arts and Sciences (COAS)

The Dean of the COAS is responsible for providing the Chemical Hygiene Officer with the support needed within the scope of the college to ensure the CHP is implemented and maintained. This includes enforcing compliance of guests and employees within the college with following the CHP. The Dean will be responsible for ensuring a complete list of CHP trained personnel and individuals able to provide CHP training is maintained and available to the Office of Campus Security and the Registrar.

### 2.6. Chair of the Math, Computer, and Natural Sciences Department (MCNS)

The MCNS Department Chair is responsible for providing the Chemical Hygiene Officer with the support needed within the scope of the department to ensure the CHP is implemented and maintained. This includes ensuring that all guests and employees within the department comply with the CHP, receive CHP training before being allowed to work or instruct in a laboratory setting, are provided refresher trainings as outlined in the CHP, and are provided appropriate safety equipment in the laboratory setting as outlined in the CHP. In addition, the department chair is responsible for ensuring all students enrolled in laboratory courses have a signed acknowledgment form on file.

### 2.7. Chemical Hygiene Officer (CHO)

The CHO shall have sufficient training and experience to evaluate, implement, and update the Chemical Hygiene Plan, give CHP trainings, and be provided sufficient time, authority, and resources to conduct required tasks. These roles and responsibilities include:

- Knowing the current legal requirements concerning regulated substances, both in handling/disposal of reagents/chemicals and adopting/following the requirements of relevant governing bodies, including the Alabama Department of Environmental Management (ADEM) and the Environmental Protection Agency (EPA). Relevant yearly trainings may include HAZWoper, HAZcom, and OSHA, or their equivalents, as necessary.
- Implementing or enforcing implementation of the Chemical Hygiene Plan.
- Develop, update, and perform review of the CHP to maintain currency.
- Relay health and safety requirements to laboratory personnel and responsible parties as needed.
- Conduct periodic lab inspections for potential risks and hazards and take steps to minimize risks and reduce hazards where possible.
- Ensure that the laboratory settings follow all national, state, and local safety regulations.
- Maintain employee exposure records.
- Submit yearly lab inspections to the Provost and Vice President for Academic Affairs as well as report violations that require interdepartmental cooperation to solve.

- Provide CHP safety training to new laboratory personnel and make the list of CHP trained individuals, including instructors completing the Instructor Safety Form (Appendix K), available to the Dean of the College of Arts and Sciences (COAS).

### 2.8. Laboratory Safety Coordinator (LSC)

The Laboratory Safety Coordinator has responsibility for chemical hygiene in the lab, including the responsibility to perform the following:

- Developing and implementing a schedule for regular formal housekeeping inspections of the laboratory facilities, including inspections of emergency equipment.
- Providing an updated list of CHP trained laboratory personnel to the Dean.
- Inspecting and maintaining laboratory equipment so that it remains safe and functional.
- Ordering common stock chemicals, common PPE, common cleaning supplies, and common safety equipment.
- Working with instructors to ensure each lesson plan is in accordance with the Chemical Hygiene Plan and that lesson plans requiring hazardous substances include safe work practices developed using the Chemical Hazards Preparation Form.
- Selecting gloves that are resistant to the chemicals and include them in the inventory.
- Obtaining Safety Data Sheets (SDSs) for new chemicals and maintain them for current chemicals.
- Dating and removing SDSs for chemicals no longer in use in stock room. Archive these SDS for 30 years.
- Maintaining an ongoing inventory of all chemicals in Waters Hall.
- Storing signed student Lab and Field Safety Forms and making them available to the Chair and others as needed.
- Inspecting chemical storage areas annually for outdated chemical stock and deteriorated, leaking, or broken containers.
- Retiring equipment that is broken or no longer fit for purpose to prevent accidents.
- Developing and following sound chemical hygiene habits.
- Posting and making available contact information in the event of an emergency.

### 2.9. Natural Sciences (NS) Professors

Natural Sciences Professors will be assigned responsibility for their laboratory setting. NS Professors are responsible for ensuring laboratory personnel within their assigned laboratory operate according to the CHP guidelines described within this document. As a failsafe, the CHO will be kept up to date on all laboratory operations in order to assist emergency personnel in the event the assigned Professor is not available and vice versa. Responsibilities include:

- Completing CHP training.
- Ensuring all students and guests have signed the appropriate release forms or completed the appropriate CHP training prior to working in their assigned laboratory.

- Evaluating the risks and hazards associated with new materials introduced into the laboratory and substituting a safer alternative if appropriate.
- Informing the LSC or other appropriate authorities if a person is found using the Laboratory Settings without completing CHP training.
- Work with the LSC/CHO to minimize risks and hazardous materials.

#### 2.10. Instructors

All instructors, including adjunct and guest instructors, who work in the laboratory setting must complete the appropriate CHP training, including the Instructor Safety Form (Appendix K) or appropriate release forms, prior to working in their assigned laboratory. Adjunct instructors are responsible for collecting the appropriate signed release forms for any students registered for their lab section and submitting the completed forms to the LSC. All instructors are responsible for ensuring students in their classroom follow CHP guidelines to maintain a safe and clean environment.

#### 2.11. Student Lab Workers

Student Lab Workers must complete the appropriate CHP training prior to working in their assigned laboratory. They are responsible for following CHP guidelines and helping to maintain a safe and clean environment.

#### 2.12. Facilities Personnel

Facilities personnel, to include general housekeeping, are expected to follow posted safety rules and wear appropriate PPE, including long pants and closed toe shoes. To protect their safety and the general safety of the laboratory, equipment, and chemicals should not be moved, altered, or cleaned without notifying a lab personnel.

#### 2.13. Campus Security

Campus Security are first responders in emergency situations, including Major Spill instances. They are responsible for keeping current contact information for CHP trained laboratory personnel as maintained by the Dean of Arts and Sciences.

#### 2.14. Guests

All guests, including students, researchers, and others, working in the laboratory setting must complete the appropriate CHP training prior to working in their assigned laboratory or sign the appropriate release forms. They are responsible for following CHP guidelines and helping to maintain a safe and clean environment.

### 3. General Guidelines for Working in a Laboratory

As with any job site, it is important to maintain safety by respecting hazards and reducing risks. In the lab setting, hazards can include, but are not limited to, heat and open flame, hazardous chemicals, infectious agents, sharp objects, trip and slip hazards, and other physical hazards.



Prior to and while working in the lab, it is important to identify the risk of each hazard and minimize the chance that hazards will cause injury.

It is essential to minimize chemical exposure to the greatest extent possible. There are few laboratory chemicals without hazards, therefore precautions for handling all chemicals shall be exercised. As a general rule, skin contact with chemicals should be avoided.

Avoid an underestimation of risk. Exposure to laboratory chemicals shall be minimized, even for substances of no known significant hazard. Special precautions shall be taken for substances with special hazard risks. One shall assume that any mixture of substances would be more toxic than either of its single components alone. One shall also assume that all substances of unknown toxicity are toxic.

Adequate ventilation must be provided. The best way to prevent exposure to hazardous substances is to prevent their escape into the atmosphere. This is done by use of fume hoods and other ventilation controls. Containers of volatile chemicals shall be capped before and after contents are accessed.

Outdated chemical stock and deteriorated, leaking, or broken containers shall be brought to the attention of the LSC and disposed of properly. All chemical substances that have the potential to become unstable with age shall be disposed at the end of each academic year, regardless of the quantity of each substance in inventory.

### 3.1. Laboratory Conduct: Working in the Presence of Hazards

It is the responsibility of every individual who works, teaches, or learns in a laboratory, as well as the individuals that supervise those individuals, to Identify and Reduce Hazards, Assess and Reduce Risks, and Plan for Emergencies. When working in a laboratory, following the guidelines in this section reduce equipment breakage, injury, and death.

#### 3.1.1. Identify and Reduce Hazards

- Read Safety Data Sheets (SDS), labels, and Standard Operating Procedures (SOPs) for all chemicals prior to procurement, use, and disposal.
- Inspect facilities and equipment for obvious obstructions and damage prior to and during use.
- Eliminate hazards where possible.

#### 3.1.2. Assess and Reduce Risks

- Ensure adequate ventilation / appropriate location.
- Select appropriate Personal Protective Equipment (PPE)
- Substitute less hazardous substances where possible.
- Use smaller quantities of hazardous materials where possible.

- Diluted substances shall be used wherever possible instead of concentrates.
- Select appropriate tools and containers.
- Do not use damaged equipment or glassware.
- Dispose of waste properly.
- Analyze accidents to prevent repeat incidents.

### 3.1.3. Plan for Emergencies

- Notify another trained laboratory personnel prior to proceeding with a protocol involving extremely hazardous or high-risk elements.
- Each procedure with hazardous chemicals shall include a plan of action in case of an emergency.
- Identify all exits.
- Locate all eyewash stations and showers and ensure the path to access them is clear.
- Report all accidents, injuries, or near misses to a professor, the LSC, or the CHO.
- Report all accidents and injuries to Campus Security, as noted in Appendix E.
- Verify that the following information is posted: current emergency phone numbers, evacuation routes, designated meeting place outside the building, and designated person to authorize the re-entry into the building.
- Laboratory operations involving hazardous chemicals that are carried out continuously or overnight shall be designed to prevent the release of hazardous substances in the event of an accident or interruptions in utility services. Classroom lights shall be left on and appropriate signs posted identifying the hazards of the chemicals and phone number of the instructor responsible for the operation.

## 4. Training

Appropriate training for all individuals working in and directly supervising laboratory personnel is essential to maintain the well-being of the campus community.

### 4.1. Who must Receive CHP Training

- Laboratory Personnel, including, but not limited to, professors, instructors, and student workers
- Deans of colleges who operate laboratories and supervise laboratory personnel.
- Chairs of departments who operate laboratories and supervise laboratory personnel.

- Facilities personnel whose roles include the supervision of maintenance and maintenance of laboratories.
- Campus Security Officers

#### 4.2. Who may Provide CHP Training

The CHO shall develop and administer an official CHP training program. Individuals other than the CHO who are designated to administer CHP training shall be kept on file in the office of the Dean of the COAS.

#### 4.3. Overview of CHP Training

Upon initial assignment, employees will be trained concerning relevant chemicals, appropriate procedures, CHP location, SDS location(s), and methods of hazard identification.

Each year following, CHP trained employees will complete a CHP refresher course.

Information and training shall include the following but not be limited to:

##### A. The Chemical Hygiene Plan

- The contents of this standard and its appendices, which shall be made available to employees.
- The location, availability, and contents of the Chemical Hygiene Plan.
- How to properly address accidents or incidents as provided by the CHP.

##### B. Understanding Potential Hazards

- Reading Hazard Communication Standard (HCS)
- The location and availability of known reference material on the hazards, safe handling, storage, and disposal of hazardous chemicals found in the laboratory, including, but not limited to, SDS sheets.
- Chemical inventory requirements, proper handling, and storage.

##### C. Recognition of Chemical Exposure

- The physical and health hazards of chemicals in the work area.
- Signs and symptoms associated with exposures to hazardous chemicals used in the laboratory.
- Methods and observations which may be used to detect the presence or release of a hazardous chemical. I.e., monitoring conducted by continuous monitoring devices, assessing visual appearance or odor of hazardous chemicals when being released, etc.

##### D. Safe Work Practices

- The measures employees can take to protect themselves from these hazards. This includes specific procedures the CHP has implemented to protect employees from

exposure to hazardous chemicals, such as appropriate work practices, emergency procedures, and personal protective equipment.

#### 4.4. Safety Training for Students in Natural Science Laboratory Classes

Each student will sign and date the appropriate Safety Form (Appendices A, B or D), indicating their understanding of the basic rules of laboratory safety and conduct on the first day of class each semester.

#### 4.5. Safety Training for Guests in Natural Science Laboratories

Each guest will sign a Release Form (Appendix C) indicating their understanding of the basic rules of laboratory safety and conduct.

#### 4.6. Training Required for Administrating EPIPEN

Professors holding class in the field must be trained prior to carrying an EPIPEN into the field for use on persons other than themselves. Training will be through the Alabama Public Health and training will be renewed every other year. Pen expiration must be checked every six (6) months.

## 5. Emergency Plan

The Athens State Emergency Response Plan can be found in the policy library under Administrative Policies. In addition, emergency and safety guidelines are posted at laboratory exits.

In the event of a life-threatening emergency, call 911.

For major chemical spills, fire, and other emergencies, alert the Athens State University Security Office (256)-233-8222, or dial 222 from any campus phone, and follow the Athens State Emergency Response Plan. Specific emergency response guidelines for different chemical characteristic can be found in the SOPs (See Section 12).

## 6. Facility Equipment and Maintenance

### 6.1. Housekeeping

Formal housekeeping and inspections will be performed on a yearly schedule by the CHO, utilizing the Laboratory Safety Checklist in Appendix I, and submitted to the Provost and Vice President for Academic Affairs. The purpose of this is to identify new or unforeseen hazards, assess control measures, and to ensure that the safety equipment is used and procedures are followed and maintained.

Where control measures are found to be insufficient, additional measures, such as ventilation, modified work practices, or additional personal protective equipment, shall be obtained or developed and implemented and the Chemical Hazards Preparation forms updated as needed.

## 6.2. Emergency Safety Equipment

The facility/university will provide adequate sinks, eyewash stations, safety showers, fire extinguishers, first aid kits, chemical spill kits, emergency alert systems, and limited personal protective equipment.

### 6.2.1. Sinks, Eyewash Stations, and Safety Showers

Inspection of safety showers and eyewash stations will be performed by the LSC weekly for eyewashes and monthly for showers using the checklist in Appendix G to confirm they are in compliance and in good working order. Date of inspection and condition will be recorded on each station.

Any necessary maintenance will be reported to the lab operators and planned for times when the laboratory is not in use when possible. If this is not possible, classes may need to be relocated, altered, or rescheduled until safety equipment is restored.

### 6.2.2. First Aid and Chemical Spill Kits

First aid kits should be readily available in every lab.

Chemical spill kits should be readily available in every lab where there is an eyewash/shower.

### 6.2.3. Fire Safety and Extinguishers

In case of a fire, follow the procedures in the Athens State Emergency Response Plan, found in the policy library under Administrative Policies. Safety Guidelines is also posted near the exits to each lab.

In preparation for a fire, the following guidelines must be followed by the University:

- Fire Extinguishers shall be placed near evacuation routes and in areas of high hazards.
- Monthly visual inspections of fire extinguishers shall be monitored and annual inspections handled and recorded by Facilities, including hydrostatic testing as required by OSHA standard 1910.157(f).
- Employees expected to use extinguishers to put out incipient stage fires shall receive training as required by OSHA standard 1910.157(g).

In addition, every individual who works, teaches, or learns in a laboratory, as well as the individuals that supervise those individuals, must ensure to:

- Never block escape routes in the lab.
- Never block a fire door opening.
- Never store materials in walkways or on / near a counter's edge.

### 6.2.4. Protective Equipment and Apparel

It is essential to wear appropriate protective equipment and apparel when working in a laboratory. Guidelines are provided below.

- Face shields, gloves, and sterilizing solution for bacteria will be provided to the student.

- Students are required to purchase their own safety goggles and lab coats. Spare safety goggles and coats are available on a limited basis only, according to student need.
- Selection shall be based upon an assessment of the hazards of the chemical (i.e. corrosive) and on the hazards of the process (i.e. splashing.) and shall be noted on the Chemical Hazards Preparation form. PPE selected on the Form shall be available prior to exposure to the chemical or process. PPE may include but are not limited to the following:
  - Face shield or Safety glasses/goggles that meet ANSI Z87.1 Standards. Wear chemical safety goggles with face shield when using large quantities, or chemical safety goggles when using small quantities of liquids, safety glasses for solids.
  - Hair ties will be required to contain long hair. Floppy clothing shall be restrained, either by wearing a lab coat or by other means.
  - Feet shall be adequately covered to protect them from chemical hazards. Sandals or open toed shoes will not be allowed in the lab. Splashes of chemicals to shoes or clothing shall be cleaned off immediately.
  - Wear a lab coat or rubber, neoprene, or PVC apron when using large quantities and splash potential exists. Lab coats and aprons shall be discarded if damaged sufficiently to reduce protective quality.
- Never leave the laboratory wearing PPE, especially contaminated PPE.
- Gloves must be used if the chemical will cause immediate harm upon contact with skin.
  - Appropriate gloves must be selected in compliance with the OSHA standard on general requirements for personal protective equipment (29 CFR 1910.132). Glove selection shall be specific to the hazard, the tasks being performed, and in compliance with the OSHA standard on hand protection (29 CFR 1910.138).
  - Select gloves of the correct size and fitting to reduce likelihood of tearing or interference with dexterity.
  - Where multiple chemicals are used in an experiment and require different gloves further research is required to ensure the gloves will provide adequate protection. Alternately, double gloving, one of each, is an option.
  - Evaluate tasks for potential penetration, physical and chemical, and tearing by the processes in the operation.
  - Before use, inspect gloves for physical damage and check for expiration date.
  - Change gloves after use, after chemical splashes, and when tears or punctures are observed.
  - Remove, rinse, or replace contaminated gloves before taking off safety glasses, using a writing implement, answering the phone, etc.
  - Remove gloves in a way that avoids the contaminated exterior contacting the skin.
  - Dispose of contaminated gloves according to the contaminating chemical disposal guidelines.

- Check your hands and wrists for redness or discoloration indicating exposure after removal of gloves.
- Wash hands after removing gloves.
- Do NOT reuse gloves.

#### 6.2.5. Emergency Alert Systems

The labs have four emergency alert automation systems.

##### 6.2.5.1. Hoods

The hoods have a local audible alert that engages when the sash to the hood is opened too much for poor ventilation and requires a silence button to be pushed or the sash level to the hoods adjusted to proper height levels.

##### 6.2.5.2. Eyewash and Showers

The eyewashes and showers have a local audible alert when in use.

##### 6.2.5.3. Fire Alarms

The fire alarms are both an audible alert and an electronic signal alert sent out to local fire department. This is compliant with Alabama Fire Alarm Code 14.2.1 & 14.2.2.1.

##### 6.2.5.4. Emergencies

There is both a text sent out and an audible alarm if there is a university emergency.

### 6.3. Ventilation

#### 6.3.1. Building Ventilation

Any alterations to the ventilation system shall be made only by qualified personnel (HVAC engineer).

#### 6.3.2. Chemical Hoods

The University will monitor and maintain chemical safety hoods. The following guidelines must be followed by the University:

- Laboratory fume hoods during use shall be operate with a minimum average of 100 cubic feet of air moved per minute (CFM) at all times.
- All fume hoods shall be checked quarterly using Appendix H: Quarterly Laboratory Hood and Ventilation Inspection Checklist and tested every year to verify that the hood readouts are accurate within ten percent.
- Physical Plant can repair belts and adjust damper controls pertaining to hoods.
- Vertical sash fume hoods operated at sash stop level shall have an alarm that gives a warning when the sash is raised above the sash stop position. The stop position is usually located at three-fourths ( $\frac{3}{4}$ ) open. The sash stop position may not be lower than 18 inches above the working surface.
- Combination vertical/horizontal sash fume hoods shall have an alarm that gives a warning when the sash is not reaching its minimum flow rate. The horizontal glass should be fixed so that the glass is solid when using the hood for suction.

- Regularly check the ventilation in the hoods for proper airflow and that the minimum flow alarm is in good working order.

All laboratory personnel must follow proper chemical hood usage when working in a laboratory. Guidelines are provided below.

- Always use a fume hood when working with volatile substances, with substances or reactions that produce toxic vapors, with concentrated acids and bases, with chemicals having a potential exothermic reaction or the potential for over flow, when there is a potential for exposures above limits, and where recommended by the SDS.
- Verify that the exhaust system is operating before working in the hood. Taping a strip of paper, tissue, or ribbon at the face of the hood will indicate the direction of the air flow based on movement.
- When operating the fume hood, the sash should be positioned to maximize the protection to the user. Raised half open is suggested.
- Never lean into the fume hood while hazardous chemicals are being used or when in use.
- Do not use the fume hood as a storage area or block the hood exhaust airflow.
- If hood is not working properly, experiment must be stopped unless moved to another proper working hood.

#### 6.3.3. Air Monitoring

- Where air monitoring data shows an exposure above Permissible Exposure Limits (PELs), the procedure shall be discontinued until employee protection is developed and implemented.

### 6.4. Storage

#### 6.4.1. Acid and Corrosives cabinets

- Bottles of acid shall be stored in an acid/corrosive cabinet.
- Bottles of base shall be stored in a base/corrosive cabinet.
- Never store acids and bases together.
- Oxidizing acids such as Nitric Acid ( $\text{HNO}_3$ ) shall be further isolated from other acids in its proper storage.

#### 6.4.2. Flammable Storage Cabinets

- All solid or liquids that are flammable at 140 degrees Fahrenheit or less should be stored in flammable storage cabinets.
- Flammable storage cabinets shall not be used for non-flammable items.
- Where incompatible flammable chemicals must be stored in the same cabinet, steps must be taken to prevent mixing if containers leak or spill, such as placement in separate dish pans.



- Small portable gas cylinders should be stored in their own separate flammable storage cabinets.

#### 6.5. Heat Protection

- Where heat is applied or generated, only heat resistant glassware shall be used.
- Heat resistant gloves shall be provided.
- Protective heat resistant pads shall be supplied to prevent direct contact with books or bench tops.
- Tongs or other mechanical means shall be provided to allow manipulation of material or contents without contact.

#### 6.6. Large gas cylinders

- All gas cylinders will be properly secured to bench top, at all times with a side clamp, that can prevent tipping over and falling with a strap following the OSHA guideline 29 CFR 1926.350(a)(7).
- Cylinders shall be stored in a well-protected, well-ventilated, dry location, at least 20 ft. from any highly combustible material.
- Cylinders should be stored in an accessible location to change out and move tanks.

## 7. Chemical Procurement, Storage, and Use

### 7.1. Procurement

Each individual lab personnel will be responsible for ordering the chemicals needed to perform their desired labs. Before a new chemical is purchased:

- Obtain and read the Safety Data Sheet for each hazardous chemical.
- When possible, substitute a less hazardous chemical.
- The minimum quantity necessary shall be calculated and as close to that amount as possible shall be purchased.
- Where sufficient existing quantities of the chemical are available, the chemical shall not be purchased.
- A new chemical provider's SDS will be compared to the SDS used in current hazard assessments prior to purchase for chemical mixtures or dilutions.
- The SDS shall be stored alphabetically in a 3-ring binder located in the Stockrooms N301A and N306A and be readily accessible to employees during each work shift. A separate 3-ring binder for SDS of chemicals no longer present is located in the Satellite Accumulation Area (SAA), Room N306 closet. The SDS for these chemicals will be saved for 30 years from the date of last use noted on the Sheet.
- Where there is potential for exposures to exceed PELs and Threshold Limit Value (TLVs) as described on the SDS, evaluation of new engineering controls, replacement of the chemical, or modification of the process shall be considered.

- Blue chemicals at a level 3 or 4 (highly toxic, carcinogens, reproductive toxins, etc.), White chemicals at a level 2 or above (highly reactive, explosive, etc.), and Level 4 Red Chemicals (can ignite at room temperature), as defined by the National Fire Protection Association (NFPA), will not be added to the inventory without permission of the LSC, obtaining or implementing specific engineering and work practice controls, and PPE as required by OSHA regulation 1910.1450(e)(3)(viii). If a classroom laboratory requires one of the chemicals described above that is not already present in the chemical inventory and cannot be substituted with a less hazardous substitute, the instructor must provide the product information to the LSC and receive confirmation that the chemical can be properly stored, used, and disposed prior to purchase. The LSC will complete the Chemical Hazards Preparation Form in Appendix F prior to purchase, including safe work practices and emergency procedures, and provide them to the instructor. Proper storage, usage, disposal facilities, and equipment must be present on site prior to ordering the chemical.
- Available PPE shall be evaluated for resistance to the new chemical. If it is not sufficient either it shall not be purchased or:
  - PPE known to be resistant to the chemical shall be purchased.
  - The Certification of Hazard Assessment for PPE shall be updated.
  - Employees using the new chemical shall be trained in the hazards and PPE. This shall be completed prior to use of the chemical.

If the chemical is donated, approval must be obtained using the Request to Accept Non-Cash Gifts Form. In addition, donated chemicals or chemicals transferred from other Athens State locations shall be accepted only after approval is obtained from the Chemical Hygiene Officer through use of the Chemical Transfer Form (Appendix J).

- It should be established that the donated chemical is in excellent condition, that an appropriate SDS is available, and that there is a specific use for the donated material.
- No container will be accepted without a Safety Data Sheet and a label clearly identifying at least the contents by name as it is found on the SDS. No container will be accepted if it is leaking.

## 7.2. Storage

All substances must be stored according to the SDS and the manufacturer's instructions. This section addresses the main general categories of storage. Specific storage details are found in the SOPs (See Section 12).

### 7.2.1. General Chemical Storage

- Chemicals will be stored in accordance with accepted standards of compatibility.
- Incompatibles shall never be stored together.
- An inventory list arranged alphabetically will be posted in the storage room.
- Safety Data Sheets will be arranged alphabetically and located in the storage room.

- Chemicals, reagents, or apparatus should not be stored on lab benches.
- Materials cannot be stored in aisle ways.
- Shelves should be organized with labels facing out.
- If a label becomes defaced or degraded, then the reason for this condition shall be identified (e.g., student defacement, poor pouring practices, seepage from under lid due to warm storage conditions) and corrected wherever possible. Either (1) a new label may replace the previous one, or (2) a method of labeling (e.g., laminating the label attached with a twist tie, labeling the shelf, or putting clear plastic tape over the label on the bottle) shall be implemented.
- Where a lesson requires unlabeled containers, they shall be stored in such a way that their contents is identified when not under the direct control of the instructor.
- Sealed containers, such as for biological specimens, shall be labeled, have an SDS, and employees shall be trained in the hazard of the chemicals in the container.
- Food items used in experiments shall be clearly marked as “not for food use” and shall have an SDS, where possible, for safe storage and use.
- The LSC shall examine stored chemicals at least annually for replacement, deterioration and container integrity. Yearly inventories will be conducted and unneeded items will be disposed of properly.
- At least one portable fire extinguisher having a rating of not less than 12-B units shall be located outside of, but not more than 10 feet from, the door opening into any room used for storage.
- When sprinklers are provided, they shall be installed in accordance with OSHA code 1910.159.
- Materials which will react with water shall not be stored in the same room with flammable or combustible liquids.

#### 7.2.2. Flammable/Combustible Liquid Storage

- Chemical storage shelves with closeable doors shall be used for flammable materials.
- Open flames and smoking shall not be permitted in flammable or combustible liquid storage areas.
- Suitable fire control devices, such as small hose or portable fire extinguishers, shall be available at locations where flammable or combustible liquids are stored.
- At least one portable fire extinguisher having a rating of not less than 12-B units must be located not less than 10 feet, nor more than 25 feet, from any Class I or Class II liquid storage area located outside of a storage room but inside a building. Class I liquids have a flash point below 73 degrees Fahrenheit and a boiling point below 100 degrees Fahrenheit. Class II liquids have a flash point at or above 100 degrees Fahrenheit and a boiling point below 140 degrees Fahrenheit.

#### 7.2.3. Toxics Storage

- Toxic substances shall be segregated in a chemical storage cabinet off limits to unauthorized individuals.
- Specific storage details are found in the SOPs (See Section 12).

#### 7.2.4. Corrosives Storage

- Chemical storage shelves with closeable doors shall be used for corrosive materials.
- Specific storage details are found in the SOPs (See Section 12).

#### 7.2.5. Reactives Storage

- Specific storage details are found in the SOPs (See Section 12).

#### 7.2.6. Volatiles Storage

- Specific storage details are found in the SOPs (See Section 12).

#### 7.2.7. Biohazard Storage

- Specific storage details are found in the SOPs (See Section 12).

#### 7.2.8. Compressed Gas and Aerosol Storage

- Specific storage details are found in the SOPs (See Section 12).

### 7.3. Distribution from Storage Area

- When bulk quantities of chemicals are hand carried, the container will be placed in a bottle carrier or bucket.
- When the need for the container has been concluded it shall be returned to the storage area.

### 7.4. Use

- Usage shall be in compliance, with following the General Guidelines for Working in a Laboratory (Section 3)
- If a chemical is newly deemed a hazardous chemical (carcinogens, reproductive toxins, radioactive, etc.), proper provisions will be made in accordance with OSHA regulation 1910.1450(e)(3)(viii).

### 7.5. Transfer

- Transfer of chemicals between buildings will be done with the accompaniment of a Chemical Transfer Form (Appendix J).
- Transferred chemicals will be treated as described in 7.1. Procurement or processed as described in 9. Hazardous Waste Management.

## 8. Signs and Labels

All laboratory spaces and hazards will be identified by appropriate public signage:

- Emergency telephone numbers will be posted in labs and the main office.
- Signs to distinguish areas where food and beverages are prohibited
- Warnings at areas where unusual hazards exist will be posted.
- Doors leading to a room where chemicals are stored will have the types of hazards posted, such as air reactive, associated with the chemicals being stored.
- Identifying labels must show contents of containers and associated hazards, including waste containers, as described under 7.2. Chemical Storage and 9. Hazardous Waste Management.

### 8.1. Inventory of Chemicals

This inventory will be maintained by all professors and the LSC and can be found in the front of the SDS book.

- When ordering chemicals, the person submitting the Request for Purchase Order (RPO) must notify the LSC so that the Inventory of Chemicals and SDS can be updated or do so themselves.
- Once received, the received date must be added to the container so that oldest stock can be used up first.
- The inventory will be updated at least annually by the LSC to remove unused, expired, discolored, or decomposed chemicals from the inventory list.

## 9. Hazardous Waste Management

Athens State is considered a Very Small Quantity Generator (VSQG) by the EPA, which defines a VSQG as those institutions that generate 100 kilograms or less per month of hazardous waste or one kilogram or less per month of acutely hazardous waste. Waste management in Waters Hall is designed to follow federal and state regulations to prevent release of hazards into the environment.

Hazardous waste in Waters Hall is produced in small amounts for educational purposes. These wastes can include Chemical Waste, Sharps, including broken glass, and Biohazardous Waste.

### 9.1. Waste Management Plan

Prior to procurement and use, a plan for hazardous waste must be in place. These plans must consider:

- Waste minimization
- Substitutions, when possible
- Proper methods of accumulation and storage
- Proper methods of disposal

### 9.2. Hazardous Waste Accumulation

All hazardous waste must be stored appropriately until properly disposed.

- Liquid waste is segregated by compatibility containers that are labeled as required in the Waste Disposal section. Containers are located in the satellite accumulation area (SAA).
- Liquid or soluble waste that can be disposed of down the drain shall be discarded while the water is running at sufficient volume to dilute the substance as needed but not to create splashing of the concentrated substance outside the sink.
- Flammable or combustible waste material and residues shall be kept to a minimum, stored in closed glass containers and disposed of daily.

### 9.3. Chemical Waste Disposal Program

Identified hazardous waste will be collected, segregated, stored and disposed of in compliance with all current local, state and federal regulations.

- Use SDS guidelines to determine proper disposal methods.
- The LSC will ensure that all containers of hazardous waste are properly labeled prior to disposal. The waste chemicals must be identified by their properties, characteristics, and percentages. Use the proper chemical name (not formulas) and include proportions of a mixture.
- The date the waste container is full or the day it is picked up for disposal will be displayed on the container.
- Waste will be stored in the SAA until pick-up is completed.
- All waste must be kept in sealed containers at all times, unless actively poured into the container. Ziploc bags for dry debris must also be labeled and sealed.
- Do not evaporate waste.
- Do not mix incompatible wastes. Ensure the waste container is compatible with the waste and use the appropriately sized container.
- Indiscriminate disposal by pouring waste chemicals down the drain or adding them to refuse for landfill burial or evaporation is unacceptable.
- If a container is 90% full, contact LSC as soon as possible.
- LSC will monitor SAA and arrange for hazardous waste disposal pickup through certified waste haulers.

### 9.4. Sharps Disposal, including Broken Glass Disposal

Sharps include needles, razor blades, scalpels, etc, as well as broken glass.

- All sharps must be disposed of in designated sharps container and disposed of as biohazardous waste.

- Broken glass that is not contaminated with chemical or biohazardous waste must be disposed of in white containers specifically maintained for broken glass. The LSC is responsible for checking on and disposing of these containers as necessary. Broken glass contaminated with chemical or biohazardous waste must be disposed of as appropriate for the contaminating hazard.

### 9.5. Biohazardous Waste

Biohazardous waste includes infectious or potentially infectious objects, including sharps, infected or potentially infected solid waste, infected or potentially infected liquid waste, and infected or potentially infected animal or pathological wastes. Items considered biohazardous waste must be cleaned or disposed of appropriately.

- Sharps include needles, razor blades, scalpels, etc., as well as broken glass.
- Infected or potentially infected solid waste includes loops, tubing, pipette tips, gloves, etc. used with infectious or potentially infectious organisms or that comes into contact with solid or liquid animal waste, including humans.
- Infected or potentially infected liquid waste includes cultures, stocks, etc. of infectious or potentially infectious organisms.
- Infected or potentially infected animal or pathological wastes includes unsterilized carcasses, tissues, bodily fluids, bedding, etc. from animals, including humans.

## 10. Incident Clean up Protocol

After any medical emergencies are addressed, prompt response to chemical spills is critical to protect student and worker health and safety and to mitigate adverse effects to the environment. Chemical spills can be divided into two categories based on amount and type of chemical: Major Spills and Minor Spills.

### 10.1. Minor Spills

For small spills of less than 4 liters (~1 gallon) of liquid or 2.3 kilograms (~5 pounds), of solid of hazardous chemical, personnel with CHP training may clean up if the perceived risk is low. For instance, a 5 mL spill of acetone on a tabletop would be considered a Minor Spill. Any spill of Blue chemicals at a level 3 or 4 (highly toxic, carcinogens, reproductive toxins, etc.), White chemicals at a level 2 or above (highly reactive, explosive, etc.), and level 4 Red Chemicals (can ignite at room temperature) as defined by the National Fire Protection Association (NFPA) should be treated as a Major Spill. Refer to section 12.1 for guidance. Notify the LSC or professor and have personnel in the area restrict access, as appropriate.

- Eliminate all sources of ignition and turn off equipment. If it is not safe to do so, treat the spill as a Major Spill.

- Review the SDS for the spilled material to determine the appropriate level of protection.
- Wear gloves and protective eyewear. Do not attempt cleanup if you feel unsure of your ability to do so or if you perceive the risk to be greater than normal laboratory operations.
- Spill kits shall be applicable to the hazards and kept stocked by an exit.

## 10.2. Major Spills

A major spill is a spill of a hazardous material is one greater than 4 liters (~1 gallon) of liquid or 2.3 kilograms (~5 pounds) of solid, any unknown chemical, or if it will take longer than 15 minutes for you to clean-up. For example, dropping a 4 L stock bottle of acetone would be considered a major spill.

- If the spill creates a life-threatening emergency, contact 911.
- Evacuate any students and / or follow emergency procedures appropriate for exposure, i.e. use the chemical shower if necessary and it is safe to do so.
- If there is time, turn off equipment and take SDS book with you on the way out.
- Notify Athens State Security to report the spill and CHO to help with proper cleanup and disposal procedures, including access to the chemical inventory, if required.
- Be prepared to describe the chemical hazard and provide the SDS, if known.
- If volatile materials are involved, building residents shall be notified to go to 100% outside air and Physical Plant should be called to turn off the HVAC to prevent contamination of recycled air.

### Incident Reporting and Follow-up:

- Report all occupational injuries or illness within 24 hours using the On-The-Job Injuries Policy, found under Human Resource Policies.
- The CHO should be notified of laboratory incidents in order to help prevent repeat injuries.
- Personnel are encouraged to report "near misses" to the CHO, as they are considered a precursor to actual incidents.
- The CHO is to conduct (or coordinate) an investigation of all incidents and "near misses." The goal of the investigation is to identify and address any deficiencies in the Standard Operating Procedures or Chemical Hazard Preparation Form that may have contributed to the incident and correct/update the CHP to address these issues.

## 11. Medical Reporting

All employees who work with hazardous chemicals shall be provided with an opportunity to receive medical attention, including any follow-up examinations which the examining physician determines to be necessary, under the following circumstances:

- Employees exposed to spills, leaks or explosions of hazardous chemicals.
- Employees who show signs or symptoms associated with exposure to hazardous chemicals.



Employees who may fall under the above conditions shall inform the Chemical Hygiene Officer and Campus Security.

Employees with signs and symptoms requiring immediate treatment or injuries from explosions shall go directly to the emergency room to receive treatment and notification to the CHO shall be made by others or when the employee is physically able.

In the event of an on-the-job emergency, the Chemical Hygiene Officer shall provide the following information to the physician:

- The identity of the hazardous chemical(s) to which the employee may have been exposed;
- A description of the conditions under which the exposure occurred including quantitative exposure data, if available; and
- A description of the signs and symptoms of exposure that the employee is experiencing, if any.

In accordance with the University's On-the-Job Injuries policy, emergency or not, the injured employee or student must make a report to campus security within 24 hours. When the employee is not clinically able to affect such notice, notification may be made by a representative of the employee. Said representative must be reasonably knowledgeable concerning the injury and the condition of the employee.

- The employee must also complete the On-the-Job Injury/Illness Incident Report.
- In accordance with the University's Personal Injury/Personal Property Damage on University Property policy, the University may pay uncontested claims up to \$5000 without processing through the Alabama State Board of Adjustment. The employee/student must complete the Personal Injury/Personal Property Damage Claim Form.
- For claims over \$5000, the Human Resources office can give guidance on making a claim through the Alabama State Board of Adjustment. As needed, the Human Resource office will coordinate with the employee's physician on all medical information and return to work information.
- All related documentation will be stored by the Human Resource office in accordance with their records retention policies.

Records pertaining to the laboratories shall also be maintained by CHO and kept in the SAA file cabinet.

- Accident reports will be written and retained for all accidents involving injuries, property damage and near misses by chemical, biological or environmental exposure or improper handling.

- Failure of engineering controls, PPE, containers, or safe work practices shall be recorded and reviewed for accident prevention purposes by the Chemical Hygiene Committee or the Chemical Hygiene Officer.

## 12. Standard Operating Procedures

### 12.1. Chemical Hazard Information by Characteristic

Knowing the hazards of a chemical and how to properly handle and dispose of these compounds, including during the pre- and post-lab operations, will help prevent harmful and unnecessary exposures. To mitigate risk, the following must be considered prior to use:

- Establishment of a designated area;
- Identification of proper PPE;
- Use of containment devices such as fume hoods or glove boxes;
- Procedures for safe removal of contaminated waste;
- Decontamination procedures; and
- Emergency Response

For all compounds:

- Work shall be performed with the smallest possible amount of the chemical or determine if a less hazardous chemical or process could be used as a replacement.
- Containers shall be kept closed as much as possible to reduce potential for spilling and exposure to vapors.
- Contaminated gloves shall be removed before using a writing implement to take notes.

### 12.1.1. High Acute Toxicity, Reproductive Toxins, Carcinogens

This includes all Blue chemicals above a level 2, as defined by the National Fire Protection Association (NFPA). Blue chemicals at a level at 2 or below should be stored as appropriate. Examples of blue chemicals include sodium chloride (Blue level 1), hydrogen peroxide (Blue level 2), chlorine (Blue level 3), and cyanide (Blue level 4).

#### Storage

These chemicals should be isolated from any students and kept in a safe place in the stock room on their own shelf, isolated from the rest of the reagents, designated for them.

#### PPE

- Wear gloves, eye protection, and lab coats as directed by the SDS.
- Remove, rinse or replace gloves before taking off eye protection.
- Work in a chemical fume hood.

#### Controls

- Blue chemicals may only be handled by CHP trained individuals. User must be knowledgeable in the dangers of skin absorption and inhalation exposure, the reactivity to other compounds or reagents, and what to do if breakage occurs.
- Prior to bringing the chemical from the storage area the work bench shall be cleared of all materials not immediately required for the lesson or process.
- Work with smallest amounts possible and keep containers closed or covered as much as possible

#### Disposal

LSC will properly store the Blue waste and dispose of it annually in the waste pick-ups.

#### Emergency Procedures

- If any container of Blue waste is broken, do not attempt to clean up.
  - Evacuate the room or area until proper personal with (Class C) PPE or better can clean up. (Proper PPE would consist of the following at a minimum: gloves, full face mask, and TYVEX suit.)
  - Contact Campus Security and emergency services.
  - Be ready to describe the chemical hazard and provide the SDS, if known.
- In the event of exposure through inhalation, ingestion, absorption, or puncture wounds, contact emergency services immediately: 911 or the local fire department at (256)233-8710.

- Be ready to describe the chemical hazard and provide the SDS, if known.
- Rinse small contact spills with running water for at least 15 minutes, removing affected clothing.
- Flush eyes for at least 15 minutes, holding eyes open.
- Shower for minimum of 15 minutes, removing affected clothing.
- Seek medical attention.

### 12.1.2. Corrosive Solids

Corrosive means a chemical that causes visible destruction of or irreversible alterations in living tissue by chemical action at the site of contact. Corrosive solids, such as sodium hydroxide and phenol, can cause burns to the skin and eyes. Dust from corrosive solids can be inhaled and cause irritation or burns to the respiratory tract. Many corrosive solids, such as potassium hydroxide and sodium hydroxide, can produce considerable heat when dissolved in water. If a material is corrosive, it will be indicated as a Non-standard White symbol by the National Fire Protection Association (NFPA).

The following work practices shall be followed when handling, storing and disposing of corrosive solids:

#### Storage

Since corrosives produce heat when dissolved in water and can react violently with other chemicals, they must be stored separately in the corrosives cabinet, away from water.

#### PPE

- Wear gloves, eye protection, and lab coats as directed by the SDS.
- Remove, rinse or replace gloves before taking off eye protection.
- Work in a chemical fume hood.

#### Controls

- Set up for the least amount of traffic around the bench work area.
- Remove all non-essential chemicals, books, equipment, etc. from the work area prior to placing the corrosive solid on the bench.
- When mixing with water, always slowly add the corrosive solid to water, stirring continuously. Caution: some water reactive corrosive solids can 'skitter' across the surface and may 'jump' out of the container.
- Review the potential hazards from the corrosive solid and from the process to select the necessary engineering and work practice controls.
- Where heat is a byproduct of the process, the glassware selected shall be heat resistant and heat resistant gloves that can be worn over the chemical resistant gloves shall be available. Also, any flammable material shall be moved away from the work area and the work.
- If there is a possibility of generating a significant amount of dust, hazardous vapors, volatile reaction that produces gas, potential for explosion or material bubbling or splashing out of the container then conduct work in a fume hood.

### Disposal

- Where necessary due to potential hazards, such as generation of heat, corrosive solids shall be disposed of in segregated, labeled waste.
- Waste must be stored away from water. The LSC will take the necessary steps in securing and holding the waste in the SAA site until scheduled pick-up.

### Emergency Procedures

- In the case of minor spills: for Corrosive liquids or solids spills do not add water!
  - Use the chemical spill kits for clean-up and place waste in the spill kit bucket.
  - For Acids and / or Bases use yellow diapers.
  - For Oils and / or solvents use white diapers.
  - For the clean-up of solids: sweep up solids into empty spill kit bucket.
  - If unsure, use kitty litter provided to control any spill.
- In the event of exposure through inhalation, ingestion, absorption, or puncture wounds, contact emergency services immediately: 911 or the local fire department at (256)233-8710. Be ready to describe the chemical hazard and provide the SDS, if known.
  - Rinse small contact spills with running water for at least 15 minutes, removing affected clothing.
  - Flush eyes for at least 15 minutes, holding eyes open.
  - Shower for minimum of 15 minutes, removing affected clothing.
  - Seek medical attention.
- In case of a major spill: Evacuate the room or area until proper personal with (Class C) PPE or better can clean up. (Proper PPE would consist of the following at a minimum: gloves, full face mask, and TYVEX suit.)
  - Contact Campus Security and emergency services.
  - Be ready to describe the chemical hazard and provide the SDS, if known.

### 12.1.3. Corrosive Liquids

Corrosive liquids (e.g. mineral acids, alkali solutions and some oxidizers) represent a very significant hazard because skin or eye contact can readily occur from splashes and their effect on human tissue generally takes place very rapidly. Bromine, sodium hydroxide, sulfuric acid and hydrogen peroxide are examples of highly corrosive liquids. If a material is corrosive, it will be indicated as a Non-standard White symbol by the National Fire Protection Association (NFPA).

The following work practices shall be followed when handling, storing and disposing of corrosive liquids:

#### Storage

- Acids and bases shall be segregated for storage.
- Nitric Acid shall be isolated in the acid storage cabinet.
- As with all chemicals, liquid corrosives shall be stored below eye level.

#### PPE

- Wear gloves, eye protection, and lab coats as directed by the SDS.
- Remove, rinse or replace gloves before taking off eye protection.
- Work in a chemical fume hood.

#### Controls

- To avoid a flash steam explosion due to the large amount of heat produced, always add acids or bases to water (and not the reverse).
- These mixtures shall be performed in the fume hood. See corrosive solid section for management of heat hazards.
- Adequate quantities of spill control materials shall be readily available.
- A spill kit for acids and bases is available in every lab by an exit.

#### Disposal

- Ensure that the properly labeled hazardous waste container is available and has sufficient space for the type of corrosive used and the products, including mistakes, prior to beginning the preparation phase.

#### Emergency Procedures

- In the case of minor spills: Do not add water!
  - Use the chemical spill kits for clean-up and place waste in the spill kit bucket.

- For Acids and / or Bases use yellow diapers.
  - For Oils and / or solvents use white diapers.
  - For the clean-up of solids: sweep up solids into empty spill kit bucket.
  - If unsure use kitty litter provided to control any spill.
- In the event of exposure through inhalation, ingestion, absorption, or puncture wounds, contact emergency services immediately: 911 or the local fire department at (256)233-8710. Be ready to describe the chemical hazard and provide the SDS, if known.
  - Rinse small contact spills with running water for at least 15 minutes, removing affected clothing.
  - Flush eyes for at least 15 minutes, holding eyes open.
  - Shower for minimum of 15 minutes, removing affected clothing.
  - Seek medical attention.
- In case of a major spill: Evacuate the room or area until proper personal with (Class C) PPE or better can clean up. (Proper PPE would consist of the following at a minimum: gloves, full face mask, and TYVEX suit.)
  - Contact Campus Security and emergency services.
  - Be ready to describe the chemical hazard / provide the SDS, if known.



#### 12.1.4. Reactives

Reactive chemicals are substances that can enter into violent reactions, releasing large amounts of light, heat, and gases. A number of reactive chemicals are recognized explosives, requiring only a mild initiating force for detonation. Other reactive chemicals are capable of detonation but require a stronger initiating force. Some reactive chemicals will not detonate but can enter violent reactions producing large quantities of heat and explosive gases.

A material's reactivity level will be indicated in Yellow by the National Fire Protection Association (NFPA). Anything at or above an NFPA level 2 can react violently with water and / or explode. Highly reactive chemicals must be handled with extreme care, as even milligram quantities of some chemicals can result in violent explosions. Level 2 reactives are rarely used outside of instructor demonstrations, e.g. sodium in water.

#### Classes of Reactives

While almost all chemicals will react with something, some chemicals are so reactive that the reaction can create a hazard. These chemicals can react vigorously with moisture, oxygen, or other substances. Reactive chemicals are classified as explosives, strong oxidizing or reducing agents, acid sensitives, water reactive, air reactive, and special organic compounds.

Solid Reactive examples include sodium, potassium and lithium metals; acid anhydrides, acid chlorides and salt hydrides.

Liquid Reactives examples include organic halides, phosphorous trichloride, titanium tetrachloride, butyl lithium, and hydrazine.

The following work practices shall be followed when handling, storing and disposing of reactive chemicals:

#### Storage

- Quantities shall be limited to the amount necessary for the work in progress.
- Water reactive substances cannot be stored in the same room with combustible or flammable materials, OSHA Standard 1910.106(d)(7)(iii).

#### PPE

- Safety glasses, face shield, gloves, and a laboratory coat shall be worn at all times when handling, transporting, or manipulating reactive chemicals.
- Safety shields shall be used as necessary.
- Wear gloves, eye protection, and lab coats as directed by the SDS.
- Remove, rinse or replace gloves before taking off eye protection.
- Work in a chemical fume hood.

### Controls

- Prior to bringing the chemical from the storage area the work bench shall be cleared of all materials not immediately required for the lesson or process.
- Explosives shall be protected from heat and shock and shall be purchased or made immediately prior to the class and thoroughly disposed of properly afterwards.

### Disposal

- Prior to use of the chemical the method for disposal shall be prepared to ensure it is not added to a waste container with materials it will react to and that in the future such chemicals shall not be added to the container the reactive chemical is in. The waste container shall immediately be labeled as to its contents to reduce such a problem in the future.

### Emergency Procedures

- In the event of a minor spill, clean up spills immediately. Do not use water.
  - Use the chemical spill kits for clean-up and place waste in the spill kit bucket.
  - For Acids and / or Bases use yellow diapers.
  - For Oils and / or solvents use white diapers.
  - For the clean-up of solids: sweep up solids into empty spill kit bucket.
  - If unsure use kitty litter provided to control any spill.
- In the event of exposure through inhalation, ingestion, absorption, or puncture wounds, contact emergency services immediately: 911 or the local fire department at (256)233-8710.
  - Be ready to describe the chemical hazard / provide the SDS, if known.
  - Rinse small contact spills with running water for at least 15 minutes, removing affected clothing.
  - Flush eyes for at least 15 minutes, holding eyes open.
  - Shower for minimum of 15 minutes, removing affected clothing.
  - Seek medical attention.
- In case of a major spill: Evacuate the room or area until proper personal with (Class C) PPE or better can clean up. (Proper PPE would consist of the following at a minimum: gloves, full face mask, and TYVEX suit.)
  - Contact Campus Security and emergency services.
  - Be ready to describe the chemical hazard and provide the SDS, if known.

#### 12.1.5. Volatile Chemicals

Volatile organic compounds (VOCs) as defined by the EPA's Substance Registry Services (SRS), are emitted as gases from certain solids or liquids. VOCs include a variety of chemicals, some of which may have short- and long-term adverse health effects. (examples: hexanes, acetone, methylene chloride, diethyl ether).

The following work practices shall be followed when handling, storing and disposing of Volatile chemicals:

##### Storage

- No more than a combined total of 10 gallons of flammable and combustible liquids shall be stored outside of a flammable storage cabinet unless safety cans are used.
- When safety cans are used, up to 25 gallons may be stored without using a flammable storage cabinet. Every effort shall be made to have nowhere near that quantity of material on hand.

##### PPE

- The potential for absorption through the skin with adverse health effects shall be carefully evaluated and special attention shall be paid to glove selection.
- Wear gloves, eye protection, and lab coats as directed by the SDS.
- Remove, rinse or replace gloves before taking off eye protection.
- Work in a chemical fume hood.

##### Controls

- Any part of the process that could cause splashing to the arms or body must be treated as high risk.
- Work areas shall be cleared of anything that produces a spark or flame.
- Prior to working with volatiles be sure fume hood is functioning properly and has sufficient room for the equipment, materials, and motion required for the process.
- Work in the fume hood to ensure proper ventilation when working with volatile chemicals.
- When carrying volatile chemicals through the lab, carry them in a covered container and ensure the bottle or container is capped, closed, etc.
- Work with smallest amounts possible and keep containers closed or covered as much as possible to minimize the amount of volatile gases released into the room.

## Disposal

- To be performed in compliance with the CHP and all current local, state and federal regulations.

## Emergency Procedures:

- In the case of minor spills: Turn on hoods immediately!
  - Use the chemical spill kits for clean-up and place waste in the spill kit bucket.
  - For Acids and / or Bases use yellow diapers.
  - For Oils and / or solvents use white diapers.
  - For the clean-up of solids: sweep up solids into empty spill kit bucket.
  - If unsure use kitty litter provided to control any spill.
- In the event of exposure through inhalation, ingestion, absorption, or puncture wounds, contact emergency services immediately: 911 or the local fire department at (256)233-8710. Be ready to describe the chemical hazard and provide the SDS, if known.
- In case of a major spill: Evacuate the room or area until proper personal with (Class C) PPE or better can clean up. (Proper PPE would consist of the following at a minimum: gloves, full face mask, and TYVEX suit.)
  - Contact Campus Security and emergency services.
  - Be ready to describe the chemical hazard and provide the SDS, if known.

### 12.1.6. Biohazardous Materials

Biohazardous materials include infectious or potentially infectious objects, including sharps, infected or potentially infected solids, infected or potentially infected liquids, and infected or potentially infected animal or pathological materials. Items considered biohazardous must be cleaned or disposed of appropriately.

- Sharps include needles, razor blades, scalpels, etc. as well as broken glass.
- Infected or potentially infected solids include loops, tubing, pipette tips, gloves, etc. used with infectious or potentially infectious organisms or that comes into contact with solid or liquid animal waste, including humans.
- Infected or potentially infected liquids include cultures, stocks, etc. of infectious or potentially infectious organisms.
- Infected or potentially infected animal or pathological materials include unsterilized carcasses, tissues, bodily fluids, bedding, etc. from animals, including humans.

Athens State is equipped to safely deal with Biosafety Level 1 (BSL-1) and small volume Biosafety Level 2 (BSL-2) organisms. According to the CDC,

- BSL-1 microbes are not known to consistently cause disease in healthy adults and present minimal potential hazard to laboratorians and the environment.
- BSL-2 microbes pose moderate hazards to laboratorians and the environment. The microbes are typically indigenous and associated with diseases of varying severity.

### PPE

Requirements for appropriate PPE vary according to the level of hazard of the microbe, culture volume, and aerosolization risk.

- For BSL-1 organisms, lab coats, gloves, and eye protection may be worn as needed.
- For BSL-2 organisms, lab coats, gloves, and eye protection must be worn and decontaminated.
- Procedures involving large volumes or producing aerosols cannot currently be performed at Athens State.

### Controls

Work in laboratory spaces appropriate for hazard level and with appropriate posted signage. If hazards are mixed, ensure that appropriate risk reduction is in place for all hazards.

### Emergency Procedures

- In the event of infection exposure through inhalation, ingestion, absorption, or puncture wounds, contact emergency services immediately: 911.
- In the event of a minor spill, contact the LSC or Professor(s) assigned to the lab and follow infected or potentially infected solid waste disinfection SOP below.

- In the event of a major spill, contact Campus Security and emergency services. Be ready to describe the biohazard, if known.

### Storage, Cleaning, and Waste Disposal

Each class of biohazardous waste has specific decontamination or disposal procedures. Wastes that are mixed or contain other hazardous chemicals must be handled in order from most hazardous / highest risk to lowest hazard / lowest risk.

#### Sharps

Sharps must be disposed of in designated red sharps containers. The LSC will manage this waste, disposing of sharps containers as appropriate by returning the container to the designated commercial disposal site.

#### Broken Glass

Broken glass must be disposed of in designated white broken glass containers. The LSC will manage this waste, disposing of broken glass as appropriate.

Broken glass that is known to be contaminated with a potentially infectious agent must be decontaminated prior to its disposal in broken glass containers via autoclaving or use of a chemical disinfectant as described below.

#### Infected or potentially infected solid waste

Prior to disposal, infected or potentially infected solid waste must be either:

- disinfected with a 10% solution of regular household bleach (8.25% sodium hypochlorite) or a 70% ethanol solution for 10 minutes or
- sterilized in an autoclave for at least 30 minutes at a minimum temperature of 121° C and 15 pounds of pressure.

#### Infected or potentially infected liquid waste

Prior to disposal down a drain, infected or potentially infected liquid waste must be either:

- disinfected with a final concentration of 10% solution of regular household bleach (8.25% sodium hypochlorite) or 70% ethanol solution for 10 minutes or
- sterilized in an autoclave for at least 30 minutes at a minimum temperature of 121° C and 15 pounds of pressure.

#### Infected or potentially infected animal or pathological wastes

Prior to disposal, infected or potentially infected animal or pathological wastes must be either:

- disinfected with a 10% solution of regular household bleach (8.25% sodium hypochlorite) or a 70% ethanol solution for 10 minutes or
- sterilized in an autoclave for at least 30 minutes at a minimum temperature of 121° C and 15 pounds of pressure.

#### Autoclave Validation

Autoclaves must reach the adequate temperature and holding time to sterilize biological agents and waste. The autoclave should reach 15 pounds/square inch pressure and at least 250 degrees Fahrenheit temperature for 20 minutes.

Each infectious or potentially infectious waste disposal via autoclave must be validated using a biological indicator for steam sterilization. Validation should be logged prior to disposal.

## Appendix A: Lab Safety Form

To be signed by students participating in a Laboratory at Athens State University.



## Safety Rules for the Laboratory

The safety instruction you will receive at the beginning of each semester is to be considered a part of the academic course content. The rules will be rigidly and impartially enforced and willful non-compliance will result in dismissal or suspension from the laboratory. You will not be allowed to begin any experiments until you have received this instruction.

The following are specific rules for students in all laboratories.

1. Eye protection is required at all times in the laboratory and where chemicals are stored and handled. Approved safety glasses must be worn. Contact lenses may not be worn in the laboratory.
2. Horseplay or other acts of carelessness are prohibited.
3. Unauthorized experiments are prohibited.
4. Eating and drinking are prohibited in the Laboratory areas.
5. Mouth suction should not be used to fill pipets.
6. Never work in the laboratory alone without supervision of a qualified laboratory instructor.
7. Confine long hair when in the laboratory.
8. Locate safety showers, fire extinguishers, first aid kits, and secondary exits.
9. Shoes (no sandals or opened toed shoes) must be worn in the laboratory.
10. Pants (to the ankle) must be worn in the laboratory.
11. Use proper protective equipment such as disposable gloves and aprons as appropriate.
12. Smoking in the laboratory is never permitted.
13. Chemicals should not be tasted.
14. Any accidents or injuries, however slight, must be immediately called to the attention of the laboratory instructor who will advise the student of the course of action to be taken.
15. Many, if not most accidents are caused by poor-housekeeping practices. Clean up as you work and keep your bench clear of extraneous backpacks, books, and other clutter.
16. Do not bring spouses, children, or friends with you to the laboratory.
17. Consult the instructor about proper disposal procedures for chemicals.
18. Read each experiment carefully and make a note of all safety instructions.
19. Review the MSDS for any chemical that you will be using in an experiment
20. Since the period of greatest susceptibility to a fetus is believed to be in the first 8-12 weeks of pregnancy, which includes a period when a woman may not know she

is pregnant, women of child bearing potential should request from their laboratory supervisor information on the possible fetal risk associated with their laboratory program. Information on possible fetal risk of chemical usage can also be found in the MSDS of the material used.

21. At times, student volunteers may be asked to participate in labs. By signing below, you understand that this is truly a volunteer situation and an alternative assignment will be found if you do not wish to volunteer. The same is true if you are morally or religiously opposed to any activity in the lab, such as dissection. Simply inform the instructor.
22. Results of student volunteer activities should not be shared outside of the classroom and are not a medical diagnosis.
23. I do hereby agree and consent that if I suffer discomfort, illness, harm or injury while participating in lab activities, that Athens State University's agents, officers, or employees, while they have no obligation or responsibility to do so, may provide or administer first aid to me (including but not limited to the application of antiseptics, bandages, splints, or other over the counter medications) or seek emergency medical treatment for me, and in such event, I do hereby (a) assume the financial responsibility for any costs associated with my health care and acknowledge that I am solely responsible for such costs, and (b) release, acquit, indemnify, hold harmless, and forever discharge Athens State University (including its officers, agents, employees, sponsors, and volunteers), from and against any and all actions and claims for all types of injuries, damages, costs, and compensation, that now exist or may hereafter arising from or relating to the same, including but not limited to claims related to alleged negligence of the released persons or entities.

A copy of these directions is available online in the course shell.

By signing below, you acknowledge you have read and understand these procedures and agree to abide by them.

Student's name \_\_\_\_\_

Student's signature \_\_\_\_\_

Student Number \_\_\_\_\_

Course Date \_\_\_\_\_

## **PARENTAL AGREEMENT AND INDEMNIFICATION**

**(To Be Completed where Participant Is Under the Age of Nineteen)**

As a parent or natural guardian of the above-mentioned minor, I give permission to my child or ward to participate in the aforementioned "Laboratory". I have read and understand the above Safety Rules for the Laboratory, and on my behalf and on the behalf of my child or ward, I agree to all terms contained in the Agreement, and I specifically agree to release, indemnify, and hold harmless Athens State University (including their respective affiliates, owners, directors, sponsors, officers, volunteers, employees, and agents) with respect to any and all claims that may arise from the participation of the above named minor child in the aforementioned "Laboratory".

Signed this \_\_\_ day of \_\_\_\_\_, 20\_\_.

---

*Signature of parent or guardian*

---

Print Name of parent or guardian

---

*Witness Signature*

---

Print Name of witness

## Appendix B: Field Lab Safety Form

To be signed by students participating in a Field Laboratory at Athens State University.

**ASSUMPTION OF RISK AND RELEASE AGREEMENT**  
**COURSE FIELD LABS**

I, \_\_\_\_\_ [*printed name of participant*], in consideration of being permitted to accompany or participate in the Athens State University field labs associated with \_\_\_\_\_ [*Print Course Name and Number*] during the time period of \_\_\_\_\_ [*Date(s) of Field Labs*] at the following locations: [Wheeler National Wildlife Refuge, Forever Wild First Creek: Blowing Spring, Swan Creek Greenway National Recreation Trail, North Alabama Birding Trail, Rainbow Mountain Preserve, Land Trust of North Alabama: Monte Sano Nature Preserve, Monte Sano State Park, Land Trust of North Alabama's Wade Mountain Nature Preserve, William B Bankhead National Forest, Wetlands Edge Environmental Center, Mill Creek Greenway, Indian Creek Greenway] and all activities related to the same (such trip and related activities to be collectively referred to herein as the "Activity"), I individually (for myself, my heirs, executors, guardians, legal representatives, administrators, successors and assigns) do hereby release, acquit, hold harmless, and forever discharge Athens State University, (including their respective affiliates, owners, directors, sponsors, officers, volunteers, employees, and agents), from any and all actions and claims for all types of injuries, damages, costs, and compensation, that now exist or may hereafter arise involving or related in any way to my participation in said "Activity".

I have fully read and understand this Agreement and all of its terms. I understand that this acknowledgment and assumption may affect my legal claims for damages. I am aware that this is a release of liability and a contract between myself and Athens State University. I nevertheless enter into this Agreement freely and voluntarily agree that it is binding upon me, my heirs, assigns, and legal representatives.

I agree that the terms of this Agreement shall be binding and shall be governed by the laws of Alabama and that the terms of this document shall be admissible in evidence as a binding legal document between me and the persons and entities listed above in this Agreement.

Additionally, I agree to follow the rules and procedures below.

- 1) Dress appropriately for the weather. Hiking boots, light weight pants, long sleeve shirts, and hats are recommended. Wear hiking sandals and shorts at your own risk. Do NOT wear flip flops or high heels.
- 2) Acquaint yourself with the appearance of poison ivy, poison oak, rattlesnakes, water moccasins, black widows, brown recluse spiders, and other poisonous wildlife. Treat all wildlife with respect, do not harass it, and back away slowly if you feel threatened.
- 3) If you step on a snake or are being charged by a large mammal, move away quickly.
- 4) Notify the instructor immediately if you have been injured.
- 5) Bring appropriate clothing and items for wet or muddy conditions; items such as rain gear, extra clothes, and seat covers to protect your vehicle are recommended.
- 6) Use sunscreen, mosquito repellent, allergy medication, and other items for personal protection as needed.

- 7) After being in the field, always be sure to check for ticks and other pests.
- 8) Inform the instructor about any relevant medical issues that may affect your ability to participate in an excursion or activities. It is your responsibility to ensure that you are physically fit for these excursions. If need arises, an alternative assignment will be found.
- 9) Students with disabilities are asked to register with Accessibility Services and appropriate accommodations will be made.
- 10) Follow any additional safety guidelines or behavior policies provided to you at specific sites for your safety or to protect the local wildlife. If these directions are not followed, you may be asked to leave the site. If your behavior is deemed to be dangerous or destructive, you will lose credit for the assignment. If you have acted in such a way that you have endangered yourself or your classmates, you could lose credit for the course.

Signed this \_\_\_\_\_ day of \_\_\_\_\_, 20\_\_\_\_\_.

\_\_\_\_\_ *[Signature of participant]*

\_\_\_\_\_ *[Student Number]*

#### **PARENTAL AGREEMENT AND INDEMNIFICATION**

(To Be Completed where Participant Is Under the Age of Nineteen)

As a parent or natural guardian of the above-mentioned minor, I give permission to my child or ward to participate in the aforementioned "Activity". I have read and understand the above Assumption of Risk and Release Agreement, and on my behalf and on the behalf of my child or ward, I agree to all terms contained in the Agreement, and I specifically agree to release, indemnify, and hold harmless Athens State University (including their respective affiliates, owners, directors, sponsors, officers, volunteers, employees, and agents) with respect to any and all claims that may arise from the participation of the above named minor child in the aforementioned activity.

Signed this \_\_\_\_\_ day of \_\_\_\_\_, 20\_\_\_\_\_.

\_\_\_\_\_ *[Signature of parent or guardian]*

## Appendix C: Guest Research Release Form

To be signed by guests participating in Research at Athens State University.

**ACKNOWLEDGMENT, RELEASE AND HOLD HARMLESS AGREEMENT****RESEARCH PROGRAM**

This is a legally binding agreement regarding participation in a voluntary research program designed specifically for the benefit of student learners. I acknowledge that I am not to be considered an employee, volunteer, or student of Athens State University. I also understand that upon completion of the program I am not entitled to a job, compensation, or admission as a student.

Name of participant: \_\_\_\_\_ Date of Birth: \_\_\_\_\_

Address of participant: \_\_\_\_\_

Participant Phone No.: \_\_\_\_\_ Email: \_\_\_\_\_

Emergency Contact Name: \_\_\_\_\_ Relationship: \_\_\_\_\_

Emergency Contact Phone No.: \_\_\_\_\_

In consideration of being permitted to participate in the Program, I acknowledge and willingly agree that:

1. I am participating in the Program voluntarily and of my own free will.
2. I acknowledge and fully understand that this Program may involve risk of injury, including but not limited to, serious or permanent injury, exposure to laboratory chemicals or testing materials, or death. I acknowledge and fully understand that the environment, weather or the equipment used also pose risks of injury or death. I agree to accept all responsibility for the risks, conditions and hazards which may occur whether they now be known or unknown.
3. I understand that I have the fundamental responsibility to act in a safe and alert manner. I will do everything possible to help reduce the potential for accidents. I will listen carefully to and follow all instructions and directions; I will pay attention to and follow the attached safety rules; I will ask questions if I do not understand; and I will take responsibility for avoiding or minimizing risks.
4. I further certify that I am in good health and that I have no physical limitations which would preclude my safe participation in the Program.
5. I further agree to release, indemnify, and hold harmless Athens State University (including its respective affiliates, owners, directors, sponsors, officers, volunteers, employees, and agents), from or for any claim, demand, losses, or damages arising out of any personal injury or other damages to me or to any other person, or out of any property damage, arising from or related to my participation in the Program.
6. I do hereby agree and consent that if I suffer discomfort, illness, harm or injury while participating in lab activities, that Athens State University's agents, officers, or employees, while they have no obligation or responsibility to do so, may provide or administer first aid to me (including but not limited to the application of antiseptics, bandages, splints, or other over the counter medications) or seek emergency medical treatment for me, and in such event, I do hereby (a) assume the financial responsibility for any costs associated with my health care



and acknowledge that I am solely responsible for such costs, and (b) release, acquit, indemnify, hold harmless, and forever discharge Athens State University (including its officers, agents, employees, sponsors, and volunteers), from and against any and all actions and claims for all types of injuries, damages, costs, and compensation, that now exist or may hereafter arising from or relating to the same, including but not limited to claims related to alleged negligence of the released persons or entities.

I have fully read and understand this Agreement and all of its terms. I understand that this acknowledgment and assumption may affect my legal claims for damages in the event of my death or injury to me. I nevertheless enter into this Agreement freely and voluntarily agree that it is binding upon me, my heirs, assigns, and legal representatives.

I agree that the terms of this Agreement shall be binding and shall be governed by the laws of Alabama and that the terms of this document shall be admissible in evidence as a binding legal document between me and the persons and entities listed above in this Agreement.

Signed this \_\_\_\_\_ day of \_\_\_\_\_, 20\_\_\_\_\_.

Participant: \_\_\_\_\_ [Signature]

Print Name of participant: \_\_\_\_\_

#### **PARENTAL AGREEMENT AND INDEMNIFICATION**

(To Be Completed where Participant Is Under the Age of Nineteen)

As a parent or natural guardian of the above-mentioned minor, I give permission to my child or ward to participate in the aforementioned Program. I have read and understand the above Acknowledgment, Release and Hold Harmless Agreement, and on my behalf and on the behalf of my child or ward, I agree to all terms contained in the Agreement, and I specifically agree to release, indemnify, and hold harmless Athens State University (including their respective affiliates, owners, directors, sponsors, officers, volunteers, employees, and agents) with respect to any and all claims that may arise from the participation of the above named minor child in the aforementioned Program.

Signed this \_\_\_\_\_ day of \_\_\_\_\_, 20\_\_\_\_\_.

\_\_\_\_\_ [Signature of parent or guardian]

Print Name of parent or guardian: \_\_\_\_\_

Witness Signature: \_\_\_\_\_

Print name of witness: \_\_\_\_\_

## Appendix D: Distance Learning Lab Safety Form

To be signed by students participating in a Biology Distance Learning Laboratory at Athens State University.

## Home Lab Kit Safety

While every attempt has been made to ensure that these kits use household safe products, the chemicals need to be respected in the same way that you would respect cleaning chemicals such as bleach and ammonia. Similarly, the equipment provided in this kit is very safe to use as long as you respect it in the same way that you would respect your kitchen stove or electric drill. To these ends, you agree to the following when you use these kits:

1. You will read all directions and warning labels prior to beginning the labs.
2. Have standard house hold safety items available and functioning, such as fire alarms, fire extinguishers, a first aid kit, a telephone, and water to rinse your eyes in case of splashes.
3. Keep all components of the kit away from children and pets.
4. Set up a stable table or bench in an area that is well ventilated and away from food items.
5. Clean up and dispose of chemicals appropriately away from food preparation surfaces.
6. Wear long pants, shoes, and eye protection in case of spills, splashes, and other accidents.
7. Remove contacts before performing any labs.
8. Tie back long hair.
9. Keep food and drink away from your lab area.
10. Do not eat any of the kit components.
11. Do not put any of the kit components in your mouth.
12. Clean up your lab surface with surface cleaner after completing any experiments.
13. Wash your hands after lab is completed and before breaks for food.
14. Do not smoke while performing experiments.
15. In the case of spills, avoid contact of chemicals with skin. Use a paper towel to wipe up the spill and dispose of chemicals away from children and pets.
16. In case of yeast spills, area should be disinfected with a bleach-based household cleaner.
17. At times, student volunteers may be asked to participate in labs. By signing below, you understand that this is truly a volunteer situation and an alternative assignment will be found if you do not wish to volunteer. The same is true if you are morally or religiously opposed to any activity in the lab, such as dissection. Simply inform the instructor.
18. Results of student volunteer activities should not be shared outside of the classroom and are not a medical diagnosis.
19. I do hereby agree and consent that if I suffer discomfort, illness, harm or injury while participating in lab activities, that Athens State University's agents, officers, or employees, while they have no obligation or responsibility to do so, may provide or administer first aid to me (including but not limited to the application of antiseptics, bandages, splints, or other over the counter medications) or seek emergency medical treatment for me, and in such event, I do hereby (a) assume the financial responsibility for any costs associated with my health care and acknowledge that I am solely responsible for such costs, and (b) release, acquit, indemnify, hold harmless, and forever discharge Athens State University (including its officers, agents, employees, sponsors, and volunteers), from and against any and all actions and claims for all types of injuries, damages, costs, and compensation, that now exist or may hereafter arising from or relating to the same, including but not limited to claims related to alleged negligence of the released persons or entities.

A copy of these directions is available online in the course shell.

By signing below, you acknowledge you have read and understand these procedures and agree to abide by them.

Signed this \_\_\_\_\_ day of \_\_\_\_\_, 20\_\_\_\_\_.

Participant: \_\_\_\_\_ [Signature]

Print Name of participant: \_\_\_\_\_

**PARENTAL AGREEMENT AND INDEMNIFICATION**

(To Be Completed where Participant Is Under the Age of Nineteen)

As a parent or natural guardian of the above-mentioned minor, I give permission to my child or ward to participate in the aforementioned Program. I have read and understand the above Acknowledgment, Release and Hold Harmless Agreement, and on my behalf and on the behalf of my child or ward, I agree to all terms contained in the Agreement, and I specifically agree to release, indemnify, and hold harmless Athens State University (including their respective affiliates, owners, directors, sponsors, officers, volunteers, employees, and agents) with respect to any and all claims that may arise from the participation of the above named minor child in the aforementioned Program.

Signed this \_\_\_\_\_ day of \_\_\_\_\_, 20\_\_\_\_\_.

\_\_\_\_\_ [Signature of parent or guardian]

Print Name of parent or guardian: \_\_\_\_\_

Witness Signature: \_\_\_\_\_

Print name of witness: \_\_\_\_\_

## Appendix E: In Case of Injury

If you have an EMERGENCY requiring police, fire, or ambulance, call 911 without delay.

If the injury involves a known chemical, reference the SDS for emergency procedures.

Once safe during an Emergency or during a Non-Emergency, contact Campus Security at (256) 233-8222. They will file an incident report. If the injury involves a known chemical, be prepared to provide the chemical name.

## Appendix F: Chemical Hazards Preparation Form

To be completed by LSC prior to the purchase of Blue chemicals at a level 3 or 4 (highly toxic, carcinogens, reproductive toxins, etc.), White chemicals at a level 2 or above (highly reactive, explosive, etc.), and Level 4 Red chemicals (can ignite at room temperature) as defined by the National Fire Protection Association (NFPA) not already present in the chemical inventory to insure proper facility safety, storage, and disposal.

**Chemical Hazards Preparation Form**

Chemical identified to be used:

Compatible with other chemicals?

\_\_\_\_\_  Yes  No  
 \_\_\_\_\_  Yes  No  
 \_\_\_\_\_  Yes  No

Replacement of incompatible or high hazard chemicals evaluated?  Yes  No**Hazard Category (Circle all Relevant)**

Corrosive Solid      Corrosive Liquid      Reactive      Volatile

Other: \_\_\_\_\_

**PPE – Personal Protection Equipment (Circle all Relevant)**Safety  
Glasses

Goggles

Lab Coat

Apron

Splash Shield

Respiratory

Gloves Required:      Yes / No      (Circle One)

If Yes, indicate specifications:

**Engineering Controls**

Use Fume Hood:      Yes / No      (Circle One)

Describe any dilution or small quantity requirements below:

Identify type of Fire Extinguishers required:

**Waste Disposal**

Does it require a Segregated Waste Container (i.e. Acids, Bases, Solvents, Solids)? Yes / No  
(Circle One)

If Yes, indicate specifications:

Can it be disposed of down the drain? Yes / No (Circle One)

Does it require a Chemical Garbage Can? Yes / No (Circle One)

If Yes, indicate specifications:

List any hazardous products, by products or wastes that may be created anytime during the use of the chemical identified above as well as the proper handling and disposal of those chemicals:

**Specific Safe Work Practices:**

[list the safe work practices expected to be used in each stage, if all the same just write once.]

**Specific Emergency Procedures:**

[especially important for chemicals that are incompatible with the usual spill kit or fire extinguishing materials.]



## Appendix G: Safety Shower and Eyewash Inspection Checklist

<b>The Eyewash and the Safety Shower Inspection Checklist</b>			
	Yes	No	N/A
<b>The eyewash station is checked weekly for the following:</b>			
Is each eyewash station free and clear for easy access?			
Does the safety alarm sound when activated?			
Is the water a clear non-turbid clarity color when in use?			
Is the flow rate a minimum of three gallons per minute (gpm)?			
Is the eyewash capable of operating a minimum of 15 minutes continuously?			
Will the eyewash come on immediately or within in one second or less after activation?			
Did the eyewash pull down door operate properly?			
Is the station clearly marked to distinguish it from other eyewashes by a tag?			
Is the tag properly dated when tested and up to date?			
Does the eyewash water flow remain on without the use of operator's hands?			
Is the eyewash station within 55 ft. or the 10 second rule from where work is being performed?			
<b>The Deluge Safety Shower is checked monthly for the following:</b>			
Is the safety shower free and clear for easy access?			
Does the safety alarm sound when activated?			
Is the water a clear non-turbid clarity color when in use?			
Is the flow rate a minimum of 30 gallons per minute (gpm)?			
Is the safety shower capable of operating a minimum of 15 minutes continuously?			
Will the safety shower come on immediately or within in one second or less after activation?			
Does the safety shower pull lever operate properly?			
Is the shower clearly marked to distinguish it from other showers by a tag?			
Is the tag properly dated when tested and up to date?			
Does the shower water flow remain on without the use of operator's hands?			
Is the safety shower within 55 ft. or the 10 second rule from where work is being performed?			

## Appendix H: Quarterly Laboratory Hood and Ventilation Inspection Checklist

### Quarterly Laboratory Hood and Ventilation Inspection Checklist

Date:	Yes	No	N/A
Is the exhaust fan working on the specific hood?			
Is the sash raised to the recommended height (16 inches) when checking/measuring hood?			
Check the digital readout for each hood after turning on and at the setting sash height.			
Is the hood clean of any spills or debris before turning on?			
Is there a fire extinguisher within 30 ft. of the hood?			
Is there a tag, properly dated, indicating the hood has been tested and shown to be drawing at least 100 LFPM within the past two years?			

Date:	Yes	No	N/A
Is the exhaust fan working on the specific hood?			
Is the sash raised to the recommended height (16 inches) when checking/measuring hood?			
Check the digital readout for each hood after turning on and at the setting sash height.			
Is the hood clean of any spills or debris before turning on?			
Is there a fire extinguisher within 30 ft. of the hood?			
Is there a tag, properly dated, indicating the hood has been tested and shown to be drawing at least 100 LFPM within the past two years?			

Date:	Yes	No	N/A
Is the exhaust fan working on the specific hood?			
Is the sash raised to the recommended height (16 inches) when checking/measuring hood?			
Check the digital readout for each hood after turning on and at the setting sash height.			
Is the hood clean of any spills or debris before turning on?			
Is there a fire extinguisher within 30 ft. of the hood?			
Is there a tag, properly dated, indicating the hood has been tested and shown to be drawing at least 100 LFPM within the past two years?			

## Appendix I: Laboratory Safety Checklist

Athens State utilizes the American Chemical Society Standard Laboratory Safety Checklist for annual lab inspections. Items not currently relevant to our labs are marked as n/a.

### Laboratory safety checklist

<b>Laboratory Information</b>
<b>Laboratory Director/Principal Investigator:</b>
<b>Location:</b>

<b>Laboratory Safety Checklist</b>	Yes	No	N/A	COMMENTS
<b>Training and Documentation</b>				
Current inventory maintained for all hazardous materials?				
Chemical Safety Data Sheets (SDS) maintained and readily available at all times employees are present?				
Workplace hazard assessment and certification completed?				
Employees know the location of chemical inventory, SDS and related reference material?				
Employees received institutional safety training (typical provided by Environmental Health and Safety office) and supplemental laboratory-specific safety training for the hazards present in the laboratory?				
Employees familiar with physical and health hazards of chemicals in work area?				
Employees able to describe how to detect the presence or release of hazardous materials?				
Employees know how to protect themselves and others from effects of hazardous materials?				
Employees familiar with Chemical Hygiene Plan (or equivalent)?				
<b>Spill and Emergency Planning</b>				
Employees familiar with the fire safety and building evacuation procedures including evacuation routes, nearest fire exits, fire alarm pull stations, and fire extinguishers?				
Emergency procedures and phone numbers clearly posted?				
First aid materials readily available?				
Are any "antidotes" or special first aid materials required and available (e.g., Hydrofluoric Acid = Calcium Gluconate)?				
Spill cleanup materials available and laboratory staff familiar with their use?				
Safety shower and eye wash accessible within 10 seconds and unobstructed (e.g., no closed doors)?				
Safety shower tested and documented within past year?				
Eye wash tested, flushed, and documented at least monthly?				
Fire alarm pull stations, strobes, speakers, and fire extinguishers unobstructed and visible?				
Exits clearly marked and unobstructed?				
<b>Personal Protection Clothing, Equipment and Engineering Controls</b>				
Personnel wear shoes that fully cover feet and full length clothing to protect legs?				
Long hair confined? Jewelry, lanyards and other loose articles are confined or removed?				
Lab coats of appropriate material available and worn?				
Appropriate gloves available and worn?				
Goggles, face shields, are of appropriate type and worn?				
Respirators available and used in the laboratory? If yes...				

Respirator training, fit test and medical evaluation completed for employees?				
Respirators cleaned, stored, and inspected regularly?				
Chemical hood available? If yes...				
Chemical hood free of clutter?				
Chemical hood inspected within last 12 months and capable of drawing at least 100 LFPM (or more if appropriate)?				
Chemical hoods equipped with air flow indicator?				
Perchloric acid operations conducted in specialized wash down chemical hoods?				
Biological Safety Cabinet available? If yes...				
Biological Safety Cabinet free of clutter and surfaces decontaminated?				
Biological Safety Cabinet certified within last 12 months?				
Mechanical pipetting used, no mouth suction?				
<b>Chemical Safety</b>				
Are chemicals used in this area? If yes...				
Appropriate labels are found on all hazardous chemical containers?				
Containers are in good condition (e.g., labels intact, metal cans free of rust) and closed when not in use?				
Containers properly segregated by hazard class (e.g., flammables away from oxidizers, acids separate from bases, incompatible acids separated)?				
Storage of chemicals above eye level is avoided?				
Flammable liquids stored in OSHA/NFPA approved cabinets and safety containers?				
Flammables liquids requiring refrigeration stored in either explosion proof or flammable resistant refrigerators and freezers (i.e., no regular refrigerators)?				
Ignition sources avoided when using/storing flammables?				
Corrosives stored in acid cabinets or other appropriate cabinets?				
Peroxide formers properly labeled and inventory tracked?				
Picric acid sufficiently wet?				
Large containers (4L or greater) stored near the floor?				
Bottle carriers or carts utilized when transporting hazardous chemicals between work areas?				
Proper signs delineate designated areas where high hazard chemicals are used?				
Designated area properly cleaned and decontaminated?				
<b>Biological Safety</b>				
Are biological materials used in this area? If yes...				
Biological materials are not stored in hallways in unlocked freezers or refrigerators.				
Biohazard signs are posted in labs handling infectious materials (BSL2 and higher).				
Disinfectants are on hand for sanitizing bench tops and treating spills.				
Biological safety cabinet(s) was certified within the last 12 months.				
<b>Ionizing and Non-Ionizing Radiation Safety</b>				
Are radioactive materials used in this area? If yes...				
Pure beta emitters (e.g., P-32, P-33, S-35, C-14)?				

Gamma and x-ray emitters (e.g., I-125, I-131, Cr-51, Na-22)?				
Volatile, gaseous radioisotopes (e.g., I125) or aerosol/dust generating laboratory operations (e.g., vacuum flasks)?				
Sealed sources?				
Irradiators?				
X-ray generating equipment (Electron Microscope, X-ray diffraction, Diagnostic X-ray, Computed Tomography)?				
Is the proper shielding available for the types of radioisotopes being used?				
Are appropriate meters available for radioactive material used and are meter(s) calibrated?				
Are radiation workers provided personal monitoring when required?				
Are all appropriate signs posted? (Radiation Labels, Notice to Employees and Emergency Procedures)				
Are all spaces and items which store, handle or use radioactive materials properly labeled with "Radioactive Material", "Radiation Area" or other applicable hazard warning labels?				
Are radioactive materials secured/locked against unauthorized access from nonauthorized users?				
Is non-ionizing radiation used in the area? If yes...				
Laser – Class 1?				
Laser – Class 2?				
Laser – Class 3a?				
Laser – Class 3b?				
Laser – Class 4?				
Personal protective equipment (e.g., eye protection) or shielding available specific to the Class lasers used?				
Laser hazard warning signage posted? (Laser, Electromagnetic)				
<b>Compressed and Cryogenic Gas Safety</b>				
Are compressed gas cylinders used in this area? If yes...				
Cylinders stored upright and properly secured at all times?				
Caps properly secured when cylinders are not in use?				
Regulators always used, proper regulators used for type gas, pressure bled when not in use?				
Cylinders in good condition and clearly marked?				
Flammables stored separately from oxidizers, toxics in secure area, etc.?				
Cylinders of flammable gases stored in ventilated enclosures?				
Cylinders moved on cylinder trucks with regulators removed and caps secured?				
Cylinders of toxic gases (e.g., NFPA health hazard 3 or 4 and 2) stored and used in continuously ventilated enclosures?				
Cryogenic gas cylinder pressure relief valves in proper working condition?				
Oxygen monitor available in areas with increased likelihood of oxygen deficient atmospheres?				
<b>Equipment and Physical Hazards Safety</b>				
Are equipment safety signs posted and in good condition?				
Are all guards and shields in place and secured?				



Are safe work practices (long hair tied back, no loose clothing, etc.) being adhered to by all equipment users?				
Is equipment in good repair with evidence of proper maintenance?				
Are electrical cords in good condition, out of travel paths, and free of any cracks or breaks in insulation?				
Is proper PPE available and being used by equipment operators?				
Is a tagging system in place to prevent use of damaged equipment?				
Is access to the equipment restricted?				
Have all users been trained to operate this equipment?				
Are any additional or new hazards present at or around the equipment?				
Have there been any modifications to the equipment?				
<b>General Laboratory Safety</b>				
Smoking, eating, and drinking prohibited in lab?				
Lab is maintained secure; door is locked when no one is in lab?				
Appropriate warning signs posted near lab entrance?				
Unobstructed aisles maintained at least 36 in. wide throughout?				
Lab benches and work areas free of clutter?				
Shelves and cabinets in good condition?				
Shelves have seismic restraints, e.g., lips or wires?				
Shelves and cabinets secured to walls?				
Storage above eye level minimized and items restrained from falling?				
Refrigerators and freezers clearly labeled "Not for Storage of Food for Human Consumption"?				
No storage of food or drink in refrigerators, unless dedicated for such and clearly labeled?				
<b>Waste Management</b>				
Wastes are not discarded via trash or drain disposal unless specifically approved by the appropriate institutional authority (e.g., Environmental Health and Safety)?				
Is hazardous chemical waste generated in this area? If yes...				
Chemical inventory management/ordering system in place and checked before ordering new chemicals?				
Waste containers tightly closed unless actively adding or removing waste?				
Waste storage area has communication equipment readily available?				
Satellite Accumulation Area (SAA) is located at or near where waste is generated?				
Maximum SAA storage capacity not exceeded (55-gallons per hazardous waste stream)?				
Waste containers are in good condition (not leaking, rusted, bulging or damaged)?				
Each container is marked with the words "Hazardous Waste"?				
Each container is marked with full chemical names identifying the contents stored inside (no abbreviations or formulas)?				
Waste containers are kept closed unless adding waste?				
Waste containers storing liquid hazardous waste at or near sinks and drains are stored within secondary containment?				

Secondary containment is in good condition (e.g., free of cracks, gaps and impervious to leaks)?				
Is sharps waste (e.g., needles, syringes, scalpel blades, or other instruments that has the potential to cut, puncture, or abrade skin) generated in this area? If yes...				
Sharps wastes are immediately discarded into proper puncture resistant containers?				
Sharps containers are readily available and managed appropriately (e.g., not overfilled)?				
Is biological waste generated in this area? If yes...				
Biological waste liquids decontaminated (if applicable) prior to drain disposal?				
Biological waste solids discarded as regulated medical waste and autoclaved or disinfected as appropriate?				
Is radioactive waste generated in this area? If yes...				
Is mixed waste (e.g., scintillation vials and any other radioactive and hazardous chemical waste mixture) generated in this area?				
Are the radioactive waste containers properly labeled?				

This file is excerpted from "Identifying and Evaluating Hazards in Research Laboratories: Guidelines developed by the Hazard Identification and Evaluation Task Force of the American Chemical Society's Committee on Chemical Safety".

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## Appendix J: Transfer of Chemicals

To be used upon transfer of Chemicals from one building to another.

### Chain of Custody Record

Building:			Contact Name:			POC:		
Date of Contact:			Phone #					
Work Order #								
#	Sample Description	Sample Date	Work requested	Quantity	Unit	Container	Liquid or Solid	
1								
2								
3								
4								
5								
6								
7								
8								
9								
10								
11								
12								
13								
14								
15								
Relinquished by:					Date/Time:			
Received by:					Date/Time:			

## Appendix K: Instructor Safety Form

To be filled out by instructors trained to teach students within a laboratory space and submitted to the CHO for filing. Dean should be updated with this information for provision to Campus Security or the Registrar when necessary.

## Science Laboratory Instructor Safety Form

As a lab instructor, you agree to follow and enforce all safety rules. Willful non-compliance will result in dismissal or suspension from the laboratory and you will not be allowed to use the laboratories in the future.

As a lab instructor, either as an adjunct or as an invited guest instructor, you agree to:

1. Abide by the Athens State Chemical Hygiene Plan (CHP). A copy of the CHP can be found in every lab and within the Athens State Policy Library.
2. Supervise the labs at all times. Unattended students, children, and nonservice animals are not allowed in the labs.
3. Make sure everything is clean and in order for the next instructor to use the space, including disinfection after microbiology experiments, switching off of unused equipment, and ensuring doors are closed and locked.
4. Review the Safety Rules for the Laboratory with each class you teach, ensure students sign copies before participating in laboratory activities, and submit the completed forms to the Laboratory Safety Coordinator.

The following are rules for instructors, students, and guests in all laboratories.

1. Eye protection is required at all times in the laboratory and where chemicals are stored and handled. Approved safety glasses must be worn. Contact lenses may not be worn in the laboratory.
2. Horseplay or other acts of carelessness are prohibited.
3. Unauthorized experiments are prohibited.
4. Eating and drinking are prohibited in the Laboratory areas.
5. Mouth suction should not be used to fill pipets.
6. Never work in the laboratory alone without supervision of a qualified laboratory instructor.
7. Confine long hair when in the laboratory.
8. Locate safety showers, fire extinguishers, first aid kits, and secondary exits.
9. Shoes (no sandals or opened toed shoes) must be worn in the laboratory.
10. Pants (to the ankle) must be worn in the laboratory.
11. Use proper protective equipment such as disposable gloves and aprons as appropriate.
12. Smoking in the laboratory is never permitted.
13. Chemicals should not be tasted.
14. Accidents or injuries requiring medical attention must be immediately reported to Campus Security.

15. Many, if not most accidents are caused by poor-housekeeping practices. Clean up as you work and keep your bench clear of extraneous backpacks, books, and other clutter.
16. Do not bring spouses, children, or friends with you to the laboratory.
17. Use proper disposal procedures for chemicals.
18. Read each experiment carefully and make a note of all safety instructions.
19. Review the MSDS for any chemical that you will be using in an experiment
20. Since the period of greatest susceptibility to a fetus is believed to be in the first 8-12 weeks of pregnancy, which includes a period when a woman may not know she is pregnant, women of child bearing potential should request from their laboratory supervisor information on the possible fetal risk associated with their laboratory program. Information on possible fetal risk of chemical usage can also be found in the MSDS of the material used.
21. I do hereby agree and consent that if I suffer discomfort, illness, harm or injury while participating in lab activities, that Athens State University's agents, officers, or employees, while they have no obligation or responsibility to do so, may provide or administer first aid to me (including but not limited to the application of antiseptics, bandages, splints, or other over the counter medications) or seek emergency medical treatment for me, and in such event, I do hereby (a) assume the financial responsibility for any costs associated with my health care and acknowledge that I am solely responsible for such costs, and (b) release, acquit, indemnify, hold harmless, and forever discharge Athens State University (including its officers, agents, employees, sponsors, and volunteers), from and against any and all actions and claims for all types of injuries, damages, costs, and compensation, that now exist or may hereafter arising from or relating to the same, including but not limited to claims related to alleged negligence of the released persons or entities.

By signing below, you acknowledge you have read and understand these procedures and agree to abide by them.

Instructor's name \_\_\_\_\_

Instructor's signature \_\_\_\_\_

Instructor's Number, if relevant \_\_\_\_\_

Course Date \_\_\_\_\_