Lab Safety Policy and Procedures, the Annotated (Teacher's) Edition

Concordia College strives to make your laboratory class a safe environment. Towards this goal, your Laboratory Instructor will conduct a laboratory safety orientation. This form includes some basic directions for your personal protection, but you should be aware that your greatest protection comes directly from your own actions. Learn how to protect yourself and others by *preventing* accidents or spills. Monitor the actions of your neighbors as well as your own.

Keep Safety First. Although most labs pose little or no health or safety risk to students, some do involve hazards including the use of compounds that are toxic or corrosive. If you don't understand the potential hazards of any chemical used in the laboratory, ask your instructor. It is essential that you prepare for each experiment by reading materials provided by your instructor before entering the laboratory. Not only will this ensure that you get the maximum benefit from the experience, but it will also make a safer laboratory environment for everyone.

Required Lab Attire:

- **Wear appropriate clothing to lab.** It is unwise to wear nice clothing to lab—if you must, please consider wearing a lab apron or lab coat. You will likely end up with acid holes in your clothes, no matter how careful you are. Natural fibers such as cotton or wool are recommended for safety: synthetic fibers such as polyester or nylon are often more flammable, and melt when exposed to a flame—you don't want melted clothing fused to your skin—OUCH! If anyone is considering purchasing a lab coat, please feel free to send them to Allison. For many chemistry applications, 100% cotton or flame-retardant Nomex are the best choices, and snaps are greatly preferred over buttons in case the lab coat needs to be quickly shed if there's been a chemical spill. Other materials may be satisfactory in certain types of labs, depending on hazards present.
- **Shoes that completely cover your feet should be worn in the laboratory at all times to protect from chemical spills and broken glass.** The shoe should not be perforated and should cover your instep--no sandals, ballet flats, flip-flops, etc. High heels are not safe in the lab and should be avoided. Of primary concern is that the front portion of the foot be covered. Open-backed shoes, while not desirable due to reduced stability on the foot are, nonetheless acceptable.
- **Clothing that fully covers your torso and legs should be worn in the laboratory at all times to protect you from chemical burns on the skin.** Please refrain from wearing shorts or skirts. If they do not come to lab dressed appropriately, students should be sent home to change. Let Allison know if we need to have a few pairs of sweatpants available from the stockroom.
- **Confine loose clothing and long hair.** Loose clothing can knock over glassware, drag through spills, etc. Long hair should be tied up or back to prevent it catching on fire or getting caught in equipment. Long or overabundant jewelry might also be of concern on occasion, as well as long acrylic fingernails (which are quite flammable!). Use your best judgement, given the lab situation.
- **Approved eye protection must be worn at all times.** Every student in the laboratory must wear approved eye protection until everyone has finished with the experimental procedure and has put away all glassware. "Appropriate" is determined by hazards present; splash goggles may be required in some chemistry labs, while safety glasses (with side shields) or "Visorgog"-type may be sufficient. Please consult with Allison. Chemicals such as concentrated nitric acid or a strong base like sodium hydroxide can do irreparable damage to the eyeball in literally a second. Under Minnesota law, Concordia College is legally responsible for eye accidents if a student is not wearing eye protection. An instructor may dismiss from the laboratory any student not wearing approved eye protection. (MN Public Law, section 126.20)

Lab Cleanliness Rules:

- **Store all backpacks, jackets, textbooks, and/or any items not needed for the experiment in the designated storage area.** The only items on your laboratory bench should be your laboratory notebook, laboratory manual, pen, and necessary laboratory equipment.
- **Laboratory areas must never be used for eating or drinking.** All food and beverages must remain in a purse, book bag, or backpack. Never put anything in your mouth when working with chemicals—even the ends of pens! Avoid rubbing your eyes or touching your face when in the laboratory. Wash your hands thoroughly after handling chemicals and before exiting the lab. Wear disposable gloves when appropriate, but remove gloves before touching keyboards, door handles, or shared equipment in the laboratory. If having your students use gloves, **please try to enforce this culture of conscientiousness**—they should remove gloves as soon as is reasonable, and not spread "lab goo" all over shared surfaces.
- **Keep your work area neat and free of clutter.** If you spill a chemical, IMMEDIATELY ask your instructor's advice on cleaning it up. Leaving spills on the counter or balance exposes you and others to chemicals. Take as much time as necessary to clean up a spill. The course of action for cleaning up spills will vary, depending on the substance. Hopefully you know what is hazardous and what is not so bad…if you have any questions, please see Allison. It's a good idea to do a quick check that all balances are clean at the end of each lab to prevent any corrosion from unaddressed spills. Be sure to check under the balance pan! Generally it is OK to use solvents such as methanol and isopropanol on the metal, glass and plastic parts; acetone can be used in a pinch, but not on certain types of plastics. If you need advice on the best ways to clean balances, see Allison.
- **Discard all sharp objects in the proper disposal container.** Containers designated for the disposal of sharps (scalpel blades, razor blades, needles, etc.) and containers designated for broken glass are present in each laboratory. Never dispose of any sharp object in the regular trash. Do not clean up broken glassware yourself—ask for help so we can ensure that all glass shards are picked up and that nobody gets hurt or cut in the process. Each lab should have at least one "Broken Glass bin", a bench brush and dustpan, and a pair of leather gloves. Sharps containers will be in appropriate labs. For replacements, please see Allison.
- **Clean up:** Upon completion of the laboratory experiment and before leaving the laboratory, clean off your laboratory bench with the appropriate cleaning agents and return all equipment and glassware. PLEASE ENSURE THIS IS DONE, particularly if someone else teaches in the lab after you!

Accident/Injury Prevention:

- **Know the location of the following safety equipment, and how to use them properly:**
  - ☐ Safety shower
  - ☐ Eyewash
  - ☐ Fume hoods
  - ☐ Fire extinguisher
  - ☐ Fire blanket also used if person is in shock or if clothing has been removed due to chemical spill
  - ☐ First-Aid kit
  - ☐ Room and fire exits
  - ☐ Closest running water
  - ☐ Safety Data Sheets

    the binders of printed SDS will likely live somewhere on 3rd floor
- **Horseplay, pranks, and practical jokes will not be tolerated during lab.** These forms of mischief are especially dangerous and are prohibited.
- **Perform no unauthorized experiments.**
- **Safe functioning in the laboratory requires concentration.** Please refrain from texting during lab. Use of headphones or earbuds is <u>not</u> permitted during the laboratory period.

- **Check potentially hot objects before touching them.** Hot plates, glassware and other hot objects often do not look hot, but could have temperatures of several hundred degrees.
- **Never fill a pipet by using "mouth suction".** Always use a rubber pipetting bulb to fill your pipet. Never point and squeeze a pipet bulb at yourself or anyone else.
- **Your instructor will inform you of specific safety hazards in each experiment.** Pay strict attention to these warnings in addition to the above rules.

Spill/Accident Procedures:

- **In case of any chemical spill in or near your eyes,** rinse your eyes with copious amounts of flowing water from the eyewash fountain for 15-20 minutes. Ask for assistance immediately. Do not rub your eyes; keep eyes open while rinsing with water.
- **In case of any chemical spill on the skin or clothing,** rinse with copious amounts of flowing water from the sink or safety shower for 15-20 minutes. For minor spills, using the sink is appropriate, however, for spills that cover larger portions of the body, use the safety shower. For heat burns on the skin, also rinse with copious amounts of flowing cold water from the sink. If you desire training on the eyewash, safety shower, fire extinguisher or any other safety equipment, contact Allison.
- **Please inform the instructor immediately of any mercury spill.** Do not attempt to clean up any mercury spill on your own. Broken mercury thermometers should not be placed in the glass disposal container. The principal danger comes from breathing mercury vapor. Most mercury thermometers, manometers, etc. have been replaced with safer alternatives. However, should there be any mercury items still in use, there should be a Mercury Spill Kit in the vicinity; alternately, in a pinch one can sprinkle the area of the mercury spill with powdered zinc or sulfur, then VERY carefully and slowly swept up. Ventilation (fume hoods) should be turned off as soon as the mercury spill happens. All affected clothing as well as sweepings should be double-bagged and taped shut, and will be treated as hazardous waste. **If at all possible, contact Allison in the case of a mercury spill!**
- **All accidents, injuries or fires must be reported at once to the laboratory instructor.** Use your head and don't overreact—most lab fires are easily smothered or extinguish by themselves. Always let your instructor know if you injure yourself--no matter how small—so it doesn't become a larger issue later. Use your judgement—don't let a fire get out of hand before you call 911. Note all injuries; fill out an Accident Report Form for pretty much anything bigger than the most-superficial of paper cuts, especially if chemicals are being used. Recommend a Band-Aid and/or disposable glove and/or trip to Health Center as necessary. If sending a student to Health Center, send a second student along even if the injured student appears fine. . If injury is potentially serious, it should be reported to our Risk Management Office: https://www.concordiacollege.edu/directories/offices-services/risk-management/incident-report/ Likely a good idea if injury is more than just superficial (i.e. more than just a couple drops of blood), and especially if student has been working with chemicals that could be harmful if they entered the body or bloodstream.
- **In an evacuation,** turn off heat sources you are using and leave the room in an orderly manner. Assemble with your instructor and wait for further instructions. Stay with your class until you have been given permission to leave. If no evacuation guidelines are known, use your best judgement depending on the situation. Open lawns are best in case of fires; underground or interior shelter for tornadoes.

Sharps, Chemical & Waste Procedures:

- **Containers of chemicals or other reagents may not be taken out of the laboratory classroom.** Inform your instructor if a chemical container needs to be refilled, or if an additional waste container

is needed. Do not overfill waste containers. For waste containers, please leave at least 2-3" of space from the lip of the bottle or jug.

- **Never return excess material to reagent bottles.** By doing so, you risk contaminating the entire bottle of reagent, and jeopardizing the experiments of all. Make it a practice to not take much more material than is required for the experiment because many chemicals are quite expensive.
- **Do not take reagent bottles back to your workspace.** This is a matter of courtesy to the other students in the class, and it minimizes the likelihood of contaminating the reagent. It is also much safer not to have students carrying large amounts of chemicals around the laboratory.
- **Exercise great care when checking for chemical odors.** Always use your hand to waft vapors toward your nose.
- **Sharp objects such as pointed dissection probes, scalpels, razor blades, scissors, and microtome knives must be used with great care, and placed in a safe position when not in use.**
- **Do not dispose of solid wastes in the sinks.**
- **Do not dispose of chemicals or biohazardous materials in the sinks.**
- **All contaminated material, such as slides, coverslips, toothpicks, lancets, alcohol swabs, etc. must be placed in a biohazard bag for proper disposal and should never be reused.**
- **Do not overfill waste collection containers.**
- **Fume Hood:** All operations in which noxious or poisonous gases are used or produced must be performed inside a fume hood. Work should be done as far back in the hood as is possible (at least 6 inches back from the front edge), and the sash should be kept as low as possible—this maximizes the flow of vapors up the hood and away from you.
- **Hazardous Waste:** Proper procedures given by your instructor must be followed for collection of hazardous wastes. In general, there will be at least one waste container in the designated waste hood for collection of the experiment waste streams. Do not pour any chemicals or waste solutions down the drain unless specifically instructed to do so, and **never** mix acid waste with organic waste. If you have questions, please see Allison.
- **Be alert to unsafe conditions,** and report them to the lab instructor so that corrective action can be taken. Prevent accidents by using common sense and being well-informed. Your instructor will inform you of specific safety hazards in each experiment. Pay strict attention to these warnings in addition to the above rules. If you have questions, please see Allison.
- **Carefully read all labels on chemical bottles.** They have important safety information for your benefit and right-to-know. For more in depth information, consult the Safety Data Sheet (SDS) for the chemical; hard copies of SDS are available at the Chemical Stockroom (ISC 138) or can be found online at a place such as http://hazard.com/msds/index.php
- **It is recommended that students who have recently conceived, are anticipating conception, or those concerned about reproductive toxins discuss the course content and reagents with their physician.** In the case of certain labs, mutagenic and teratogenic chemicals are used. [Mutagens are substances that can cause a change or mutation in the genetic material of a living cell. Teratogens can cause injury or deformity in unborn children after absorption of the substance by the pregnant mother.] Information on reproductive toxins in use in specific labs can be obtained from the instructor in charge of the lab. If you have questions, please see Allison.
- **Students with medical conditions, especially—but not limited to—those which may cause sudden loss of consciousness should inform the instructor at the beginning of the semester, or as soon as aware of the existence of the condition.** If you have questions, please see Allison.

Additional Safety Rules Specific to this Course:

Safety Policy and Procedures Signature Sheet

(initial each item)

_____I have read all of the material in the Safety Policy and Procedures handout.

_____I understand the general safety policies and the eye protection policy, and recognize that it is my responsibility to abide by them faithfully.

_____I have asked for clarification of those points I did not understand.

_____I am aware that any violation of this safety contract that results in unsafe conduct in the laboratory will subject me to possible disciplinary action. (Disciplinary action may include—but is not limited to—reprimand, dismissal from lab for the day, grade penalization, or dismissal from the course.)

Students should retain one copy of this signature sheet in lab notebook or online.
Your lab instructor will collect one printed signed copy, which will be kept on file by the Science Safety Officer for a period of 7 years as required by law.

Signed:_____ Date:_____

Print name legibly:_____
Please check that the name is, indeed, legible.

Department and Course Number: _____

Faculty Member:_____ Date:_____

Comments: