ERNEST G. WELCH SCHOOL OF ART AND DESIGN

CLASSROOM - STUDIO SAFETY PROGRAM MANUAL

Finished: March, 2012

Revised: ____________________

Signatures:

______________________________
Director, Ernest G. Welch School of Art and Design

______________________________
Georgia State University Laboratory Safety Committee
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I Introduction

Georgia State University is committed to providing a safe and healthful environment for its faculty, staff, students and visitors and managing the University in an environmentally sensitive and responsible manner. We further recognize an obligation to demonstrate safety and environmental leadership by maintaining the highest standards and serving as an example to our students as well as the community at large.

The goal of the Ernest G. Welch, School of Art and Design Classroom - Studio Safety Manual is to minimize the risk of injury or illness to employees and students by ensuring that they have the training, information, support and equipment needed to work safely in the Art and Design classrooms - studios. Please note that the absence of a particular issue or procedure from this Manual does not necessarily indicate that the procedure or operation is safe. It is not possible to address all situations that may be encountered in Classroom – Studio settings. It is the responsibility of Department Chair, Faculty, and studio personnel to identify and address outstanding classroom – studio safety issues. This manual will be reviewed annually in April in conjunction with Earth Day. As changes are made to this Manual updated versions will be available electronically on the Office of Research Integrity website (http://www.gsu.edu/research/index.html). Additionally, each Vice President, Dean, and Department Chair will be sent a notification email of the updated Manual to forward to all of the faculty and staff.

The Georgia State University, Ernest G. Welch School of Art & Design Classroom – Studio Safety Manual outlines safety responsibilities and training requirements to ensure individual and institutional compliance with relevant environmental health and safety laws, regulations, policies, and guidelines. This Classroom - Studio Safety Manual includes recommendations for good classroom - studio practices to serve as a useful resource and to assist classrooms - studios in designing their own site specific classroom – studio procedures to meet these requirements.

The purpose of this Safety Manual is to promote safety awareness and encourage safe work practices in the classrooms - studios. These are just basic guidelines; they should serve as a reminder of things you should be doing make your areas and others safer. Although these basic guidelines are applicable to all teaching and academic classrooms - studios, your classroom - studio may require more specialized rules that apply to specific materials and equipment. Please see your Studio Supervisor or Professor for more information before beginning class work in the classroom - studio.

To assure a safe learning environment, it is essential for all involved in the Art – Studio instruction program to develop a positive approach to a safe and healthful environment in the classroom - studio setting. Safety and the encouragement of safety rules and requirements within the classroom – studios are the responsibility of the department
head, professor, instructor, teaching assistant and student—each assuming his/her share.

Safety and health should be an integral part of the planning, preparation, and implementation of any Art – Studio program. Safety and health considerations are as important as any other materials taught in a classroom – studio curricula. It is essential that the students are taught what can go wrong, how to prevent such events from occurring, and what to do in case of an emergency.

II Departmental Classroom – Studio Accident / Incident Response and Reporting

A. Initial Notification

FOR ANY EMERGENCY – Georgia State University Police Department - 404-413-3333

Hazardous Chemical Incident: 404-413-3540, 404-413-3551
Chemical Waste: 404-413-3535, 404-413-3568
Biological Safety: 404-413-3510, 404-379-2940
Georgia State University – Environmental Programs - 404-413-3551
Facilities Management Operations Center- 404-413-0700
Student Accident – Injury – Safety & Risk Management – 404-413-9549
Employee Accident – Injury – Safety & Risk Management – 404-413-9545
Georgia State University – Occupational Health and Safety Officer – 404-413-9545
Georgia State University – Fire Safety Officer & Emergency Management – 404-413-0776

All notifications must include: Date, time, location, what happened, how it happened, what was done to solve the problem and / or required paperwork

B. After Initial Notification – Emergency Stabilization:

Provide information and/or copies of all paperwork to:
- Departmental Chair: __________________________
- Faculty assigned to the facility where the incident occurred.
- Business Manager, School of Art and Design – 404-413-5226

C. Emergency Procedures - Ernest G. Welch School of Art & Design – Specific

For any emergency, including fire, explosions, accidents, and medical emergencies, dial 404-413-3333, or 404-413-3333 from any Georgia State University desk telephone. Georgia State University Police personnel will respond, determine whether additional assistance is needed and alert others who can help.
Fire Emergencies

If your clothing catches fire, drop to the floor and roll to smother the fire, drop to the floor and roll to smother the fire. If a co-worker's clothing catches fire, knock the person to the floor and roll him or her to smother the flames. Most classrooms – studios will have fire blankets that can be used to help put out clothing fires.

In the event of any fire, Georgia State University Police should be notified immediately at 404-413-3333 AND the following actions are recommended:

- Remove persons in immediate danger and close all doors to the affected area, to prevent the fire's spread to other areas.
- Activate the fire alarm and call Public Safety (Police) at 404-413-3333), and tell them where the fire is located and so they can contact the local Fire Department, quickly.
- Calmly notify other people in the area.
- Attempt to extinguish the fire, only if you have been trained on how to use a fire extinguisher and you can do so without endangering yourself or others.
  - If you have been trained in the use of a fire extinguisher, fight the fire from a position where you can escape, only if you are confident that you will be successful. Small fires can often be extinguished.
  - A fire contained in a small vessel can usually be suffocated by covering the vessel with a lid of some sort. Make sure the covering material will not catch fire.
- Follow established fire safety and evacuation procedures for your area.
- Evacuate the building – In other words: GET OUT OF THE BUILDING!
- Stay outside until you are told it is safe to return either by Police or the Fire Department, or the alarm stops sounding.

Emergency Response Actions - Chemical Exposures
The following procedures should be followed in the event of chemical exposure. In all cases, the incident should be reported to the department manager, regardless of severity.

Skin Contact
Immediately flush with water for no less than fifteen minutes. Remove any jewelry or clothing that has become contaminated to facilitate removal of any residual material. For some clothing, it may be beneficial to cut garments off to prevent further skin/eye contamination.

If immediate medical attention is needed, call 9- 911 for an ambulance and
transportation to a local emergency facility. Be prepared to explain carefully what chemicals were involved. A hard copy Material Safety Data Sheet (MSDS), for each chemical to which the injured was exposed, should accompany the injured person so that medical personnel can correctly determine what procedures to follow and to watch for any delayed effects that should be expected.

**Chemicals in Eyes**
Flush eye(s) with water for at least fifteen minutes. The eyes may have to be forcibly held open to wash, and the eyeballs must be rotated so all surface area is rinsed. The use of an eye wash fountain is desirable so hands are free to hold the eyes open.

Remove contact lenses while rinsing. Do not attempt to rinse and reinsert contact lenses.

*Seek medical attention no matter the severity or apparent lack of severity.*
If ambulance transport to an emergency room is needed, call 9-911 from a University telephone. Be prepared to explain carefully what chemicals were involved. A hard copy Material Safety Data Sheet (MSDS), for each chemical to which the injured was exposed, should accompany the injured person so that medical personnel can correctly determine what procedures to follow and to watch for any delayed effects that should be expected.

**Chemical Inhalation**
Close containers, open windows or otherwise increase ventilation, and / or move to fresh air.

If symptoms, such as headaches, nose or throat irritation, dizziness, or drowsiness persist, seek medical attention.

If ambulance transport to a local emergency room is needed, call 9-911 from a University telephone. Be prepared to explain carefully what chemicals were involved. A hard copy Material Safety Data Sheet (MSDS), for each chemical to which the injured was exposed, should accompany the injured person so that medical personnel can correctly determine what procedures to follow and to watch for any delayed effects that should be expected.

**Accidental Ingestion of Chemicals**
Immediately get to either a local emergency room or contact Poison Control Center at: [http://www.georgiapoisoncenter.org/home.html](http://www.georgiapoisoncenter.org/home.html) - A chat online service is available or call: **Toll free at 1-800-222-1222 or via a local number 404-616-9000.**

Do not induce vomiting unless directed to do so by a health care provider. Explain carefully what chemicals were involved.

Have the appropriate Material Safety Data Sheet (MSDS) available to help Poison
Control Toxicologists correctly determine what health effects are expected, including delayed effects.

**Accidental Injection of Chemicals / Hazardous Materials**
Wash the area with soap and water.

Seek medical attention, if necessary. Have the appropriate Material Safety Data Sheet (MSDS) available and take a copy with you so medical personnel can accurately and quickly determine what health effects are expected, including delayed effects.

### III Responsibilities

**A. Laboratory Safety Committee (LSC)**

Georgia State University’s Laboratory Safety Committee (LSC) serves to advise the President and Provost on policies, procedures, and issues regarding Laboratory Health and Safety. Other responsibilities of the LSC include:

1. Establish and review laboratory safety policies and procedures which are designed to:
   a. Maintain compliance with Local, State, and Federal regulations regarding laboratory safety and the purchase, transportation, use, handling, storage and disposal of all hazardous materials.
   b. Protect and optimize safety for all faculty, staff, students, visitors and members of the public from hazardous materials.
   c. Establish procedures for monitoring the purchase, use, storage and disposal of hazardous materials.

2. Review and approve Department-Specific Laboratory Safety Plans (DSLSP’s)

3. Review and provide advise on corrective actions recommended by the Laboratory Safety Staff from the Office of Research Integrity (ORI).

4. Recommend training programs on laboratory safety practices and procedures that will result in faculty, staff and students having a continuing awareness of safe laboratory practices and proper hazardous materials use, storage, and disposal.

5. Evaluate the various programs involved with laboratory safety compliance on an annual basis. A member of the Committee will be selected by the Committee Chair to perform the assessment. If another recognized committee is charged to annually assess a specific program (ie. Radiation Safety), the Chair may use that committee’s assessment in lieu of their own. Results of all assessments will be made available to the Associate Vice President for Research Integrity, all members of the Committee, and the respective Vice President, Dean, and Department Chair.
6. Current Committee Members:

Dr. Markus Germann (Chemistry) – Chair
Dr. Eric Gilbert (Biology)
Mr. Abdul Momen (Facilities)
Dr. Gordon Warren (Physical Therapy)
Dr. Nikolaus Dietz (Physics)
Dr. Donald Edwards (Neuroscience Institute)
Dr. Pedro Vasquez (Chemistry)
Mr. Jamar Simmons (Chemical Safety Specialist)
Mr. Richard J. Muller Jr. (Senior Biosafety Officer)

B. College Dean/Departmental Chairs

College Deans and Department Chairs have the following responsibilities related to Laboratory Safety:

1. Ensure that prior to the initiation of research, each Principal Investigator, Faculty and/or Instructor using hazardous materials implements the University Laboratory Safety Manual and the Department-Specific Laboratory Safety Plan (DSLSP) within their respective laboratory space(s).

2. Ensure that all Principal Investigators, Faculty, Instructors, Laboratory Personnel, students and other authorized personnel allowed access to the laboratories where hazardous materials are used have received all necessary and required training in laboratory safety policies and procedures.

3. Ensure that appropriate facilities and safety equipment are available for research and teaching activities involving hazardous materials.

4. Provide leadership and support of laboratory safety.

C. Principle Investigators (PI) – Faculty / Instructors

A Principal Investigator (PI) is a faculty member (assistant professor, associate professor, professor, or instructor including adjunct faculty), a research professional, an academic professional, or laboratory director or coordinator who is associated with or provides guidance to a laboratory or laboratories using hazardous materials.

Graduate students and postdoctoral associates will not be considered a PI except under special circumstances and only at the discretion of the Departmental Chair or appropriate administrator.

[10]
Some disciplines do not have a PI, but rather a director, manager or unit supervisor that provides oversight of operations. Those individuals or positions also will be considered as a PI for all intents and purposes of this Manual.

Responsibilities of the PI related to laboratory safety include, but are not limited to ensuring that all laboratory personnel have the proper training before allowing them to work in a laboratory using hazardous materials. Training shall include (but not be limited to) ensuring that job specific safety protocols for laboratory equipment and hazardous materials are written down, posted and followed.

Professors / Instructors have an obligation to instruct their students in the basic safety practices required in classroom - studio settings. They also have an obligation to instruct them in the basic principles of health hazards that are found in most university level classroom – studio settings. Professors / Instructors must provide safety information and training to the students for every stage of project planning and be there to observe, supervise, instruct, and correct during the project duration. Professors / Instructors play the most important role in ensuring a safe and healthful learning environment for the students. The ideal time to impress on students’ minds the need for caution and preparation is before and while they are working with chemicals in the classroom – studio setting.

Professors / Instructors are expected to be proactive in every aspect of university classroom – studio safety by setting the example and wearing personal protective equipment; following and encouraging adherence to the established safety rules, procedures and practices; and demonstrating safety behavior so as to promote a culture of safety within the classroom – studio setting.

Records Retention

The Principle Investigator (PI) – faculty member responsible for the studio - classroom, is responsible for providing resources and opportunities to complete training.

The Principle Investigator (PI) – faculty member shall provide access to the Department-Specific Laboratory Safety Plan (DSLSP).

All laboratories using hazardous materials shall develop a Laboratory-Specific Safety Plan and Standard Operating Procedures in accordance with the respective Departmental Plan.

The Principle Investigator (PI) – faculty member is responsible for maintaining training documentation as it applies to lab area activity. Much of the following can be accomplished by requiring the lab personnel to maintain training records. See the Office of Research Integrity website (http://spidey1dev.gsu.edu/research/environmental_programs.html ) for details on training requirements.
a. **Basic Right to Know Training** - [http://www.usg.edu/ehs/training/rtkbasic/](http://www.usg.edu/ehs/training/rtkbasic/)

This program is designed to educate USG employees on the importance and benefits of properly recognizing and safely working with hazardous materials. A printable certificate of completion is available.

b. **Chemical-Specific Right to Know Training** - [http://www.usg.edu/ehs/training/chemical/](http://www.usg.edu/ehs/training/chemical/)

This program is designed to provide safety guidelines for commonly used chemicals in the work place. A printable certificate of completion is available.

c. **Department-Specific Safety Plan Training** – This training should be done by the Department.

d. **Specific Laboratory Equipment and Apparatus Training** – This training should be done within the specific Studio – Classroom.

e. **Hazardous Waste Training** - [http://www.usg.edu/ehs/training/hazwaste/](http://www.usg.edu/ehs/training/hazwaste/)

This program is designed to educate employees on the importance and benefits of properly identifying, handling, and disposing of hazardous wastes. A printable certificate of completion is available.

f. **Bloodborne Pathogens Training** - [http://www.usg.edu/ehs/training/pathogens/](http://www.usg.edu/ehs/training/pathogens/)

This program is designed to provide a basic understanding of bloodborne pathogens, common modes of transmission, and methods of preventing exposure. A printable certificate of completion is available.

3. Laboratory personnel should be able to adequately demonstrate ability to access records and the Safety Manual in a reasonable amount of time.

**Ensuring Appropriate Art – Studio Conduct**

Faculty – Instructors should be a model for good safety conduct for students to follow.

- Make sure you and your staff and students are wearing the appropriate personal protective equipment (i.e., chemical splash goggles, laboratory aprons or coats, and gloves).
- Enforce all safety rules and procedures at all times.
- Never leave students unsupervised in the Studio-Classroom.
- Never allow unauthorized visitors to enter the Studio-Classroom.
- Never allow students to take chemicals out of the Studio-Classroom.
- Never permit smoking, food, beverages, or gum in the Studio-Classroom.
D. **Studio - Classroom Personnel**

Studio - Classroom Personnel can include faculty members, research professionals, Doctoral and post-doctoral researchers, research assistants, academic professionals, laboratory directors, laboratory assistants, or students who are associated with a laboratory or laboratories using hazardous materials.

Responsibilities of Studio - Classroom Personnel related to laboratory safety include, but are not limited to:

1. Obtain training on protocols, hazard controls, specific hazards and emergency procedures before working in a Studio - Classroom or facility using hazardous materials.

2. Learn all job specific safety protocols for Studio - Classroom equipment and hazardous materials within the laboratory.

3. Complete all safety and compliance training that is required by University policy

4. Maintain current training records (i.e. keep the certificate within reach and remember to perform annual training in accordance to the Manual).

5. Ensure that all applicable safety and compliance records are maintained as required by Federal, State and Local regulations and University policy.

6. Comply with all policies and regulations regarding the proper procurement, storage, use, transportation and disposal of all hazardous materials being used.

7. Immediately inform the supervisor of any hazardous situation or situation that has the potential to become hazardous.

8. Follow all Studio - Classroom protocols and standard operating procedures.

9. Do not proceed with a process unless safety is addressed and is completely understood.

10. If personnel observe issues that pose a risk and have not been addressed, the supervisor and/or PI are to bring it to the attention of the Department Chair and Office of Research Integrity (ORI).

E. **Vice President for Research/Office of Research Integrity (ORI)**

The Georgia State University Vice President for Research/Office of Research Integrity (ORI) provides and consultation to the LSC in the establishment of University policies and procedures for laboratories using hazardous materials. ORI will also advise and
assist Department Chairs and Principal Investigators in complying with the policies and procedures of the University Laboratory Safety Manual.

Other responsibilities of ORI related to Laboratory Safety include, but are not limited to:

1. Assist Departments and laboratories in developing Department-Specific Laboratory Safety Plans (DSSP) for approval by LSC for the use, storage, and disposal of hazardous materials and to assist with the training of laboratory workers, ensuring that those plans are compatible with University policy.

2. Conduct routine scheduled evaluations of University laboratories for compliance with the policies and procedures of the University Laboratory Safety Manual.

3. Advise, as appropriate, Vice Presidents, College Deans, Department Chairs, Principal Investigators, and/or the LSC of issues found in individual laboratories.

4. Provide and/or facilitate testing for proper operation of safety equipment in laboratories where hazardous materials are present (e.g., safety showers, chemical fume hoods, etc.).

5. Provide consultation on the safe design of laboratories utilizing hazardous materials and their associated safety equipment.

6. Develop and present educational and training opportunities related to laboratory safety.

7. Respond to emergencies involving hazardous materials, providing guidance, consultation, and appropriate assistance.

8. Assist with and facilitate the proper disposal of hazardous wastes in compliance with existing regulations.

9. Assist in the development and maintenance of a hazardous materials inventory system.

F. Students

Students should be encouraged to develop attitudes towards safety and acquire habits of assessing hazards and risks when they are in the early stages of their education. The University Classroom – Studio setting provides an opportunity to instill good attitudes and habits by allowing students to observe and select appropriate practices and perform projects safely. Safety and health training lays the foundation for acquiring these skills and can carry over to the workplace when the students graduate. Students should think through implications and risks of experiments that they observe or conduct in order to learn that safe procedures are part of the way art must be done. Student motivation in any area of education is a critical factor in the learning process.
Emphasizing the importance of safety and health considerations by devoting substantial class time to these areas should help.

The current popular preoccupation with matters of industrial safety and health may also serve as motivation. Students may find a discussion of toxicology interesting, informative, and beneficial. The possibilities for working this material into the art classroom – studio curriculum are innumerable and limited only by the imagination of the Professor / Instructor.

G. Classroom – Studio Safety Responsibilities

The ultimate responsibility for health and safety within the classroom - studio lies with each individual who works in the classroom – studio. However, it is the responsibility of the faculty and classroom - studio supervisors to ensure that employees (including visitors, volunteers, temporary employees, students and student employees) have received all appropriate training, and have been provided with all the necessary information to work safely in the classroom - studio under their control.

Faculty and classroom – studio supervisors have numerous resources at their disposal for helping to ensure a safe and healthy classroom - studio that is compliant with state and federal regulations.

H. Upkeep of Classroom - Studio Safety Equipment

Regular self-conducted inspections of safety and first aid equipment should be conducted by faculty and or staff. All Classrooms – Studios should have at least a minimally stocked first aid kit and basic safety/emergency equipment.

Refer to Appendix A for suggestions as to appropriate contents of a First Aid Kit.

Appendix B contains a listing of minimum basic safety / emergency equipment that should be readily available in most all Classroom – Studio areas, especially those handling, using and/or storing hazardous materials.

Record the inspection date and the person who conducted the inspection and place it on the piece of equipment.

The Departmental Administrator should be notified, in writing, if a hazardous or possibly hazardous condition (e.g., malfunctioning safety equipment or chemical hazard) is identified in the classroom – studio and follow through on the status until the hazard is abated.

No one should ever use, or allow, defective equipment to be used. The defective piece of equipment should either be repaired or discarded.
IV. GEORGIA STATE UNIVERSITY BASIC SAFETY POLICIES AND PROCEDURES

The following laboratory safety procedures must be followed by all University personnel where activities involve the storage and use of hazardous materials in a laboratory. A **hazardous material** is any item or agent (biological, chemical, physical) which has the potential to cause harm to humans, animals, or the environment, either by itself or through interaction with other factors.

**Toxicity** is the capability of a chemical to produce injury. Almost any substance is toxic when taken in doses exceeding the “tolerable limits”. **Hazard** is the probability that an injury will occur or rather the prospect that an individual will receive a toxic dose. It is incumbent upon the hazardous materials user to know the relative hazard of the materials in use.

Many items sold as consumer goods, office products, household utility products and cleaning supplies are not considered “hazardous”. These products are exempted from certain labeling requirements; however, since Georgia State is classified as a Large Quantity Generator of hazardous waste the University is required to manage these and all other hazardous chemicals for proper disposal.

With regard to this Manual, a **Laboratory** is defined as any area where hazardous materials may be stored or used as a part of teaching and research and may include, but is not limited to:

Science Laboratories - Chemistry, Biology, Psychology, Neuroscience, etc.

Fine Art Studios - Painting, Sculpture, Ceramics, Wood/Metal Working, Jewelry, Textiles, etc.

A Glossary of terms is included in **Appendix C** of this Manual.

A. **Hazardous Material Procurement, Inventory and Storage**

1. **Procurement and Delivery**

The Principal Investigator (PI), faculty member or a designee will perform the procurement and schedule the delivery of hazardous materials as defined in Departmental Classroom – Studio Safety Plan.

2. **Inventory**

The Office of Research Integrity will facilitate an inventory system for chemicals that complies with the requirements of the Georgia State University Right to Know Program. The Department Chair is responsible for ensuring that all faculty and staff within their
department comply with the requirements of the Right to Know Program. Hazardous chemical inventories are to be reported to the University’s Right to Know Coordinator biannually.

3. Storage

It is suggested that departments consider applying the storage requirements to the highest risk chemicals first, and then ensure all newly installed casework and shelving meet the following information and that contained in Appendix D.

General Chemical Storage Information:

a. Chemicals shall be segregated by compatibility (acids, bases, flammable, reactives requiring separate and special storage, highly toxic compounds and general non-hazardous material storage shall be separated from one another.)

b. Use the higher shelves for containers of non-hazardous materials or for general supplies.

c. Shelves used for the storage of hazardous materials should be:
   
   - Well anchored;
   - Made of or covered with a chemical resistant material; and,
   - Equipped with a protective lip.

d. Do not use work areas for long term storage.

e. Do not store glass chemical containers on the floor.

f. All incoming containers of chemicals must have appropriate labels that are not removed or defaced. Appendix E contains information on appropriate labeling of chemicals / hazardous materials.

Storage of Flammable Liquids

The total allowable quantities of flammable and combustible liquids (including waste) in research and teaching laboratories shall be governed by Georgia Fire Codes as denoted in the National Fire Protection Association - NFPA 45 (Standard on Fire Protection for Laboratories Using Chemicals).

a. Twenty gallons (76 liters) are allowed per 100 square feet of a properly fire-separated laboratory unit. Ten gallons (38 liters) are allowed per 100 square feet in non-
fire-separated lab units. This volume includes flammable liquids stored in safety cans and proper storage cabinets.

b. Up to 35 gallons (132 liters) of flammable solvents which are outside of flammable storage cabinets are allowed in a laboratory. Of this amount, 25 gallons (95 liters) must be contained in 2 gallon or smaller approved safety cans. The remaining 10 gallons (38 liters) may be kept in other containers such as the original 5 gallon (20 liter) shipping container, glassware and squeeze bottles.

c. No more than three 60 gallon (227 liter) capacity cabinets are allowed per laboratory unit.

d. Quantities allowed within an instructional laboratory unit should be restricted to ½ that allowed in a research laboratory unit.

e. Dispensing of flammable liquids from containers larger than 5 gallon (20 liter) capacity should:

   • Only be performed in a proper dispensing area per NFPA 30.
   • Be separated from the laboratory work area, per NFPA 45.
   • Be equipped with explosion proof lighting and outlets.
   • Have mechanically operated explosion proof ventilation with a fresh air supply. The minimum air flow is one cubic foot per minute for each square foot of floor space.

There are specific guidelines in NFPA 30 for five different types of flammable storage areas outside the laboratory: inside storage room, cutoff room, separate outside storage buildings, attached buildings and flammable liquid warehouses. If it is discovered that there is a need or requirement for one of these facilities, the Office of Research Integrity and the University Fire Safety Officer shall be contacted. Facility requirements will be dependent on the quantities of chemicals to be stored and the volume and frequency of their use.

No containers for dispensing or use of larger than 5 gallon (20 liter) capacity are allowed inside the laboratory area.

Storage of flammable liquids in refrigerators not specifically designed and approved for that use by a recognized testing agency, shall be strictly prohibited. Refrigerators must be UL or Factory Mutual approved for the storage of flammable liquids.
Storage of Pressurized Gases

Remember that there are many pressurized gases that, while not toxic, are simple asphyxiants (i.e. nitrogen, carbon dioxide, helium, etc.). Frequently these are often overlooked. Consider that a cylinder closet, while not an OSHA-defined confined space, is a virtual confined space until it is ventilated prior to entry.

a. Storage of pressurized gas cylinders shall comply with Georgia Fire code as given in NFPA 45.

b. Cylinders shall be secured in an upright position at all times and valve caps shall be in place except when cylinders are in use.

c. Cylinders shall be dated upon receipt with a permanent marker on the outside of the cylinder. No cylinder shall be kept beyond its retention period.

d. Liquefied gases shall be stored in an upright position.

e. A racked storage area shall be provided for pickup and delivery of gas cylinders.

f. All cylinders should be labeled “Empty” when gas pressure equals ambient pressure.

g. Empty cylinders shall be segregated from cylinders which are full or in service.

h. All personnel who will be working in areas where compressed gases are used or stored shall receive instruction in methods of safe cylinder handling, emergency and evacuation procedures, the use of appropriate personal protective equipment, and steps to be taken in the event of a leak or fire in an adjacent area.

i. Cylinders and other containers shall not be stored near elevators, ventilating systems, or other openings through which gas may spread to other parts of a building if a leak should occur.

j. Suitable equipment shall be available for moving cylinders and other portable containers. Hand trucks shall be equipped with a clamp or chain to secure the container in place or they shall be specifically designed for container handling.

k. Always turn off gas cylinders at the main valve stem and never hit a gas cylinder with a metal instrument in an attempt to open or close the valve.

l. Cylinders shall be inspected regularly for corrosion or leaks. In case of a leak, the cylinder shall be removed promptly and in accordance with manufacturer’s recommendations.
Storage of Flammable and Oxidizing Gases

a. All areas where oxidizing gases are stored shall be identified with a sign stating the chemical name and the hazard associated with the gases which are being stored.

b. Flammable gases must be separated a minimum of 20 ft. from oxidizing gases or a noncombustible barrier >5 ft. high with a fire resistance of ½ hour shall be constructed between the gases.

c. Flammable gases must not be stored or used near open flames or hot surfaces. As with all flammable chemicals, flammable gases are to be stored in accordance with University policy.

d. Flammable aerosols are in pressurized containers that may rupture when exposed to fire. As with flammable liquids, these should be stored in a flammable storage cabinet.

Toxic Gases

a. Any gas with a Health Hazard (HH) rating of 3 or 4 must be kept in a continuously mechanically ventilated enclosure. Refer to Appendix E for an explanation of Health Hazard ratings.

b. No more than three cylinders with HH ratings of 3 or 4 shall be stored in a ventilated enclosure

Acids and Bases

One issue to consider when procuring corrosives is the actual use of that chemical(s) in the period of one year.

i. Acids shall be separated from:

(a) Caustics and from active metals such as sodium, magnesium, and potassium.

(b) Chemicals that can generate toxic gases on contact, such as sodium cyanide and iron sulfide.

ii. Large bottles of acids shall be stored on lower shelves or in acid cabinets.

iii. Oxidizing acids (nitric, perchloric) shall be separated from:

(a) Organic acids

(b) Flammables
(c) Combustible materials

iv. Separate Nitric and Perchloric acids from other acids. This may be accomplished by placement in an unbreakable chemical resistant carrier.
v. Mild acids and bases (such as citric acid and sodium carbonate) may be stored with other low-hazard reagents.

vi. Opened containers of acids and bases should be stored in a chemical resistant secondary container unless stored in an approved acid cabinet.

vii. **Add acid to water. Never add water to acid.**

**g. Peroxide-forming Chemicals**

Peroxide-forming chemicals shall:

(a) Be stored in airtight containers in a dark, cool, and dry place.

(b) Be labeled with the date received and date opened

(c) Used up or disposed of on or before the recommended storage time has expired as indicated by the manufacturer or the expiration date on the container.

**h. Water-Reactive Chemicals**

Water-reactive chemicals shall be kept in a cool and dry place. Metal specific Class D extinguishers shall be made available in laboratories where one pound or greater of water-reactive materials are used or stored.

**i. Fire Extinguishers**

Fire extinguishers may be recharged, replaced or upgraded to a specific use by calling the phone number on the yellow hang tag which is usually zip-tied to the pull pin.

**j. Oxidizing Chemicals**

Oxidizers shall be stored away from:

(a) Flammable agents

(b) Combustible agents

(c) Reducing agents (zinc, alkaline metals)

**k. Toxic Chemicals**
Toxic chemicals shall be stored according to the nature of the chemical, with appropriate warnings and security employed.

V. Ernest G. Welch School of Art and Design Basic Classroom – Studio Safety

Safety and Emergency Procedures - General

- Everyone using the classroom – studio should be informed about the location and use of all safety and emergency equipment prior to any studio activity.
- Prior planning should be done so as to identify, and develop the necessary safety procedures needed in the event of an emergency/accident.
- Everyone using the classroom – studio should be provided with verbal and written safety procedures to follow in the event of an emergency/accident.
- Everyone using the classroom – studio should know the location of and how to use the cut-off switches and valves for the water, gas, and electricity in the studio.
- Everyone using the classroom – studio should know the location of and how to use all safety and emergency equipment (i.e., safety shower, eyewash, first-aid kit, fire blanket, fire extinguishers and equipment shut offs - breakers).
- Emergency phone numbers and instructions should be posted in prominent place in all studios.
- Regular safety and evacuation drills should be conducted.
- Students should have detailed explanations of the consequences of violating safety rules and procedures.
- A Right To Know Poster should be hung in every classroom – studio. Appendix F contains this mandatory, State of Georgia, poster.

- A regular inventory of chemicals should be conducted. Containers should be inspected for integrity and appropriate labeling. Appendix E contains information on labeling requirements. Appendix E also contains information on how to label containers of hazardous materials that are not in their original containers.
- Material Safety Data Sheets (MSDS’) should be readily available for each chemical / hazardous material stored, or used within the classroom – studio.
- Material Safety Data Sheets (MSDS’) should be updated at least every two years, or each time the chemical / hazardous material is re-ordered.
- Update the chemical inventory, and submit it to the University Right To Know Coordinator, at least twice per year as required by Georgia’s Right To Know Law.

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• Do not store food and drink with any chemicals.

• Do not store chemicals on the lab bench, on the floor, or in the classroom - studio chemical hood.

• Ensure chemicals not in use are stored in a locked facility with limited access.

• Know the storage, handling, and disposal requirements for each chemical used. Appendix D - Storage of Chemicals contains minimum criteria for storage of hazardous materials.

• Make certain chemicals are disposed of properly. Consult the label and the Material Safety Data Sheet for disposal information and always follow appropriate chemical disposal regulations, according to Georgia State University’s Waste Disposal Protocols.

Preparing for Art – Studio Activities – Faculty

• Before each activity in the classroom - studio, weigh the potential risk factors against the educational value.

• Have an understanding of all the potential hazards of the materials, the process, and the equipment involved in every classroom - studio activity.

• Inspect all equipment/apparatus in the classroom - studio before use.

• Before entering the classroom - studio, instruct students on all laboratory procedures that will be conducted.

• Discuss all safety concerns and potential hazards related to the classroom - studio work that students will be performing before starting the work.

It is recommended that this information be documented in all classroom - studio handouts.

Expectations For Students

Life threatening injuries can happen in the classroom - studio. For that reason, students need to be informed of the correct way to act and things to do in the classroom – studio.
The following information may be used as a safety checklist and may also serve as a handout to students to acquaint them with the safety do’s and don’ts in the classroom - studio.

5. **Student Conduct**

- Students are expected to not engage in practical jokes or boisterous conduct in the classroom - studio.
- Student are expected to never run in the classroom - studio.
- The use of personal audio or video equipment is prohibited in the classroom - studio.
- The performance of unauthorized activities is strictly forbidden.
- Students are expected not to sit on classroom - studio benches/tables/counters.

6. **General Classroom – Studio Procedures for Students**

- Know emergency procedures.
- Never work in the classroom - studio without the supervision of a professor, instructor or teaching assistant.
- Always perform the assignments or work precisely as directed by the professor, instructor or teaching assistant.
- Immediately report any spills, accidents, or injuries to the professor, instructor or teaching assistant.
- Never leave projects/assignment while in progress.
- Never attempt to catch a falling object.
- Be careful when handling hot items and apparatus in the classroom - studio. Hot glassware, tools or other items looks just like cold glassware, tools or other items.
- Never point the open end of a vessel containing a substance at yourself or others.
- Make sure that there are no flammable solvents are in the surrounding area when lighting a flame.
• Do not leave hot plates, open flames, irons, stoves, washers, dryers, saws or other potentially dangerous classroom - studio equipment unattended while in operation.

• Turn off all heating apparatus, gas valves, and water faucets when not in use.

• Do not remove any equipment or chemicals from the classroom - studio.

• Coats, bags, and other personal items must be stored in designated areas, not on the bench tops or in the aisle ways.

• Keep the floor clear of all objects (e.g., ice, small objects, spilled liquids).

7. Housekeeping - Faculty and Students

• Work areas should be kept neat and free of any unnecessary objects.

• Classrooms - studios workspaces should be thoroughly cleaned at the end of the classroom - studio session.

• Keep all sink drains clear and free of debris.

• Never block access to exits or emergency equipment.

• Inspect all equipment for damage (cracks, defects, etc.) prior to use; do not use damaged equipment.

• Never pour chemical waste into the sink drains or wastebaskets. Chemical waste containers are provided for this purpose.

• Place chemical waste in appropriately labeled waste containers.

• Properly dispose of broken glassware and other sharp objects (e.g., syringe needles), immediately, in designated containers.

• Properly dispose of weigh boats, gloves, filter paper, and paper towels in the appropriate container within the classroom - studio.

8. Apparel in the Classroom – Studio – Faculty and Students

• Always wear appropriate eye protection (i.e., chemical splash goggles) in the studio when hazardous materials are being handled, by anyone.
• Wear disposable gloves, as provided in the classroom - studio, when handling hazardous materials.

• Remove the gloves, and wash your hands, before exiting the classroom - studio.

• Wear a full-length, long-sleeved laboratory coat or chemical-resistant apron, when handling chemicals within the classroom - studio.

• Wear shoes that adequately cover the whole foot; low-heeled shoes with non-slip soles are preferable. Do not wear sandals, open-toed shoes, open-backed shoes, or high-heeled shoes in the classroom - studio.

• Avoid wearing shirts exposing the torso, shorts, or short skirts; long pants that completely cover the legs are preferable.

• Secure long hair and loose clothing (especially loose long sleeves, neck ties, or scarves). Remember that hair and loose clothing can catch on fire or get caught in rotating equipment if not secured.

• Remove jewelry (especially dangling jewelry) to prevent damage and / or becoming entangled in the classroom - studio equipment.

• Synthetic finger nails are not recommended in the studio; they are made of extremely flammable polymers that can burn to completion and are not easily extinguished.

8. Hygiene Practices – Faculty, Staff and Students

• Keep your hands away from your face, eyes, mouth, and body while using chemicals/hazardous materials.

• Food and drink, open or closed, should never be brought into the classroom - studio or chemical storage area.

• Never use laboratory glassware for eating or drinking purposes.

• Do not apply cosmetics while in the classroom - studio or storage area.

• Wash hands after removing gloves, and before leaving the classroom - studio.

• Remove any protective equipment (i.e., gloves, lab coat or apron, chemical splash goggles) before leaving the classroom - studio.
• In case of an emergency or accident, follow the established emergency plan as explained by the teacher and evacuate the building via the nearest exit.

9. Chemical Handling And Labeling – Faculty, Staff and Students

• Check the label to verify it is the correct substance before using it.

• Wear appropriate chemical resistant gloves before handling chemicals-hazardous materials. Gloves are not universally protective against all chemicals.

• If you transfer chemicals-hazardous materials from their original containers, label chemical containers as to the contents, concentration, hazard, date, and your initials. **Appendix D should be consulted for assistance with correct labeling procedures.**

• Always use a spatula or other device to remove, or transfer, a solid chemical-hazardous material from a container.

• Do not directly touch any chemical-hazardous material with your hands.

• Never use a metal spatula when working with peroxides. Metals will decompose explosively with peroxides.

• Hold containers away from the body when transferring a chemical or solution from one container to another.

• Use a hot water bath to heat flammable liquids. Never heat directly with a flame.

• Add concentrated acid to water slowly. Never add water to a concentrated acid.

• Weigh out or remove only the amount of chemical you will need. Do not return the excess to its original container, but properly dispose of it in the appropriate waste container.

• Never touch, taste, or smell any chemicals or hazardous materials.

• Never place the container directly under your nose and inhale the vapors.

• Never mix or use chemicals not called for in the classroom - studio exercise.

• Use the laboratory chemical hood, or slot hood, if available, when there is a possibility of release of toxic chemical vapors, dust, or gases. Chemicals and equipment should be placed at least six inches within the fume hood, or no farther away than 10 inches from a slot hood, to ensure proper air flow and adequate evacuation of chemical-hazardous vapors.
• Clean up all spills properly and promptly as instructed by the instructor.

• Dispose of chemicals as instructed by the instructor.

• When transporting chemicals (especially 250 mL or more), place the immediate container in a secondary container or bucket (rubber, metal or plastic) designed to be carried and large enough to hold the entire contents of the chemical.

• Never handle bottles that are wet or too heavy for you.

• Use equipment (glassware, Bunsen burner, etc.) in the correct way, as indicated by the instructor.

10. **What Is a Material Safety Data Sheet?**

Material Safety Data Sheets (MSDS) are fact sheets and contains information regarding the proper procedures for handling, storing, and disposing of chemical substances.

• An MSDS should accompany all chemicals or kits that contain chemicals. MSDS should be ordered every time a chemical / hazardous material is ordered.

• An MSDS for every hazardous material found within the classroom – studio should be readily available and easily accessible.

• It is suggested that all MSDSs be stored in a designated file or binder using a system that is organized and easy to understand.

• Place the MSDS collection in a central, easily accessible location known to all workers and emergency personnel.

11. **Considerations For Purchasing and Inventorying Chemicals**

First, a chemical procurement plan should be developed that incorporates the CHEMATIX system used at Georgia State University. CHEMATIX is chemical management program used at GSU and has many features built into it so that inventory can be tracked and excess chemicals can be utilized before buying more.

Before ordering chemicals one should consider the following:
• Assess all the hazards and physical properties of the chemical using the MSDS to evaluate both short- and long-term risks.

• Consider the worst case scenario(s) in the event that the substance is mismanaged, spilled, or causes personal injury.

• Make sure the hazardous properties of the chemical do not exceed the educational utility of the project.

• Determine whether a safer, less hazardous chemical can be used.

• Determine whether the appropriate facilities are available for the proper storage of the chemical and the ventilation is sufficient.

• Determine whether the proper personal protective equipment and safety equipment is on hand for using the chemical.

• Establish whether the chemical or its end product will require disposal as a hazardous waste.

• Ensure that the budget will allow for the appropriate and legal disposal of the chemical and/or its end product.

• Have a mechanism in place to dispose of the chemical and its end product legally and safely.

  Georgia State University’s Environmental Programs should be consulted on the correct way to dispose of chemicals and/or hazardous materials.

• Determine whether lesser amounts of a chemical can be used to conduct the experiment – project.

12. Disposal of Chemical Waste

The U.S. Environmental Protection Agency (EPA) has written a comprehensive set of regulations that govern the management of hazardous waste from the point of generation to ultimate disposal. Generators of hazardous waste are responsible for ensuring proper disposal of their hazardous waste and can incur liability for improper disposal of their hazardous waste.

Georgia State University has protocols and procedures for management of any unwanted chemicals and the disposal of chemicals that comply with the EPA regulations.
Procedures for disposal of waste, or unwanted, materials can be found at:
http://spidey1dev.gsu.edu/images/vp_research/Hazardous_Chemical_Waste_Procedures.pdf

Hazardous Waste Labels may be obtained at:
http://spidey1dev.gsu.edu/images/vp_research/Hazwaste_labels.pdf

13. General Information and Guidelines – For Safe Chemical Handling

How Does a Chemical Enter the Body?

A chemical can enter the body through different routes. These different routes of exposure and the types of exposure (acute or chronic) can affect the toxicity of the chemical.

The most probable (primary) route(s) of exposure to a chemical will be identified in the MSDS.

Four principal routes of exposure include: dermal exposure (skin), inhalation, ingestion (oral) and injection.

Dermal Exposure

Although the skin is an effective barrier for many chemicals, it is a common route of exposure. The toxicity of a chemical depends on the degree of absorption that occurs once it penetrates the skin. Once the skin is penetrated, the chemical can enter the blood stream and be carried to all parts of the body. Chemicals are absorbed much more readily through injured, chapped, or cracked skin, or needle sticks than through intact skin. Generally, organic chemicals are much more likely to penetrate the skin than inorganic chemicals.

Dermal exposure to various substances can also cause irritation and damage to the skin and/or eyes. Depending on the substance and length of exposure, effects of dermal exposures can range from mild temporary discomfort to permanent damage.

Inhalation

Inhalation is another route of chemical exposure. Chemicals in the form of gases, vapors, mists, fumes, and dusts entering through the nose or mouth can be absorbed through the mucous membranes of the nose, trachea, bronchi, and lungs. Unlike the skin, lung tissue is not a very protective barrier against the access of chemicals into the body. Chemicals, especially organic chemicals, enter into the blood stream quickly. Chemicals can also damage the lung surface.
Ingestion

Ingestion involves chemicals entering the body through the mouth. Chemical dusts, particles and mists may be inhaled through the mouth and swallowed.

Injection

Injection involves transferring chemicals through the skin via a sharp object, either directly or indirectly. Chemical can be indirectly injected into the skin when a person is cut with a chemically contaminated sharp object.

14. General Guidelines to Follow in the Event of a Chemical Accident or Spill

- Assess the overall situation.
- Determine the appropriate action to resolve the situation.
- Follow the pre-existing, approved site specific emergency plan for your classroom - studio.
- Act swiftly and decisively.
- All laboratories which handle hazardous materials shall have an appropriate supply of spill cleanup kits. The supply must be capable of containing or cleaning up small known chemical releases.
- Laboratory/studio personnel should not attempt to clean up a spill of certain hazardous materials:
  i. Having a health or hazard rating of 3 or 4 (Appendix E) ; or
  ii. If appropriate spill clean-up supplies and protective equipment are not available;
  iii. or If the material or level of exposure hazard is unknown.

Recommended Actions For Specific Emergencies

Chemical in the Eye

- Flush the eye immediately with water while holding the eye open with fingers.
- If wearing contact lens, remove and continue to rinse the eye with water.
- Continue to flush the eye and seek immediate medical attention.
- Take a MSDS for the material with you so the medical personnel can determine appropriate treatment quickly.

**Chemicals on the Skin**

For spills directly on human skin, do the following:

- Flush area with copious amounts of cold water from the faucet or drench shower for at least 5 minutes.
- If spill is on clothing, first remove clothing from the skin and soak the area with water as soon as possible. A Fire Blanket can be utilized as a modesty covering.
- Arrange treatment by medical personnel, if person is experiencing any difficulty after soaking/washing of the skin.

For a spill not directly on human skin, do the following:

- Use an appropriate spill kit, contained within the classroom – studio. Note: all spill kits will not usually work with all chemicals.
- Cover the spill with the absorbent material.
- Avoid inhaling vapors.
- Sweep up and dispose of as hazardous waste, according to the instructions on the spill kit.

**Flammable Liquids**

Flammable and combustible liquids are present in nearly every workplace. Turpentine, mineral spirits, many common products like solvents, thinners, cleaners, adhesives, paints, waxes, and polishes may be flammable or combustible.

These products are ubiquitous in an art classroom – studio setting. However, if used or stored improperly, serious fires and death may occur. If spilled, they may require special handling.

Control all ignition sources in areas where flammable liquids are used. Smoking, open flames and spark producing equipment should not be used. If spilled, clean up should be conducted immediately and all clean up materials be stored appropriately until Office of Research Integrity can be notified.
VI PUBLIC EMPLOYEE HAZARDOUS CHEMICAL PROTECTION & RIGHT TO KNOW RULES – (Right To Know)

Introduction

The Georgia Law was designed to alert public employees about hazardous chemicals, safe handling precautions, and emergency and first aid procedures and to comply with the State of Georgia Public Employee Hazardous Chemical Protection & Right to Know Rules.

Under the Right to Know Program, individuals who work with hazardous chemicals, or who may be exposed to hazardous chemicals have the right to know:

- What chemical substances are present in the products they handle;
- What health effects these chemicals are capable of causing in the event of overexposure;
- What precautions are necessary to protect from exposure
- What physical hazards (e.g., fire, explosion) are possible if the product is not handled properly
- How to properly handle the product in order to avoid hazards

The Right To Know Program consists of six major elements: hazard evaluation, labeling, material safety data sheets, a written program, contractor requirements and training.

Hazard Evaluation

Manufacturers, importers, or distributors of chemicals are required to assess the physical and health hazards of their products. This information must be recorded on the product label and included in a material safety data sheet (MSDS).

Labeling

The manufacturer must label containers with the chemical name(s), hazard warnings, and the manufacturer’s name and address. The manufacturer’s label must not be removed or defaced. If the product is transferred from one container to another, the new container must be labeled with the product name and appropriate hazard warnings.
Material Safety Data Sheets (MSDS)

MSDS’ must be obtained for each hazardous material in the workplace. These MSDSs must be accessible to individuals working with the products during all work hours. If an MSDS is not received with a chemical shipment, the department must obtain the MSDS within a reasonable amount of time.

Written Hazard Communication Program

Georgia State University has developed a written Right To Know Program detailing how to comply with the provisions of the Georgia Law. The program includes an inventory of hazardous materials used or stored by the department; handling of MSDSs, including where they will be maintained, how they will be obtained, and how to access them; labeling requirements; training requirements; contractor requirements; and provisions for non-routine tasks.

The program may be accessed at: http://www.gsu.edu/images/AuxiliaryImages/Right_To_Know_Basic_Functions_and_Responsibilities_at_Georgia_State_University.pdf

Contractors

Contractors must be informed of the potential hazards which may be encountered during their work at the University. This includes giving contractors access to the hazardous chemical inventories and the MSDSs for these chemicals. Similarly, the contractor is expected to inform and provide departments with a chemical inventory and MSDSs for the materials that will be introduced into the work area in the course of their work at Georgia State University. The contractor must also provide information regarding the location of chemical use and storage.

Training Requirements

All individuals who work for Georgia State University are required to have documented, basic Right To Know Training. This training may be taken online, and a certificated may be printed that can be put in their departmental employment file. The site access for this training is: http://www.usg.edu/ehs/training/rtkbasic/ This basic training is only required once or as long as the training completion can documented.

All individuals who handle hazardous materials are required to receive additional documented training, at least yearly, that includes specific information about hazardous materials being used within the classroom –studio workspace.

Each faculty member is responsible for informing employees and students of:

- The location and availability of the written Right To Know Program, the chemical

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inventory, and MSDSs

- The nature and potential health and safety risk of specific hazardous substances to which individuals may be exposed in the course of their work
- The proper handling, under all circumstances, of hazardous materials in the workplace
- The appropriate emergency treatment for exposures
- Procedures for clean-up of leaks and spills
- The location of hazardous materials in the workplace

The School of Art and Design is responsible for assuring that employees receive the appropriate training and for keeping records of this training.

Special hazards which workers may encounter when performing non-routine duties in the course of their work must be discussed with the worker before the job begins. It is the responsibility of the supervisor to ensure that workers receive specialized training, as needed.

**Summary**

Individuals who work with chemicals have the right and responsibility to know about the hazards of the chemicals they use and how to work with them in a safe manner which minimizes exposure to chemicals.

In order to accomplish this, each person must:

- Attend training.
- Maintain proper labeling of chemical containers.
- Review MSDSs for hazardous chemicals before working with them.
- Follow instructions and recommendations when using chemicals.
- Use appropriate personal protective equipment, as necessary.
- Report potentially hazardous conditions to supervisors.

**VII Personal Protective Equipment (PPE)**

Personal protective equipment (PPE) is special gear used to protect the wearer from specific hazards of a hazardous substance. It is a last resort protection system, to be
used when substitution or engineering controls are not feasible.

It should be understood that PPE does not reduce or eliminate the hazard. It only protects the wearer and does nothing for anybody else in the area or for any equipment exposed to the chemical.

PPE includes gloves, respiratory protection, eye protection, and protective clothing. The need for PPE is dependent upon the type of operations and the nature and quantity of the materials in use, and must be assessed on a case by case basis. Workers who rely on PPE must understand the function, proper use, and limitations of the PPE used.

1. **Glove Selection And Use**

Gloves should be worn whenever the possibility of skin contact with hazardous chemicals exists. Every glove is permeable to a chemical. The permeability varies with the chemical being used, the length of time of the exposure and the thickness of the glove.

General use gloves, such as the latex surgical gloves, may be appropriate when using small amounts of most chemicals for short periods of time. These gloves should be changed whenever they become contaminated with the chemical.

Otherwise, the glove that offers the best resistance to the chemical should be used.

The following guidelines should be used to determine the appropriate glove.

- Review the Material Safety Data Sheet (MSDS) for the chemical of interest.
- Determine the potential consequences of skin contact by the chemical.
- Determine the exposure period and characteristic of the potential contact. That is, are you choosing gloves to protect you from an occasional splash or spill or are you planning to wear the gloves while you immerse your entire hand and arm in a container of material.
- Determine which gloves or glove materials offer the best resistance to the chemical. This information may be found in the Personal Protective Equipment section of the MSDS or glove vendor information. Establish the dexterity and sizing requirements.
- Determine physical resistance properties required of the glove. That is, resistance to heat, cutting, punctures, etc.
- Other considerations - color, cuffs, length of glove, use of liners.
• Establish a decontamination procedure. Be sure to check for pinholes before use, wash or decontaminate gloves before removing, and wash hands after removing.

In addition to protecting hands and skin from chemical exposures, there are many gloves which offer protection from physical hazards, such as high or low temperatures, electrical shock, skin abrasions, vibration or sharp objects. Always match the glove to the hazard.

2. Respiratory Protection

A respirator may only be used when engineering controls, such as general ventilation, slot hoods or fume hoods, are not feasible or do not reduce the exposure of a chemical to acceptable levels.

The use of a respirator is subject to prior review by both the Environmental Programs Manager and the Occupational Health and Safety Officer. Respirator use is regulated by the United States Department of Labor and specific criteria are required before respirators can be issued.

Any person who believes that respiratory protection is needed must notify the Occupational Health and Safety Officer, or Environmental Programs Manager, for evaluation of the hazard and enrollment in the Respiratory Protection Program.

This program involves procedures for respirator selection, medical assessment of employee health, employee training, proper fitting, respirator inspection, maintenance, and record keeping.

3. Eye Protection

Safety glasses should be worn for protection from impact of particles. Standard eyeglasses fitted with side shields are generally not sufficient.

Goggles should be worn when a potential splash from a hazardous material exists. They may be worn over prescription glasses.

Face shields are in order when working with large volumes of hazardous materials, either for protection from splash to the eye or flying particles. Face shields may be used in conjunction with goggles for maximum protection from corrosives and hot chemicals.

Contact lenses do not offer any protection from chemical contact.

4. Other Protective Clothing

When the possibility of chemical contamination exists, protective clothing, which resists physical and chemical hazards, should be worn over street clothes.
Smocks are appropriate for minor chemical splashes and spills, while plastic or rubber aprons are best for protection from corrosive or irritating liquids.

Loose clothing (such as overlarge smocks or ties), skimpy clothing (such as shorts), torn clothing and unrestrained hair may pose a hazard. Perforated shoes, sandals, or cloth sneakers should not be worn in chemical use areas or where mechanical work is being performed.

VIII Hazardous Wastes

1. Types of Wastes

There are several types of wastes that can be generated in the School of Art and Design. Some examples include:

- Oily rags
- Solvent wastes (turpentine, paint thinner, etc.)
- Paints
- Baby oil
- Linseed oil
- Ceramic glaze
- Ceramic clay
- Photographic chemicals
- Acids and bases
- Sharp implements
- Lubricating oils
- Empty chemical containers

Many of these wastes are considered hazardous waste by the US Environmental Protection Agency and require special handling. These materials may not be poured down the drain.

2. Oil Soaked Rags

Oily rags must be placed in an oily rag can, provided within the classroom-studio. Do not leave oily rags lying around the floor. Linseed oil, in particular, can ignite on its own if left out, causing fire that may spread to other areas. The oily rag can is self-closing to prevent such an occurrence.

Oily rag cans should be located in each classroom – studio generating such materials.

Contact the University Environmental Programs for instructions on having these containers emptied when they are full.

3. Solvents

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Solvents, such as paint thinner, turpentine, toluene, xylene, and alcohols are considered hazardous waste.

**DO NOT DUMP** them down the drain. Follow the University instructions for handling hazardous waste.

4. **Paints**

Oil-based paints are considered hazardous waste.

**DO NOT DUMP** oil-based paint down the drain or place in regular trash.

Oil-based paints may be combined with solvents and linseed oil for disposal, if prior approval is received from the University’s Environmental Program Manager.

Follow the instructions for handling hazardous wastes. Latex paints should be dried out and placed in regular trash. Water-based paints may possibly be disposed via the regular trash, but must be approved by Environmental Programs before disposal.

5. **Linseed Oil**

Because of its potential for fire, linseed oil should be handled as a hazardous waste, in a similar manner as solvents.

Linseed oil can be combined with oil-based paints and solvents for disposal, if prior approval is received from the University’s Environmental Programs Manger.

Follow the instructions for handling hazardous waste.

6. **Acids and Bases**

Materials with a pH of less than 2 or more than 12.5 are considered hazardous waste. Do not mix these wastes with the solvent or oil wastes. Use care when handling acids and bases and follow the instructions for handling hazardous waste.

7. **Lubricating Oils**

Oils such as pump oil, motor oil and other machine oils are recyclable. These materials should be placed in a plastic container, sealed and labeled as *Used Oil*. Do not label them as hazardous waste or as waste oil. The used oil should be disposed of via the waste pickup.

8. **Broken Glass Sharp Implements**

Sharp objects, such as razor blades, knives, and broken glass should be packaged in a
puncture-proof jar or box and placed in the regular trash. Pre-packaging helps to avoid injury to janitors or others handling the trash. Contact the University Environmental Programs for information on how to obtain specially designated sharps containers.

9. **Empty Chemical Containers**

Empty chemical containers should be triple-rinsed and recycled or placed in regular trash. Contact the University Environmental Programs for information on how to obtain specially designated sharps containers.

10. **Handling Hazardous Waste**

Materials that are to be disposed of as hazardous waste must be placed in sealable containers. Containers should be filled, leaving a headspace for expansion of the contents. Often the original container is perfectly acceptable.

If you routinely generate significant quantities of compatible solvents, bulking of waste in five-gallon carboys provided by University Environmental Programs may be practical. Containers must be kept closed except during actual transfers. **Do not leave a hazardous waste container with a funnel in it.**

Waste containers must be **labeled as hazardous waste as soon as the material is first put into the container.** Waste container labels are available on each flammable liquid storage cabinet and through the sculpture shop.

Be sure to include the name and phone number of a person that can be reached on the day of the waste pickup.

11. **Recommended Procedures – Obtaining Supplies and Assistance**

The following procedure refers to hazardous chemical waste only (not biological/medical waste).

1. Keep your hazardous waste containers clean, in good condition, and make sure they are securely closed at all times.

2. Store your hazardous waste containers in secondary containment such as trays to minimize opportunities for a spill.

3. Make sure your hazardous waste containers are labeled with a yellow hazardous waste sticker that details the contents using full chemical names (no abbreviations) and percentages, or using a GSU waste stream name.

4. When your hazardous waste containers are full, create a Pickup Worksheet at [https://chematix.gsu.edu/Chematix/](https://chematix.gsu.edu/Chematix/) and submit your request through Chematix. You may also e-mail eprograms@gsu.edu.
5. If you require replacement supplies indicate this on your online Environmental Work Request.

6. If you require supplies at any time, without a waste pick-up e-mail eprograms@gsu.edu A list of supplies is available for review online at http://www.gsu.edu/research/lab_safety_supplies.html

7. Allow 72 hours for the waste pick-up or supply delivery.

For questions or concerns contact the Environmental Program Manager: 404-413-3551, or a Chemical Safety Specialist: 404-413-3535 or 404-413-3568


   - Don’t purchase more of a material than you expect to use in the foreseeable future. The costs of disposal often exceed the purchase cost by a considerable margin.

   - Substitute with a less hazardous material whenever possible.

   - Consistent with safe practice, bulk compatible waste in containers up to five gallons in capacity to reduce disposal costs (consult with Environmental Programs first).

   - Keep all chemical containers clearly and unambiguously labeled.

   - Dispose of your wastes at the completion of a project - don’t abandon them for someone else to deal with later.

13. **Responsibilities for Hazardous Waste**

    a. **Individuals Generating Waste**

        - **Minimize hazardous waste generation** by reducing scale, substituting with less hazardous substances, reusing materials, recycling chemicals, etc.

        - **Identify** which wastes are hazardous wastes and follow established protocols.

        - **Label** all wastes appropriately.

        - Keep waste containers sealed at all time. Do not leave funnels in containers.

        - Properly dispose of all wastes at the conclusion of a project and before leaving the University.

        - Notify Environmental Programs of any problems involving chemical wastes.
b. **Department**

- Ensure that all individual generators of hazardous waste within the department are aware of University policies and procedures for proper disposal of hazardous wastes
- Distribute information on hazardous waste disposal (including pickup schedules) to all applicable parties

c. **Faculty and Staff**

- Ensure that all individuals involved in activities that generate waste are aware of and follow the waste disposal policies and procedures.
- Periodically review current practices to minimize the quantities of hazardous waste generated
- Ensure that all chemical wastes are disposed of properly at the conclusion of a project and that wastes are properly identified for disposal before the responsible individual leaves the University

d. **Environmental Programs**

- Administer hazardous waste disposal services contracts
- Provide technical advice on proper waste classification, storage and disposal practices
- Maintain disposal records and generate state-required reports of hazardous waste activity

e. **Hazardous Waste Summary Information**

All hazardous wastes shall be disposed of in accordance with the most current revision of Georgia State University’s Hazardous Materials Program Manual, Radiation Safety & Regulatory Compliance Manual, Biological Safety Manual, Select Agents Policies and Controlled Substance Policies.
IX. Laboratory - Studio Decommissioning

The following procedures shall be carried out and completed when the responsible individual leaves the University or transfers to a different laboratory/studio.

Upon completion, the Principal Investigator – Faculty member will contact the responsible Departmental Chair and the Associate Vice President for Research Integrity for final checkout.

1. Chemicals

The faculty member shall assure that all containers of chemicals are labeled with the name of the contents. All containers are to be securely closed. Beakers, flasks, dishes, etc., shall be emptied. (Check all refrigerators, freezers, fume hoods, and cabinets.)

Determine which materials are usable and transfer the surplus to another user who is willing to take charge of them. If a user cannot be found, it shall be disposed of through the Georgia State University waste disposal program.

All fume hood surfaces and counter tops shall be washed off and cleaned.

The respective Departmental Chair is to be notified when the laboratory has been cleared and cleaned.

2. Gas Cylinders

If cylinders are not returnable, contact Office of Research Integrity for advice.

3. Equipment

If laboratory equipment is to be left for the next occupant, clean or decontaminate before departing the laboratory. Equipment with chemical residue or hazardous material constituents such as mercury or waste oil or hazardous materials must not be taken to surplus property.
APPENDIX A

FIRST AID KIT REQUIREMENTS

The US Department of Labor, Occupational Health and Safety Administration (OSHA) states in the Code of Federal Regulations (29 CFR 1910.151): "Adequate first aid supplies shall be readily available." The regulation is silent, however, as to what constitutes "adequate" supplies.

For guidance on what first aid supplies are needed, the OSHA regulation includes Appendix A, which calls upon an American National Standards Institute standard (ANSI Z308.1-1998) that more precisely outlines the supplies generally needed in a basic first aid kit. This ANSI standard is currently not a national mandatory regulation (although the ANSI standards have been adopted as requirements by more than 20 states), but it does provide a useful guideline to follow when determining what to include in your workplace first aid kit.

ANSI Z308.1-1998 lists the following minimum workplace first aid kit requirements:

- 1 absorbent compress, 32 sq. in. with no side smaller than 4 in.
- 16 adhesive bandages, 1 x 3 in.
- 1 adhesive tape, 3/8 in. x 5 yd.
- 10 antiseptic applications, .5 fl. oz.
- 6 burn treatment applications, .5 oz.
- 2 pairs of medical exam gloves
- 4 sterile pads, 3 x 3 in.
- 1 triangular bandage, 40 x 40 x 56 in.

In addition to the kit's contents, ANSI Z308.1-1998 defines three types of first aid kits:

- Type I kits are intended for use in a stationary, indoor setting and should have a means by which to be mounted.
- Type II kits are intended for use in a portable, indoor setting and should have a carrying handle.
- Type III kits are intended for use in portable, indoor or outdoor applications and should have a carrying handle and a means by which to be mounted.

In 2009, ANSI Z308.1 was updated to include a few changes to the minimum fill requirements. The standard now calls for the inclusion of six antibiotic treatment applications (14 fl. oz. each) and a first aid guide.

The amount of adhesive tape required is now listed as 2.5 yd.

In ANSI Z308.1-2009; Type III kits are broken down into two distinct categories:

- Type III kits are intended for use in portable indoor or outdoor settings where the potential for damage to the kit is minimal
- Type IV kits are intended for use in portable indoor or outdoor settings where the potential for damage to the kit is significant. These kits should be made of metal.
Addressing unique hazards it is of the utmost importance to analyze any hazards specific to your workplace and to include supplies and additional personnel training in your first aid program to accommodate these hazards.

APPENDIX B

BASIC SAFETY AND EMERGENCY EQUIPMENT A CLASSROOM – STUDIO SHOULD CONTAIN

The following are the basics needed for safety and for potential emergencies within a laboratory and / or classroom - studio:

Personal Protective Equipment

- Chemical splash safety glasses and/or goggles
- Face shields
- Lab coat
- Lab apron
- Gloves (selected based on the material being handled and the particular hazard involved)

Safety and Emergency Equipment

- Hand-free eye-wash stations (not eye-wash bottles) that conform to ANSI Z358.1–2004
- Deluge safety showers that conform to ANSI Z358.1–2004
- Safety shields with heavy base
- Fire extinguishers (dry chemical and carbon dioxide extinguishers)
- Sand bucket
- Fire blankets
- Emergency lights
- Emergency signs and placards
- Fire detection or alarm system with pull stations
- First-aid kits – Refer to Appendix A for items to include
- Spill control kit (absorbent and neutralizing agents)
- Chemical storage cabinets (preferably with an explosion proof ventilation system)
- Gallon-size carrying buckets for chemical bottles
- Laboratory chemical hood (60–100 ft/minute capture velocity, vented outside), or slot hoods
- Ground-fault interrupter electrical outlets
- Container for broken glass and sharps
- Material Safety Data Sheets (MSDSs) for all hazardous materials used or stored within the classroom – studio.
- Emergency Action Plan for the Department
APPENDIX C – GLOSSARY OF TERMS

Acid
A substance that dissolves in water and releases hydrogen ions (H⁺); acids cause irritation, burns, or more serious damage to tissue, depending on the strength of the acid, which is measured by pH.

Acute toxicity
Adverse effects resulting from a single dose, or exposure to a substance for less than 24 hours.

Allergy
An exaggerated immune response to a foreign substance causing tissue inflammation and organ dysfunction.

Asphyxiant
A substance that interferes with the transport of an adequate supply of oxygen to the body by either displacing oxygen from the air or combining with hemoglobin, thereby reducing the blood’s ability to transport oxygen.

Base
A substance that dissolves in water and releases hydroxide ions (OH⁻); bases cause irritation, burns, or more serious damage to tissue, depending on the strength of the base, which is measured by pH.

Carcinogen
A substance that causes cancer.

CAS Registry number
An internationally recognized unique registration number assigned by the Chemical Abstracts Service to a chemical, a group of similar chemicals, or a mixture.

Ceiling limit
The maximum permissible concentration of a material in the working environment that should never be exceeded for any duration.

Chemical hygiene plan
A written program that outlines procedures, equipment, and work practices that protect employees from the health hazards present in the workplace.

Chemical hygiene officer
A designated person who provides technical guidance in the development and implementation of the Chemical Hygiene Plan.

Chronic toxicity
Adverse effects resulting from repeated doses of, or exposures to, a substance by any route for more than three months.

Central Nervous System (CNS)
The central nervous system is the part of the nervous system that consists of the brain and spinal cord.
**Combustible liquid**
A liquid with a flashpoint at a temperature lower than the boiling point; according to the National Fire Protection Association and the U.S. Department of Transportation, it is a liquid with a flash point of 100 °F (37.8 °C) or higher.

**Compatible materials**
Substances that do not react together to cause a fire, explosion, violent reaction or lead to the evolution of flammable gases or otherwise lead to injury to people or danger to property.

**Compressed gas**
A substance in a container with an absolute pressure greater than 276 kilopascals (kPa) or 40 pounds per square inch (psi) at 21 oC, or an absolute pressure greater than 717 kPa (40 psi) at 54 oC.

**Consumer Product Safety Commission (CPSC)**
An independent U.S. Federal regulatory agency that protects the public against unreasonable risk of injury and death associated with consumer products.

**Corrosive**
A substance capable of causing visible destruction of, and/or irreversible changes to living tissue by chemical action at the site of contact (i.e., strong acids, strong bases, dehydrating agents, and oxidizing agents).

**Explosive**
A substance that causes a sudden, almost instantaneous release of pressure, gas, and heat when subjected to sudden shock, pressure, or high temperature.

**Exposure limits**
The concentration of a substance in the workplace to which most workers can be exposed during a normal daily and weekly work schedule without adverse effects.

Appendix M. Glossary

**Federal Hazardous Substances Act (FHSA)**
The Federal Hazardous Substances Act (15 U.S.C 1261–1278), administered by the Consumer Product Safety Commission, requires that certain household products that are “hazardous substances” bear cautionary labeling to alert consumers to potential hazards that those products present and inform them of the measures they need to protect themselves from those hazards. Any product that is toxic, corrosive, flammable or combustible, an irritant, a strong sensitizer, or that generates pressure through decomposition, heat, or other means requires labeling, if the product may cause substantial personal injury or substantial illness during or as a proximate result of any customary or reasonable foreseeable handling or use, including reasonable foreseeable ingestion by children.

**Federal Labeling of Hazardous Art Materials Act (LHAMA)**

Under LHAMA, all art material labels must include:

1. A statement that the product and its labeling conform to ASTM D-4236. This does not mean that the product is safe, only that following the label’s advice should enable the consumer to use the product safely;

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3. a list of all potentially hazardous ingredients and signal words such as Caution or Danger (Note: manufacturers may consider some ingredients to be proprietary and therefore are not required to list those specific ingredients even if they are hazardous);

4. chronic hazard statements which inform the user of the kind of harm the product might cause such as, “Cancer Agent,” or “Exposure may cause allergic reaction”;

5. precautionary statements which tell the user what actions they must take in order to use the product safely;

6. a manufacturer’s telephone number; and

7. A statement that the product is not appropriate for use by children.

Note that materials deemed to be “non-toxic” by the certifying toxicologist only need to have the manufacturer’s name and address and an ASTM D4236 conformance statement. Products labeled “nontoxic” may also contain chemicals for which there are no chronic toxicity data. Use all art products with care.

**Flammable**
As defined in the Federal Hazardous Substances Act (FHSA) regulations at 16 CFR § 1500.3(c)(6)(ii), a substance having a flashpoint above 20 °F (−6.7 °C) and below 100 °F (37.8 °C). An extremely flammable substance, as defined in the FHSA regulations at 16 CFR § 1500.3(c)(6)(i), is any substance with a flashpoint at or below 20 °F (−6.7 °C).

**Flashpoint**
The minimum temperature at which a liquid or a solid produces a vapor near its surface sufficient to form an ignitable mixture with the air; the lower the flash point, the easier it is to ignite the material.

**Hazardous substance**
As defined in the Federal Hazardous Substances Act (FHSA) at 16 CFR § 1500.3(b)(4)(i)(A), any substance or mixture of substances that is toxic, corrosive, an irritant, a strong sensitizer, flammable or combustible, or generates pressure through decomposition, heat, or other means, if it may cause substantial personal injury or illness during or as a proximate result of any customary or reasonably foreseeable handling or use, including reasonably foreseeable ingestion by children.

**Hepatotoxin**
A chemical that can cause liver damage.

**Highly toxic substance**
As defined by OSHA (Appendix A of 29 CFR 1910.1200) and in the FHSA regulations at 16 CFR § 1500.3(b)(6)(i), a substance with either (a) a median lethal dose (LD50) of 50 mg/kg or less of body weight administered orally to rats, (b) a median lethal dose (LD50) of 200 mg/kg or less of body weight when administered continuously on the bare skin of rabbits for 24 hours or less, or (c) a median lethal concentration (LC50) in air of 200 parts per million by volume or less of gas or vapor, or 2 mg/L by volume or less of mist or dust, when administered by continuous inhalation for 1 hour or less to rats.

**Ignitable**
A substance capable of bursting into flames; an ignitable substance poses a fire hazard.

A substance capable of bursting into flames; an ignitable substance poses a fire hazard.
International Agency for Research on Cancer (IARC)
An agency of the World Health Organization that publishes IARC Monographs on the Evaluation of the Carcinogenic Risk of Chemicals to Humans. This publication documents reviews of information on chemicals and determinations of the cancer risk of chemicals.

Incompatible materials
Substances that can react to cause a fire, explosion, violent reaction or lead to the evolution of flammable gases or otherwise lead to injury to people or danger to property.

Ingestion
Taking a substance into the body by mouth and swallowing it.

Inhalation
Breathing a substance into the lungs; substance may be in the form of a gas, fume, mist, vapor, dust, or aerosol.

Irritant
A substance that causes a reversible inflammatory effect on living tissue by chemical action at the site of contact.

Known human carcinogen
A substance for which there is sufficient evidence of a cause and effect relationship between exposure to the material and cancer in humans.

Lacrimation
Excessive production of tears when the eye is exposed to an irritant.

LC50 (Median Lethal Concentration 50)
The concentration of a chemical that kills 50% of a sample population; typically expressed in mass per unit volume of air.

LD50 (Median Lethal Dose 50)
The amount of a chemical that kills 50% of a sample population; typically expressed as milligrams per kilogram of body weight.

Mutagen
A substance capable of changing genetic material in a cell.

National Fire Protection Association
An organization that provides information about fire protection and prevention and developed a standard outlining a hazard-warning labeling system that rates the hazard(s) of a material during a fire (health, flammability, and reactivity hazards).

National Institute for Occupational Safety and Health (NIOSH)
U.S. Federal agency of the Centers for Disease Control and Prevention (CDC) that investigates and evaluates potential hazards in the workplace. NIOSH is also responsible for conducting research and providing recommendations for the prevention of work-related illness and injuries.
National Toxicology Program (NTP)
U.S. Federal interagency program that coordinates toxicological testing programs, develops and validates improved testing methods, and provides toxicological evaluations on substances of public health concern.

Neurotoxin
A substance that induces an adverse effect on the structure and/or function of the central and/or peripheral nervous system.

Occupational Safety and Health Administration (OSHA)
U.S. Federal agency that develops and enforces occupational safety and health standards for all general, as well as, construction and maritime industries and businesses in the United States.

Oxidizer
A substance that causes the ignition of combustible materials without an external source of ignition; oxidizers can produce oxygen, and therefore support combustion in an oxygen free atmosphere.

Peroxide former
A substance that reacts with air or oxygen to form explosive peroxy compounds that are shock, pressure, or heat sensitive.

Permissible Exposure Limit (PELs)
The legally enforceable maximum amount or concentration of a chemical that a worker may be exposed to under OSHA regulations.

Personal Protective Equipment (PPE)
Any clothing and/or equipment used to protect the head, torso, arms, hands, and feet from exposure to chemical, physical, or thermal hazards.

pH
A measure of the acidity or basicity (alkalinity) of a material when dissolved in water; expressed on a scale from 0 to 14.

Radioactive Material
A material whose nuclei spontaneously give off nuclear radiation.

The Resource Conservation and Recovery Act (RCRA)
The Resource Conservation and Recovery Act, enacted in 1976, is a Federal law of the United States. The Act gave the U.S. Environmental Protection Agency (EPA) authority to protect the public from harm caused by waste disposal, to encourage reuse, reduction, and recycling, and to clean up spilled or improperly stored wastes. Under RCRA, the U.S. EPA controls hazardous waste from “cradle-to-grave.” This includes the generation, transportation, treatment, storage, and disposal of hazardous waste. RCRA also set forth a framework for the management of non-hazardous wastes.

Reactivity
The capacity of a substance to combine chemically with other substances.

Reproductive toxicity
Adverse effects on sexual function and fertility in adult males and females, as well as developmental toxicity in the offspring (International Programme on Chemical Safety [IPCS] Environmental Health Criteria 225, Principles for Evaluating Health Risks to Reproduction Associated with Exposure to Chemicals).
Right To Know - is a State of Georgia Law that defines how we warn people of the hazards associated with the chemicals they use and the training they need. All chemicals must be in containers bearing information about the identity of the material and its hazards. Original manufacturer containers carry this information. But if you dispense material into a secondary container you must transfer the identity and hazards of the material to the new container. In addition to the labeling requirement, manufacturers are required to prepare material safety data sheets (MSDS) to detail physical and chemical properties and health effects of their products. [http://www.gsu.edu/auxiliary/38489.html](http://www.gsu.edu/auxiliary/38489.html)

Secondary containment
An empty chemical-resistant container/dike placed under or around chemical storage containers for the purpose of containing a spill should the chemical container leak.

Short-Term Exposure Limit (STEL)
The maximum concentration to which workers can be exposed for a short period of time (15 minutes).

Systemic
Affecting many or all body systems or organs; not localized in one spot or area.

Teratogen
A substance which may cause non-heritable genetic mutations or malformations in the developing embryo or fetus when a pregnant female is exposed to the substance.

Threshold Limit Value (TLV)
Term used by the American Conference of Governmental Industrial Hygienists (ACGIH) to express the recommended exposure limits of a chemical to which nearly all workers may be repeatedly exposed, day after day, without adverse effect.

Time Weighted Average (TWA)
The average concentration to which an average worker can be exposed for a normal, 8-hour workday.

Toxic substance
In general, as defined in the FHSA regulations at 16 CFR § 1500.3(b)(5), any substance (other than a radioactive substance) that has the capacity to produce personal injury or illness to man through ingestion, inhalation, or absorption through any surface of the body.

This term is further defined by OSHA and in the FHSA regulations: As defined by OSHA (Appendix A of 29 CFR 1910.1200), a substance with either, a median lethal dose (LD50) of more than 50 mg/kg but not more than 500 mg/kg of body weight administered orally, a median lethal dose (LD50) of more than 200 mg/kg but not more than 1,000 mg/kg of body weight when administered by continuous contact with the bare skin of rabbits, or a median lethal concentration (LC50) in air of more than 200 parts per million but not more than 2,000 parts per million by volume of gas or vapor, or more than 2 mg/L but not more than 20 mg/L of mist, fume, or dust, when administered by continuous inhalation for one hour.
As defined in the FHSA regulations at 16 CFR § 1500.3(c)(2)(i), a substance with either, a median lethal dose (LD50) of 50 mg/kg to 5,000 mg/kg of body weight administered orally in rats, a median lethal dose (LD50) of more than 200 mg/kg but not more than 2,000 mg/kg of body weight when administered by continuous contact with the bare skin of rabbits for 24 hours, or a median lethal concentration (LC50) in air of more than 200 parts per million but not more than 20,000 parts per million by volume of gas or vapor, or more than 2 mg/L but not more than 200 mg/L by volume of mist or dust, when administered by continuous inhalation for 1 hour or less.

**U.S. Department of Transportation (DOT)**
U.S. Federal agency that regulates the labeling and transportation of hazardous materials.

**U.S. Environmental Protection Agency (EPA)**
U.S. Federal agency that develops and enforces regulations to protect human health and the natural environment.

**Water reactive material**
A substance that reacts with water that could generate enough heat for the item to spontaneously combust or explode. The reaction may also release a gas that is either flammable or presents a health hazard.
APPENDIX D

CHEMICAL – HAZARDOUS MATERIAL STORAGE

How Should Chemicals Be Stored?
First, identify any specific requirements regarding the storage of chemicals from (1) local, State, and Federal regulations and (2) insurance carriers.

General Rules for Chemical Storage

Criteria for Storage Area

- Store chemicals inside a closeable cabinet or on a sturdy shelf with a front-edge lip to prevent accidents and chemical spills; a ¾-inch front edge lip is recommended.
- Secure shelving to the wall or floor.
- Ensure that all storage areas have doors with locks.
- Keep chemical storage areas off limits to all students.
- Ventilate storage areas adequately.

Organization

- Organize chemicals first by COMPATIBILITY—not alphabetic succession.
- Store alphabetically within compatible groups.

Chemical Segregation

- Store acids in a dedicated acid cabinet. Nitric acid should be stored alone unless the cabinet provides a separate compartment for nitric acid storage.
- Store highly toxic chemicals in a dedicated, lockable poison cabinet that has been labeled with a highly visible sign.
- Store volatile and odoriferous chemicals in a ventilated cabinet.
- Store flammables in an approved flammable liquid storage cabinet (refer to section entitled Suggested Shelf Storage Pattern).
- Store water sensitive chemicals in a water-tight cabinet in a cool and dry location segregated from all other chemicals in the laboratory.
Storage Don’ts

- Do not place heavy materials, liquid chemicals, and large containers on high shelves.
- Do not store chemicals on tops of cabinets.
- Do not store chemicals on the floor, even temporarily.
- Do not store items on bench tops and in laboratory chemical hoods, except when in use.
- Do not store chemicals on shelves above eye level.
- Do not store chemicals with food and drink.
- Do not store chemicals in personal staff refrigerators, even temporarily.
- Do not expose stored chemicals to direct heat or sunlight, or highly variable temperatures.

Proper Use of Chemical Storage Containers

- Never use food containers for chemical storage.
- Make sure all containers are properly closed.
- After each use, carefully wipe down the outside of the container with a paper towel before returning it to the storage area. Properly dispose of the paper towel after use.

Chemical Inventory Management

When ordering chemicals, it is suggested that one do the following:

- Order minimum quantities that are consistent with the rate of use.
- Order only what will be used within a year or less.
- If possible, order reagents in polyethylene bottles or plastic-coated glass bottles to minimize breakage, corrosion, and rust.
Storage and Handling of Compressed Gas Cylinders

Compressed gases can be hazardous because each cylinder contains large amounts of energy and may also have high flammability and toxicity potential.

The following is a list of recommendations for storage, maintenance, and handling of compressed gas cylinders:

- Make sure the contents of the compressed gas cylinder are clearly stenciled or stamped on the cylinder or on a durable label.
- Do not identify a gas cylinder by the manufacturer’s color code.
- Never use cylinders with missing or unreadable labels.
- Check all cylinders for damage before use.
- Be familiar with the properties and hazards of the gas in the cylinder before using.
- Wear appropriate protective eyewear when handling or using compressed gases.
- Use the proper regulator for each gas cylinder.
- Do not tamper with or attempt to repair a gas cylinder regulator.
- Never lubricate, modify, or force cylinder valves.
- Open valves slowly using only wrenches or tools provided by the cylinder supplier directing the cylinder opening away from people.
- Check for leaks around the valve and handle using a soap solution, “snoop” liquid, or an electronic leak detector.
- Close valves and relieve pressure on cylinder regulators when cylinders are not in use.
- Label empty cylinders “EMPTY” or “MT” and date the tag; treat in the same manner that you would if it were full.
- Always attach valve safety caps when storing or moving cylinders.
- Transport cylinders with an approved cart with a safety chain; never move or roll gas cylinders by hand.
- Securely attach all gas cylinders (empty or full) to a wall or laboratory bench with a clamp or chain, or secure in a metal base in an upright position.
• Store cylinders by gas type, separating oxidizing gases from flammable gases by either 20 feet or a 30-minute firewall that is 5 feet high.

APPENDIX E

CHEMICAL – HAZARDOUS MATERIAL LABELING

How Should Chemical Containers Be Labeled?

• No unlabeled substance should be present in the laboratory or classroom - studio at any time!

Labeling Basics

• Use labels with good adhesive.
• Use a permanent marker (waterproof and fade resistant) or laser (not inkjet) printer.
• Print clearly and visibly.
• Replace damaged, faded, or semi-attached labels.

Commercially Packaged Chemicals

Verify that the label contains the following information:

• Chemical name (as it appears on the MSDS)
• Name of chemical manufacturer
• Necessary handling and hazard information

Then Add:

• Date received
• Date first opened
• Expiration or “use by” date (if one is not present)

Secondary Containers and Prepared Solutions

When one transfers a material from the original manufacturer’s container to other vessels, these vessels are referred to as “secondary containers.”

Label all containers used for storage with the following:

• Chemical name (as it appears on the MSDS)
• Name of the chemical manufacturer or person who prepared the solution
• Necessary handling and hazard information
• Concentration or purity
• Date prepared
• Expiration or “use by” date
Containers in Immediate Use
These are chemicals that are to be used within a work shift or a single laboratory session, only. Label all containers in immediate use with the following:

- Chemical name (as it appears on the MSDS)
- Necessary handling and hazard information

Chemical Waste
All containers used for chemical waste should be labeled with the following:
- "WASTE" or "HAZARDOUS WASTE"
- Chemical name (as it appears on the MSDS)
- Accumulation start date
- Hazard(s) associated with the chemical waste

Peroxide-Forming Substance
Peroxide-forming chemical must be labeled with the following:

- Date received
- Date first opened
- Date to be disposed of

NOTE: Some States also require (1) National Fire Protection Association (NFPA) code (refer to APPENDIX B) and/or (2) CAS number to be listed on the label. Consult the State regulations.

National Fire Protection Association Hazard Labels
The National Fire Protection Association (NFPA) has developed a visual guide (right) for a number of chemicals pertinent to the MSDS. The ANSI/NFPA 704 Hazard Identification system, the NFPA diamond, is a quick visual review of the health hazard, flammability, reactivity, and special hazards a chemical may present.

The diamond is broken into four sections (blue, red, yellow, and white). The symbols and numbers in the four sections indicate the degree of hazard associated with a particular chemical or material.
### Health Hazard (Blue)

<table>
<thead>
<tr>
<th>Level</th>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td>Danger</td>
<td>May be fatal on short exposure. Specialized protective equipment required</td>
</tr>
<tr>
<td>3</td>
<td>Warning</td>
<td>Corrosive or toxic. Avoid skin contact or inhalation</td>
</tr>
<tr>
<td>2</td>
<td>Warning</td>
<td>May be harmful if inhaled or absorbed</td>
</tr>
<tr>
<td>1</td>
<td>Caution</td>
<td>May be irritating</td>
</tr>
<tr>
<td>0</td>
<td></td>
<td>No unusual hazard</td>
</tr>
</tbody>
</table>

### Flammability (Red)

<table>
<thead>
<tr>
<th>Level</th>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td>Danger</td>
<td>Flammable gas or extremely flammable liquid</td>
</tr>
<tr>
<td>3</td>
<td>Warning</td>
<td>Combustible liquid flash point below 100 °F</td>
</tr>
<tr>
<td>2</td>
<td>Caution</td>
<td>Combustible liquid flash point of 100 to 200 °F</td>
</tr>
<tr>
<td>1</td>
<td></td>
<td>Combustible if heated</td>
</tr>
<tr>
<td>0</td>
<td></td>
<td>Not combustible</td>
</tr>
</tbody>
</table>

### Reactivity (Yellow)

<table>
<thead>
<tr>
<th>Level</th>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td>Danger</td>
<td>Explosive material at room temperature</td>
</tr>
<tr>
<td>3</td>
<td>Danger</td>
<td>May be explosive if shocked, heated under confinement, or mixed with water</td>
</tr>
<tr>
<td>2</td>
<td>Warning</td>
<td>Unstable or may react violently if mixed with water</td>
</tr>
<tr>
<td>1</td>
<td>Caution</td>
<td>May react if heated or mixed with water but not violently</td>
</tr>
<tr>
<td>0</td>
<td>Stable</td>
<td>Not reactive when mixed with water</td>
</tr>
</tbody>
</table>

### Special Notice Key (White)

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>✱</td>
<td>Water Reactive</td>
</tr>
<tr>
<td>OX</td>
<td>Oxidizing Agent</td>
</tr>
</tbody>
</table>
APPENDIX F
RIGHT TO KNOW POSTER

YOU HAVE THE RIGHT TO KNOW

Employees of the State of Georgia

YOU HAVE THE RIGHT TO KNOW
ABOUT THE HAZARDOUS CHEMICALS
IN YOUR WORKPLACE

Under the "Public Employee Hazardous Chemical Protection and Right to Know Act of 1988" you must be informed of the following:

- The requirements of the Law;
- Your right to receive information regarding hazardous chemicals faced on your job;
- Your right to receive formal training and education on hazardous chemicals;
- What a Material Safety Data Sheet (MSDS) is, and how to use it;
- Where hazardous chemicals are used in your work area;
- Your physician’s right to receive information on the chemicals to which you may be exposed.

YOU CANNOT BE FIRED, DISCRIMINATED AGAINST, OR DISCIPLINED FOR EXERCISING YOUR RIGHT TO KNOW

No pay, position, seniority, or other benefits may be lost for exercising your right to know.

You may present a written request to receive a material Safety Data Sheet for any chemical used on your job.

You have the right to refuse to work with a hazardous chemical if a Material Safety Data Sheet in your employer’s possession has not been provided to you within 5 working days after your written request, unless you are required to perform essential services.

GRIEVANCE PROCEDURE

1. File a grievance through the established procedure for your agency.
2. If unresolved, or if no established grievance procedure exists, then file a grievance with:

   Commissioner of Labor
   c/o Safety Engineering Section
   Georgia Department of Labor
   233 Courtland St., N.E., Suite 301
   Atlanta, Georgia 30303
   (404) 656-2966
### APPENDIX G – COMMONLY USED SAFETY SYMBOLS

<table>
<thead>
<tr>
<th>Flammable</th>
<th>Poison</th>
<th>Explosive</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image1" alt="Flammable Symbol" /></td>
<td><img src="image2" alt="Poison Symbol" /></td>
<td><img src="image3" alt="Explosive Symbol" /></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Ionizing Radiation</th>
<th>Corrosive</th>
<th>Compressed Gas</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image4" alt="Ionizing Radiation Symbol" /></td>
<td><img src="image5" alt="Corrosive Symbol" /></td>
<td><img src="image6" alt="Compressed Gas Symbol" /></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Environmental Hazard</th>
<th>Chronic Health Hazard</th>
<th>Oxidizer</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image7" alt="Environmental Hazard Symbol" /></td>
<td><img src="image8" alt="Chronic Health Hazard Symbol" /></td>
<td><img src="image9" alt="Oxidizer Symbol" /></td>
</tr>
</tbody>
</table>
APPENDIX H

SOURCES FOR ART SAFETY INFORMATION

ACMI Certified Materials – List of over 60,000 products labeled by the Art & Creative Materials Institute as non-toxic – a good place to look for product substitutions to lower exposure risk.  http://www.acminet.org/CPList.pdf

Art Medium Hazards Database – a very good list of different art media and the hazards that they may present to artists. This list was compiled by the City of Tucson as part of a larger project to reduce potential health hazards to area artists.
http://www.ci.tucson.az.us/arthur hazards/medium

Art Studio Safety Guide – Published by United Educators this guide is straight-forward and covers most of the studio art processes in use at GSU:

Hand and Power Tool Safety – The first half of this document provides a good, brief review of the hazards associated with a variety of hand and power tool types.

National Library of Medicine – a good compilation of links and chemical hazard information pertinent to a variety of art mediums.

Nitrocellulose Film Management – Nitrocellulose film (or celluloid film) is extremely flammable and can be unstable if it is not managed properly.
http://www.chicagoartistsresource.org/node/9268
**Noise Exposure** – The CDC has posted a good information page on noise and hearing loss prevention - [http://www.cdc.gov/niosh/topics/noise/](http://www.cdc.gov/niosh/topics/noise/).

This page includes an interactive noise meter to compare a number of common noises - [http://www.cdc.gov/niosh/topics/noise/](http://www.cdc.gov/niosh/topics/noise/), if you are interested in testing your hearing. If you are concerned about noise, the Occupational Health and Safety Officer, Department of Safety and Risk Management, to conduct an evaluation of noise in your area and provide recommendations for hearing protection.

**Right To Know** - is the State of Georgia Law that defines how we warn people of the hazards associated with the chemicals they use and the training they need. All chemicals must be in containers bearing information about the identity of the material and its hazards. Original manufacturer containers carry this information. But if you dispense material into a secondary container you must transfer the identity and hazards of the material to the new container. In addition to the labeling requirement, manufacturers are required to prepare material safety data sheets (MSDS) to detail physical and chemical properties and health effects of their products. [http://www.gsu.edu/auxiliary/38489.html](http://www.gsu.edu/auxiliary/38489.html)

**Welding** – The hazards of welding include eye damage, inhalation of metal fumes, high reactivity of compressed gases, and fire potential. This link takes you to the American Welding Society’s page of fact sheets on welding safety. [http://www.aws.org/w/a/technical/facts/index.html?id=86N93pti](http://www.aws.org/w/a/technical/facts/index.html?id=86N93pti)

**Woodworking Hazards** – a comprehensive overview of woodworking hazards including physical hazards associated with tool use as well as health hazards of wood dust and chemicals used in finishing processes. [http://www.osha.gov/Publications/osha3157.pdf](http://www.osha.gov/Publications/osha3157.pdf)

**MORE ART SAFETY RESOURCES**

**Web Sites**

Books

*Artist Beware* - Michael McCann, PhD, CIH

*The Artist’s Complete Health and Safety Guide*, Monona Rossol, MS, MFA

Art Painting and Drawing by Angela Babin, M.S.

Ceramics by Michael McCann, Ph.D., CIH

*Health Hazards Manual for Artists* - Michael McCann, PhD, CIH

Lithography, Intaglio and Relief Printing by Angela Babin, M.S.; Michael McCann, Ph.D., C.I.H.; and Devora Neumark

*Making Art Safely* - M. Spandorfer, D. Curtiss, J. Snyder, MD

*Overexposure: Photography Hazards* - Susan Shaw and Monona Rossol

Photographic Processing Hazards by Michael McCann, Ph.D., CIH

Woodworking Hazards and Traditional Sculpting Hazards both by Michael McCann, Ph.D., C.I.H. and Angela Babin, M.S.
APPENDIX I
SAFETY POSTERS

SUPERVISION  Never work in the lab without the supervision of a teacher

ATTENTION  Always pay attention to the work—don’t fool around in the lab

FOLLOW INSTRUCTIONS  Always perform experiments precisely as directed by the teacher

EMERGENCY PREPAREDNESS  Know what to do in the event of an emergency

LABELING  Check labels to verify substances before using them. Label Containers

APPAREL  Always wear appropriate protective equipment and apparel

BRAINS  Use them—Safety begins with you

SAFETY DO’S AND DON’TS FOR STUDENTS

[65]
How Should Chemicals Be Stored?

First, identify any specific requirements regarding the storage of chemicals from (1) local, State, and Federal regulations and (2) insurance carriers.

General Rules for Chemical Storage

Criteria for Storage Area
- Store chemicals inside a closeable cabinet or on a sturdy shelf with a front-edge lip to prevent accidents and chemical spills; a ¾-inch front edge lip is recommended.
- Secure shelving to the wall or floor.
- Ensure that all storage areas have doors with locks.
- Keep chemical storage areas off limits to all students.
- Ventilate storage areas adequately.

Organization
- Organize chemicals first by COMPATIBILITY—not alphabetic succession (refer to section titled Suggested Shelf Storage Pattern—next page).
- Store alphabetically within compatible groups.

Chemical Segregation
- Store acids in a dedicated acid cabinet. Nitric acid should be stored alone unless the cabinet provides a separate compartment for nitric acid storage.
- Store highly toxic chemicals in a dedicated, lockable poison cabinet that has been labeled with a highly visible sign.
- Store volatile and odoriferous chemicals in a ventilated cabinet.
- Store flammables in an approved flammable liquid storage cabinet (refer to section titled Suggested Shelf Storage Pattern).
- Store water sensitive chemicals in a watertight cabinet in a cool and dry location segregated from all other chemicals in the laboratory.
**Storage Don’ts**

- Do not place heavy materials, liquid chemicals, and large containers on high shelves.
- Do not store chemicals on tops of cabinets.
- Do not store chemicals on the floor, even temporarily.
- Do not store items on bench tops and in laboratory chemical hoods, except when in use.
- Do not store chemicals on shelves above eye level.
- Do not store chemicals with food and drink.
- Do not store chemicals in personal staff refrigerators, even temporarily.
- Do not expose stored chemicals to direct heat or sunlight, or highly variable temperatures.

**Proper Use of Chemical Storage Containers**

- Never use food containers for chemical storage.
- Make sure all containers are properly closed.
- After each use, carefully wipe down the outside of the container with a paper towel before returning it to the storage area. Properly dispose of the paper towel after use.