NJCSTM Basic Laboratory Safety Guidelines

General Lab Safety:

PROTECT YOUR HEALTH: Never eat, drink, smoke, chew gum, apply lip balm, or put anything in or on your eyes, nose, or mouth while in a laboratory. *This includes water bottles and coffee/tea; keep them out of the labs.* Chemicals and biologicals in a lab are not to be ingested in any way, nor should glassware or any other lab materials be used for food or drink.

CONTAIN YOURSELF. Tie back long hair, avoid wearing dangly sleeves, earrings, pendants, bracelets, or anything else that will interfere with your work or become contaminated or electrified. Do not engage in horseplay or roughhousing in any laboratory at any time. Put your backpack and personal items in a safe place out of the way of spills and traffic flow.

AVOID DISTRACTIONS. Laboratory work requires that you focus on what you are doing. Be aware that phones can become a medium for chemical or biological contamination and should be kept in a pocket or away from the workbench if being used as a timer or manual.

Personal Protective Equipment (PPE) is to be used at all times when working with chemicals and biologicals, and are to be left in the lab to avoid spreading contamination.

COVER YOUR SKIN. Lab coats should be worn while you are in the lab. In addition, clothing should cover any other exposed body parts; this includes wearing long pants and covered shoes (sandals, open mesh, and open-toed shoes are not protective) while in the lab. Remove your lab coat when you leave the lab.

PROTECT YOUR EYES. Goggles or safety glasses should be worn whenever you are working with liquids or chemicals, or when projectiles or other hazards are possible. Contact lenses are not recommended to be used in a laboratory setting. If you decide to wear contact lenses, you should *always* wear your safety glasses in the lab.

PROTECT YOUR FACE. Wear a face-shield or use a chemical fume hood for protection. This is necessary when working with hazards such as pouring or pipeting hazardous liquids, working with heating chemicals, working with cryogens, or other dangers. Safety glasses should be worn with the face shield when needed.

PROTECT YOUR HANDS: WEAR GLOVES. Whenever you are working with chemicals or biologicals, you should wear protective gloves. Remove any rings, as they can tear gloves. For some chemicals, latex gloves are inadequate, as these chemicals will pass across latex and contact your skin; use nitrile or other appropriate gloves as directed. Some chemicals require two layers of gloves. If you get chemicals onto your gloves, replace them as soon as practicable. If you are working with hot materials, dry ice, or liquid nitrogen, or will be retrieving materials from a freezer, wear insulated gloves for protection. If working with chemicals or biologicals, REMOVE YOUR GLOVES BEFORE LEAVING THE LAB – don't spread contamination.

KNOW WHERE SAFETY EQUIPMENT CAN BE FOUND. All labs have eyewash stations, and most have emergency drench showers. Note where the nearest ones are to your lab bench. If you splash a chemical in your eyes or on your skin, *notify your supervisor* and get help removing the chemical.

To use an eyewash station, pull toward you, then hold open the affected eye(s) and flush with water for at least 10-15 minutes to remove all of the chemical; the units can also be used to flush chemicals off the skin. Once you have flushed the area, seek medical attention for evaluation.

Emergency showers are for large-scale splashes or body fires that require a whole-body drenching; keep in mind that they are only for appropriate emergencies: at a 20-30 gallons per minute flow rate, the cleanup is a messy one.

Chemical Spill kits are available on each floor in the prep rooms. If you have a spill, notify your supervisor immediately, and they will use the kit to contain and neutralize the spill. Even if you spill a small amount of a chemical, ask the Safety Officer's advice in cleaning it up: some chemicals cannot simply be wiped up and must be treated as a hazard.

Fire extinguishers are available in each lab, but are only to be used by trained personnel If you notice a fire, notify your coworkers immediately, and be prepared to evacuate the area should it become necessary. If the fire is large or spreading at all, evacuate the area and pull the fire alarm near the stairs for help.

Never block access to emergency equipment or emergency exits with chairs, carts, boxes, packs, or any other objects. Keep aisles and walkways free of tripping hazards and obstructions. Impeding access, even temporarily, is dangerous. Exit doors should never be blocked or locked in any way.

FIRE SAFETY: Know your exit routes! Have your personal belongings nearby at all times. In case of evacuation, use the stairs (not elevators) to exit the building. The STEM building evacuation assembly area is the grounds between STEM and Morris Avenue. *Please report there to your supervisor so we know everyone has left the building.*

ON FIRE? STOP, DROP AND ROLL! The goal is to extinguish the flames by smothering them. Running or panicking will provide the air to increase the flames. Drop to the floor and roll the flames out, get help from a colleague to smother the flames with a lab coat or other material. Do not use a fire blanket while standing up, as this creates a funnel effect and can result in facial burns. Use an emergency drench shower if the flames are out of control. If you are burned, seek medical attention.

INJURED? Seek medical attention ASAP. The nearest medical facility is Overlook Medical Center, 1000 Galloping Hill Road, Union. *If you or your colleague are seriously hurt, bleeding profusely, or cannot stand or walk to help, dial 911 for emergency assistance*. On campus, 911 will go to campus dispatch; on a cell phone, identify your location (Kean University, STEM Building, Union, NJ) so they can put you through to appropriate local emergency personnel.

USE THE BUDDY SYSTEM. Never work alone in a laboratory, especially when working with hazardous chemicals or biologicals or with heat sources such as flames. Make sure someone is nearby to help you in case of an emergency.

CHEMICAL SAFETY: If you are using chemicals on a regular basis, you should read the Laboratory Safety Manual general section that deal with chemicals as well as reading the Chemical Hygiene Plan. *Briefly*:

Use appropriate PPE and know your chemicals. Read the **Safety Data Sheets** (MSDS/SDS) on any chemical you question. Ask your lab instructor for directions and information. You can also obtain SDS information online at www.hazard.com/msds *SDS contain important information about the hazards of chemicals you are working with so you can be aware of potential hazards.*

Chemicals should be properly carried. If moving chemicals outside the lab, they should be carried in a secondary container which can contain the entire contents should a break or spill occur.

Chemicals MUST be properly stored. Do not store acids near bases, or organic chemicals near combustible agents. Never store flammables in quantities greater than 500mL outside a Flammables Cabinet, and make sure they all fit into the cabinet in an upright and stable manner. Fluids should always be stored in a secondary containment system in case the original container fails. Waste bottles should be in secondary containers, monitored, replaced when 5/6 full and appropriately labeled for disposal.

Chemicals MUST be properly labeled for storage. If you make a solution or aliquot of a chemical, be sure to label with:

Name of chemical and its carrier/solvent. Concentration (if appropriate).
Date (mm/dd/yy)
Course number/name.
Name of person who made the chemical or is using it.
If storage is overnight or longer, the CAS* number should be included.
(*Chemical Abstract Service)

Chemicals MUST be properly disposed of. Follow the SDS guidelines for where to put waste chemicals. Hazardous chemicals must be disposed of as Hazardous Waste. DO NOT POUR CHEMICALS DOWN THE DRAIN AND DO NOT PUT CHEMICALS IN THE TRASH. There are few chemicals which can be handled this way; contact the CSTM Safety Officer for information.

Never heat volatile chemicals over an open flame. Use a water bath and/or hot plate.
Never start a suction hose or pipet with your mouth.
Do not "sniff" to test chemicals or inhale chemical vapors.
Do not pour gels or liquid agar or agarose down the drains.

KEEP YOUR WORK STATION TIDY: this keeps your work area cleaner and safer, since you can more readily control possible spills, contamination, and other hazards. Dispose of debris in the proper containers and remove materials you are finished with as you work.

Do not leave materials behind when you use common instruments or equipment, be sure to put items away and leave the area clean and tidy. This includes making sure your PCR tubes and gels are disposed of after you are finished and areas are wiped clean.

BIOLOGICAL HAZARDS: if you are working with biologicals such as bacteria or cell cultures, you should read the LSM and the Blood Borne Pathogens Exposure Control Plan. Biological materials, including microbial cultures, cell cultures, DNA/RNA, and other biological materials, are treated as Regulated Medical Waste in CSTM. They must be autoclaved and sent out for incineration according to state and federal regulations.

AVOID CONTAMINATION: When working with biologicals, be sure to decontaminate any surfaces after you are done, using 10% bleach or 70% alcohol. Labs which work with biological materials should decontaminate lab surfaces regularly. If you transfer cultures or gels containing biologicals between labs, you must use a secondary containment system (e.g. lidded dish or enclosed bin) when transferring from one lab to another, and have at least one hand clean and ungloved to handle any buttons or latches in the common areas (i.e. outside the labs).

BLOODBORNE PATHOGENS: If you are working with human or mammalian cell cultures or any human blood or blood products, you should be aware of the Bloodborne Pathogens Control Plan and possible exposure to hazards like Hepatitis B. See OSHA info sheet at www.osha.gov/OshDoc/data_BloodborneFacts/bbfact05.pdf or the BBP-ECP in the NCSTM Lab Safety Manual. Vaccines are available for Hep B.

SHARPS HAZARDS: sharp objects such as needles, syringes (regardless of use or whether a needle is attached), scalpels/blades, capillary tubes, and biologically contaminated glassware such as slides and culture plates must be disposed of in an appropriate Biohazardous Sharps Container, which is labeled specifically for the safe disposal of such hazards. Biohazardous sharps must be disposed of in a hard-sided collection bin and then in Regulated Medical Waste.

"Clean" broken glass may be disposed of in a broken glass sharps box. Broken glassware should be picked up with a broom and dustbin or forceps, NOT with the hands, to avoid lacerations. Never place sharps of any kind in the regular trash.

REPRODUCTIVE HAZARDS: Reproductive hazards are substances or agents that may affect the reproductive health of women or men or the ability of couples to have healthy children. Efforts have been made to eliminate the use of known reproductive hazards in NJCSTM. However, the vast majority of laboratory chemicals have never been tested by the manufacturer or by any governmental agency. As a result, their effect on a developing fetus is unknown; personnel must assume that each chemical used in a lab presents a hazard to an unborn child.

If you are pregnant, become pregnant or are planning to become pregnant while working in a laboratory, you are strongly encouraged to speak privately with your supervisor, who will be able to provide written health and safety information about each chemical that will be used in the lab (MSDS). You are asked to review and discuss this information with your healthcare provider.

WASH YOUR HANDS. Wash them coming into the lab to keep the lab clean of contaminants, and wash them again after taking off gloves to keep contaminants from leaving the lab. While hand sterilizing agents have their place, the lab isn't one of them; washing hands removes materials you don't want to have accompany you elsewhere. Use warm running water and soap, and be sure to clean all hand surfaces thoroughly.

ELECTRICAL HAZARDS. Do not handle electrical devices or plugs with wet hands or while standing in water. Do not use any device which has frayed cords or exposed wiring. Notify your supervisor if any of the equipment seems faulty. Do not use cell phone chargers in lab outlets.

USE OF SPECIAL EQUIPMENT & MATERIALS

GET PROPERLY TRAINED ON EQUIPMENT: Specialized equipment requires training to use properly. Be sure to be trained – it can be dangerous and costly if something goes wrong. ASK if you have *any* questions or concerns or feel uncomfortable using lab equipment.

CHEMICAL (FUME) HOODS: Use chemical hoods whenever a volatile or hazardous chemical is involved. Keep the hood front sash at a level which allows work but minimizes exposure to splashes, spills, and possible explosions; the red marker should be highest level for the sash during under-hood work. Do not use lightweight materials such as paper or paper toweling in a hood where it can get sucked into the airstream. Keep your head and upper body out of the hood when using chemicals. Keep materials in the hood at least 6 inches from the front panel to ensure vapors do not enter the classroom. Do not store large quantities of materials under fume hoods, especially hoods where work is being performed. Do not block airflow - keep materials at least 6 inches from back of hood. Promptly wipe up any spills. Close the hood to storage level when done.

BIOLOGICAL SAFETY CABINETS: Use Biological Safety Cabinets for reducing contamination of biological materials and for containing biological materials within an area. BSCs allow easier chemical decontamination of surfaces and many use disinfecting UV lights when not in use to further reduce contamination. Do not use while UV lights are on. Keep your upper body and head out of the cabinet while in use. Use appropriate PPE (lab coat & gloves, at minimum). Make sure the BSC you use has passed inspection.

CENTRIFUGES: Centrifuges spin at a high rate of speed and, if not balanced, can cause a catastrophic failure, damaging equipment and harming individuals. You **must** be properly trained to use one. Do not run without a balanced load and work away from the machine while it is in motion. Be sure to wipe up any spills immediately, to avoid spread, solidification and/or corrosion of the machine/containers. Any corrosive, hazardous, or biological materials should only be centrifuged when appropriate secondary containment systems and lids are in place.

STEM BIOTECH OR ANALYTICAL EQUIPMENT: Specialized biotech equipment that belongs to CSTM, such as PCR machines, incubators, flow cytometers, documentation devices, and chemistry analytical equipment, require appropriate training for use. Please contact the CSTM Safety Officer for information.

The CSTM SAFETY OFFICER is Nan Perigo, who can be reached by email at nperigo@kean.edu, phone 908-737-7227, or visiting STEM 118. You can also put a note in Nan's mailbox in STEM 513. Please contact her if you have any questions or concerns.

The Kean University Environmental Safety Office, home of the KU Safety Office and the Chemical Hygiene Officer, can be reached at 908-737-4804. They can answer technical or other questions as well.

You can read the NJCSTM Laboratory Safety Manual, the Chemical Hygiene Plan, and the Blood-borne Pathogens Exposure Control Plan online at www.kean.edu/academics/nj-center-science-technology-and-mathematics/laboratory-safety This site also includes a training video for basic lab safety in CSTM. This video can be found directly at vimeo.com/362781511

Your supervisor may have additional training or information for safety in the lab. ILSE labs may use Stericycle training videos as appropriate.

Please sign the agreement on the next page and return it to the Safety Officer – via mailbox in STEM 513 or the office in STEM 118.

LAB SAFETY AGREEMENT

I have read and understand the basic Laboratory Safety Procedures outlined above, have received a safety briefing, and will read the appropriate sections of the NJCSTM Laboratory Safety Manual in order to better understand the general safety procedures and fire safety practices here in the STEM building at Kean University.

I understand that any research I do in NJCSTM is subject to rules contained within the NJCSTM Laboratory Safety Manual as well as within the lab in which I work. I will endeavor to educate myself about these rules and follow them. If I handle hazardous materials, chemicals, or biologicals, I will read about how to handle them safely in the Chemical Hygiene Plan and the Blood-Borne Pathogens Exposure Control Plan, both of which are available in the NJCSTM Laboratory Safety Manual binder in my lab and online.

I will contact the NJCSTM Safety Officer, Nan Perigo, in case of any questions regarding procedures or other concerns. (nperigo@kean.edu, 908-737-7227, or visit room 118)

I agree to abide by the STEM safety guidelines, outlined above and in this Safety Packet, to keep myself and my colleagues safe in the laboratories in which I work.

Print Name	*Signature*	*Date*

Email address	*Phone*

Company	*Supervisor*

This form is to be completed and signed, then given to the STEM Safety Officer to be put on file in the STEM Safety Office. The information packet attached should be retained for reference.