SAFETY PROCEDURES FOR GENERAL LABORATORIES

General Safety Policy for Students in Introductory, General, and Analytical Chemistry Laboratories
CLAB 103, CLAB 104, CLAB 123, CLAB 124, CLAB 256, CLAB 456

EMERGENCIES–In case of an emergency when the instructor is unavailable or incapacitated, call University Police at 2222 using the laboratory telephone. When using a cell phone, it is necessary to dial (985)-549-2222.

CONDITIONS OF YOUR WORK AREA
You should maintain a work area that is free of unnecessary equipment, books, coats, purses, excess chemicals, and trash. Keep aisles and exits unobstructed. Books, coats, purses and other personal belongings should be stored in the cabinets beneath the counters. Reagents should be returned to the proper location. At conclusion of lab, clean all used glassware and bench top and replace all equipment in proper location. Before you leave the lab, be prepared to have your station inspected by your instructor.

CHEMICAL SPILLS
All chemical spills should be cleaned up immediately by the proper procedure (if you do not know the correct procedure, notify your instructor for instructions).

EYE PROTECTION
Safety goggles must be worn at all times when you are in the laboratory. Contact lenses are not recommended, however ACS indicates that these lenses are acceptable with proper safety goggles. It is required that you wear safety goggles over your regular prescription glasses.

DISPOSAL OF WASTE MATERIALS
Waste chemicals are to be discarded in the properly labeled waste container. BE SURE TO READ THE LABEL ON THE WASTE CONTAINER. Broken glass and syringes should be placed in the broken glass container. Waste paper, towels, and other trash should be discarded in the waste baskets.

PIPETTING LIQUIDS
Always use a rubber suction bulb or a syringe attached to the pipette to fill the pipette. NEVER USE YOUR MOUTH TO DO THE WORK OF THE SUCTION BULB OR SYRINGE.

HEATING MATERIALS
Make sure that a boiling stone or stir bar is contained in all liquids before heating. When heating materials in a test tube, always point the opening of the container away from yourself and others. Point the opening toward the back of the hood or up toward the splash guard that runs the length of the work bench. Never heat a closed (sealed) container. Never place your face over a material which is being heated. This includes liquids or solids, beakers, test tubes, and Erlenmeyer flasks. The hot material could contact your face and cause chemical and/or thermal burns. Never heat a flammable substance over an open flame. Never leave an experiment that is being heated unattended.

OPEN FLAMES
Have open flames (Bunsen burners, lighters, matches) **ONLY** when the instructor or the lab manual specifically tells you to do so.

EATING OR DRINKING
Since there is a possibility of food substance becoming contaminated with toxic chemicals, no eating or drinking will be allowed in any of the laboratories. No chewing gum or hard candy. Never taste any chemicals from the laboratory.

SMOKING
Smoking is not allowed in any building on campus.

CONDUCTING EXPERIMENTS
Under no circumstances will you be allowed to conduct experiments that have not been assigned for you to do or to work in the lab alone without proper supervision. If you need to leave the lab during class, you should notify the instructor. Do not leave an experiment unattended.

FIRE IN THE LABORATORY
Call out "FIRE" and get away from the fire. **Notify the instructor.** Your safety is the number one priority. Some small fires may be extinguished as discussed the first day of lab. Medium to Large fires will require evacuation of the building. Pull the fire alarm, and then evacuate the building.

EVACUATION
In case of evacuation, leave behind all personal objects, leave the room by nearest exit and proceed directly to Azalea Circle. Evacuation Routes are posted adjacent to all classroom exit doors. Check in with instructor at Azalea Circle to ensure your safety and verify that no rescue is necessary. Do not leave until told to do so.

FIRE ON A PERSON
If your clothing or hair catches fire, DO NOT RUN. Running only fans the flames and makes them burn faster and hotter. Go immediately to and use the safety shower and call out for help. Stay under the shower until the fire is out and the skin temperature has cooled down. If you are in a lab where a person is on fire, it is your responsibility to help that person get under the safety shower and assist them in any way that you can. NEVER USE A FIRE EXTINGUISHER ON A PERSON.

CHEMICAL SPILLS ON

Remember that speed in washing to remove the chemical is most important in reducing the extent of injury. Wash off the contaminated area immediately. Notify the Laboratory Coordinator.

YOUR EYES
Immediately go to the eye wash station and while holding your eye open, irrigate the eye completely for at least 15-30 minutes. Report to the Student Health Center.

YOUR HANDS OR ARMS
Immediately go to the sink and wash your hands until they are no longer contaminated. If a chemical burn has occurred, notify the Lab Coordinator and report to the Health Center. Always wash your hands before you leave the laboratory.

YOUR BODY
Immediately go to the safety showers, pull the shower lever, and with the water running remove any contaminated clothing. Stay under the shower until all of the contamination has been washed away. Notify the Lab Coordinator and report to the Health Center.

OTHER INJURIES
In the event that you or your lab partner cuts themselves or burns themselves, you should notify your instructor immediately.

CHEMICALS
Never use a chemical from an unlabeled container. Never substitute a chemical in an experiment without the instructor's permission. Always treat unfamiliar chemicals as dangerous.

FUME HOOD
When dispensing or working with volatile chemicals, it is recommended to do so in the fume hood. Be sure that the hood is operating by observing that the flow meter is indicating in the green. Never place any body part other than your hands inside the fume hood. When working in fume hood, keep the sash line between you and the material being manipulated. Never dispense chemicals on the air foil sill of the hood. This creates a potential spill hazard and interrupts proper air flow.

PREGNANCY/ALLERGY/CHEMICAL SENSITIVITY
Due to the possibility of contact with chemicals, please self-notify your instructor if you are currently pregnant, have a known allergy or have a known chemical sensitivity or if you develop of any of these conditions during the semester. Additional safety equipment (such as gloves and lab coats) may be put in place. You may be forbidden from participating in select labs.

HEALTH CONDITIONS
If you have a condition that may impact the safety of yourself or others in the lab (such as fainting spells, seizures, tremors, etc) notify your instructor. Special safety practices may be put in place.

HAZARD COMMUNICATION
While academic laboratories do not fall under the purview of OSHA, students graduating in the sciences are likely to be hired into positions were a basic knowledge of chemical safety and its hazard communication are expected and required by law. OSHA Hazard Communications Standard 29 CFR 1910.1200 requires written communication of the hazards associated with chemicals, proper labeling of hazardous chemicals and access to safety data sheets, and safety training.

Written Communication – In this course, the most important hazards associated with each

laboratory experiment are listed at the beginning each procedure. Additional written safety information for each substance can be found in safety data sheets that are kept in a binder in each laboratory. Students should know the location of this binder. In most cases, instructors will also inform students of specific dangers for each experiment during pre-laboratory lectures.

Labeling and Safety Data Sheets – Chemical stock bottles will be labeled with the name of the substance (concentrations are generally included for mixtures), a signal word, and its hazard class. Signal words are **DANGER** for significant hazards and **WARNING** for lesser hazards. The hazard class describes the nature of the physical or health hazard associated with a substance such as flammable, carcinogen, or acute toxin and may be shown in words or pictograms. **Safety Data Sheets** (SDS) were formerly called material safety data sheets and are often still referred to as MSDS. The SDS for a substance is a 16-section written document provided by its manufacturer. You should be familiar with the format of the SDS so that you can find necessary information in the event of an emergency. Each section is briefly described below and an example SDS is given in the appendix of this laboratory manual.

Section 1 Identification: contents and manufacturer information
Section 2 Hazard Identification: hazard class, signal word, pictograms, and precautions
Section 3 Composition: chemical name (with synonyms) and concentration of each substance
Section 4 First Aid Information: description of symptoms and first aid instructions by exposure
Section 5 Fire-fighting Information: extinguishing equipment and personal protective equipment
Section 6 Accidental Release Measures: information on clean-up of spills
Section 7 Handling and Storage: types of containers and incompatible chemical classes
Section 8 Exposure Controls/Personal Protection: exposure limits and PPE
Section 9 Physical and Chemical Properties: appearance, melting points, boiling points, etc.
Section 10 Stability and Reactivity: stable or unstable conditions, conditions to avoid, etc.
Section 11 Toxicological Information: exposure routes, toxicity data (LD_{50}), and symptoms
Section 12 Ecological Information: species specific toxicity, bioaccumulation information, etc.
Section 13 Disposal Considerations: recommended disposal containers and procedures
Section 14 Transport Information
Section 15 Regulatory Information
Section 16 Other Information

Global Harmonized System Pictograms – OSHA hazard communications policies are consistent with the United Nations' Globally Harmonized System of Classification and Labelling of Chemicals (**GHS**). The system employs a series of pictograms. You should be familiar with the GHS pictograms shown below and their associated hazards.

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Flammable
Flammable and pyrophoric substances and those that produce flammable gases by reaction with water


Explosive
Explosive and self-reactive substances


Oxidizer
Substances that act as strong oxidizing agents allowing combustion in the absence of oxygen


Corrosive
Substances that are corrosive to metal or cause skin/eye damage


Compressed Gases
Gases and liquified gases stored under pressure
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<td>Physical Hazards</td>
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Toxic
Acutely toxic substances when ingested, inhaled, or absorbed through skin that cause severe damage or death


Health Hazard
Substances that adversely affect health such as acute and chronic damage to specific organs, mutagens, and carcinogens


Irritant
Substances that cause respiratory, skin, and eye irritation or less severe acute toxicity
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<td>Health Hazards</td>
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Environmentally Damaging
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<td>Environmental Hazards</td>
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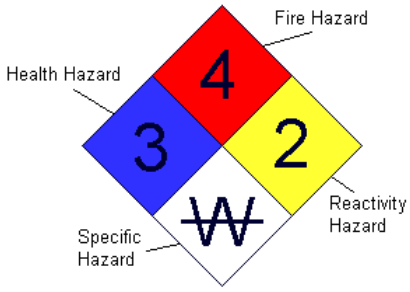
Acute and chronic environmetal damage	

Non-GHS Hazard Communication – Many chemical labels and SDS will contain other hazard communication methods in addition to GHS. Two common methods are NFPA (National Fire Protection Association) and HMIS (Hazardous Material Identification System). Older labels may not include the newer GHS pictograms and information necessitating that students be familiar with these methods.

NFPA Diamonds – The NFPA system uses a series of three colored diamond shapes (shown below) containing a number from 0 to 4. The diamond at the left will be blue and the number identifies the level of health risk; the diamond at the top will be red and describes the substance's flammability; and the diamond at the right will be yellow and indicates a substance's instability or reactivity. Higher numbers represent a greater degree of danger. The diamond at the bottom will be white and is used for special information. The specific descriptions of the hazards represented by the numbers in each diamond is available in the appendix of this laboratory manual.



HMIS Color Bar – The HMIS system is similar to the NFPA diamond except the information is arranged as a stack of colored bars (shown below) containing a number from 0 to 4. The top of the label may identify the substance. The first bar will be blue and represents the health hazard; the second bar will be red and describes the substance's flammability; the third bar will be yellow or orange and indicates the physical and reactivity hazards of a substance; and the last bar will be white and provides information on the necessary personal protective equipment used when handling a substance. As with the NFPA system, larger numbers mean greater danger. Specific descriptions for the hazards represented by each bar and number are available in the appendix of this laboratory manual

Training – The training component of the OHSA Hazard Communication Standard is met through the safety training each student receives at the beginning of each laboratory course at Southeastern.

LAB ATTIRE

Safe laboratory practices mandate proper attire for handling unknown or hazardous chemicals. Departmental policy forbids students from entering the lab if they are non-compliant with safety policy (including attire items 1-7 below). The department is not required to provide make up labs due to safety non-compliance.

1. ALWAYS wear eye protection.
2. DO NOT wear sandals or open-toe shoes.
3. If you have long hair, pull it back in a bun or a pony-tail
4. If you have long, baggy sleeves roll them up or bind them close.
5. DO NOT wear nylon hose.
6. DO NOT wear shorts, short skirts, short shirts, low pants or other clothing that leaves excess skin exposed.
7. All skin that would normally be covered by a below the knee length lab coat, needs to be covered when wearing street clothing in the lab.

In the event of inappropriate clothing, the student may remedy the situation by changing clothes or wearing of a lab coat. Alternative clothes may be may be purchased from the union bookstore. A limited amount of lab coats may be available for borrowing. Disposable lab coats are available for purchase from the Retail Bookstore located in the Student Union.

Students are forbidden from working in the lab in a non-safety-compliant manner.

This Safety Policy is by no means a complete and absolute statement of laboratory safety instructions. Your instructor will periodically point out other safety precautions.