NJCSTM
New Jersey Center for Science, Technology & Mathematics

Laboratory Safety Manual

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NJCSTM Laboratory Safety Manual

Introduction

In order to maintain a safe working environment, certain protocols, rules, and laws govern behavior and use of materials and equipment in scientific laboratories. They are designed to keep workers, the buildings they work in, and the overall environment safe. These protocols are outlined here in the NJCSTM Laboratory Safety Manual (LSM) and detailed information can be found in the Chemical Hygiene Plan (CHP) (yellow section) and the Bloodborne Pathogens Exposure Control Plan (ECP) (pink section). Please familiarize yourself with these documents and plan to attend an Orientation Session prior to beginning work in the laboratory.

The Standards used in NJCSTM laboratories adhere to those guidelines and rules established by the NJ and U.S. Occupational Safety and Health Administration (OSHA), specifically to the Laboratory Standard found at
https://www.osha.gov/Publications/laboratory/OSHA3404laboratory-safety-guidance.pdf

Section 1: General Laboratory Procedures –

Outline of contents

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Section 1: General Laboratory Procedures:

1. Laboratory Signage
    a. Each laboratory should have posted outside the door an information sheet that shows the following:
        i. Name of Laboratory /Person responsible
        ii. Contact information for responsible personnel in case of laboratory emergency or other issue.
        iii. "In case of emergency, contact Campus Police x74800 (908-737-4800)"
        iv. "Building Facilities Manager, Alonso Losada, can be reached at alosada@kean.edu, x75848 or cell 908-377-5803"
        v. MSDS Information may be found in STEM 118 or online at http://www.msds.com/.

2. Laboratory Security
    a. Doors to the laboratories should be locked at all times in order to restrict access to dangerous materials and equipment, and to maintain a safe environment. DO NOT block open doors, and do not allow entry to unauthorized personnel.
    b. When you are the last to leave, you should make sure all equipment is turned OFF, all chemicals are properly sealed, all hoods are closed, and all materials and equipment are properly stored/closed/checked. Double check all doors to make sure they are locked on your way out.

3. Safety Audit Procedures
    a. Safety Audits will be conducted formally on a semi-annual basis and informally on a weekly "walk through" basis by the Research Facilities Manager or other safety officer.
    b. Formal Safety Audits will include inspections of chemical/biological storage & use areas, hood flow, biological safety cabinet use, and general application to the requirements detailed in the Chemical Hygiene Plan (CHP) and the NJCSTM Lab Safety Manual.
    c. An audit checklist is available from the STEM Safety Officer, room 1-18.

4. Procedures for Working Alone

   a. Generally, laboratory work should be done with other people around for safety; if something happens to an individual, someone else can render aid or call for assistance.
   b. Prior to working alone in the laboratory, inform your supervisor where you will be working, for approximately how long, and what materials and equipment you will be working with. Your supervisor must approve of you working alone in the lab in the circumstances outlined.
   c. In many circumstances (e.g. working with hazardous chemicals, pressurized gases, or other hazards), working alone is unsafe, and arrangements must be made to ensure that someone else is nearby to help in an emergency.
   d. No student is to work alone without supervision in a laboratory.
   e. NJCSTM/ILSE will not be held responsible for personnel working under unsafe conditions without appropriate supervision or monitoring.

5. Guidelines for Laboratory Workers Under the Age of 18

   Workers under the age of 18 are NEVER to be left alone in a laboratory or exposed to hazardous chemicals or biologicals at any time.

6. Prior Approval Procedures for Unattended Operations

   a. If it becomes necessary to leave during a process or operation (such as running a gel, etc.), responsible personnel should inform their Supervisor and the Research Facilities Manager (x77227) on where and what the process is, how long it will continue to be unattended, and how to terminate the process should an emergency arise.
   b. For unattended operations, laboratory lights should be left on, and signs should be posted to identify the nature of the experiment and the materials in use.
   c. Arrangements should be made, if possible, for other workers to periodically inspect the operation. Information should be clearly posted indicating who to contact in the event of an emergency.
   d. Depending on the nature of the procedure, special rules, precautions, and alert systems may be necessary.
   e. Procedures that should NOT be left unattended include, but are not limited to:
      1. Open flames of any kind;
      2. The use of any compressed liquid or gas cylinder in an unregulated manner;
      3. Volatilization/evaporation of chemicals;
      4. Any procedure which involves toxic, flammable, or hazardous materials.

7. Disposal of Unwanted Equipment
    a. Unwanted equipment is to be turned over to the Research Facilities Manager for storage or disposal.
    b. Equipment which has been contaminated by chemical or biological materials must be decontaminated prior to disposal or storage.
    c. Please contact x77227 for more information.

8. Chemical Hood Inspections and Use
    a. Chemical (fume) hoods will be inspected each year by a Safety Officer or certification agency to check appropriate flow and use. Notification will be given to the lab supervisor/responsible party prior to inspections in order to reduce interruption of work time.
    b. Hoods which fail inspection may not be used until they are repaired; hoods without a current inspection sticker/approval should not be used until they have passed inspection.
    c. Hoods which are new or have been moved to a new location must pass inspection prior to use.
    d. See SOP #21 of the Chemical Hygiene Plan for proper use of Chemical Fume Hoods.
    e. Employees are to be made aware of Chemical Fume Hood emergency override switches in the laboratory (near the doors) for emergency evacuation of volatile materials.

9. Procedures in the Event of a Loss of Utilities (Water, Electric….)
    a. Immediately notify Alonso Losada, the Building Facilities Manager, of the loss of (specify) utility (alosada@kean.edu, x75848 or c 908-377-5803) and the STEM Safety Officer (x908-737-7227).
    b. If any laboratory procedures are in progress, shut down any procedures requiring the lost utility and stabilize the procedure as much as possible.
    c. If electricity is lost to the entire room and the chemical hoods are not functioning, make sure any chemicals under the hoods are closed and the hoods themselves are closed.
    d. Turn off all devices which will have issues with a loss of power so that when the power comes back on, someone can turn them back on in a controlled manner.
    e. <u>If the loss of the utility causes a safety concern,</u> Campus Police (x74800 or 908-737-4800) should be informed and the area evacuated if necessary.

10. Accident and 'Near Miss' Reporting Procedures
    a. Any time an accident occurs, an Accident and Incident report should be submitted to the STEM Safety Office, x77227, STEM room 118.
    b. "Near miss" incidents should also be reported, in order to determine if additional engineering or other safeguards need to be instituted for safety improvements.

11. Reproductive Hazards and Declared Pregnancy

    a. 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.
    b. Efforts have been made to eliminate the use of known reproductive hazards in our labs. 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; female lab workers must assume that each chemical used in the lab presents a hazard to an unborn child.
    c. If you are pregnant, become pregnant or are planning to become pregnant during the course of your work, 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.
    d. After you have reviewed the information, you can choose to:
        i. Continue your work in the lab - You will be asked to sign a waiver and will be expected to follow a strict set of health and safety procedures while in the lab.
        ii. Withdraw from lab work - Your supervisor may assist you in creating a plan to complete the work at a later date or to find alternative work.

12. Medical Consultation and Medical Surveillance

    a. Employers are required to provide free medical consultation with a licensed healthcare professional for the purpose of determining what medical examinations or procedures are appropriate in cases where a significant exposure to a hazardous substance may have taken place, including:

        i. Whenever an individual develops signs or symptoms associated with a hazardous chemical to which he or she may have been exposed in the laboratory;

ii. Whenever exposure monitoring reveals exposure levels routinely exceeding the OSHA action level or permissible exposure limit, as appropriate;
iii. Whenever a spill, leak, explosion or other occurrence results in the likelihood of a laboratory worker experiencing a hazardous exposure.

b. The laboratory worker or his/her supervisor provides the examining physician with the identity of the hazardous chemical encountered in the laboratory and the conditions under which the individual may have been exposed.

c. The examining physician completes a written opinion that includes the following information:
   i. Recommendations for further medical follow-up;
   ii. The results of the medical examination and any associated tests;
   iii. Any medical condition which may be revealed in the course of the examination that may place the individual at increased risk as a result of exposure to a hazardous chemical in the workplace.

e. A copy of the written opinion is provided to the laboratory worker, and to the STEM Chemical Hygiene & Safety Officer. Arrangements must be made to keep such records on file for 30 years. Further details on the policy and procedures may be found in the NJCSTM Chemical Hygiene Plan (CHP).

f. Any work which may require exposure to Blood Borne Pathogens or human cells or tissues must follow the recommendations found in the BBP section of this manual, specifically with regard to the use of biological safety hoods, PPE, and availability of Hepatitis B vaccination. BBP prohibits exposure of workers under 18 years of age.

13. Hazardous Waste Management –

Details available in the Chemical Hygiene Plan & the Biological Safety section.

a. Waste Management
   i. As outlined in the Chemical Hygiene Plan, hazardous waste production will be minimized as much as possible.
   ii. Solid biohazardous waste, such as biologically contaminated plasticware or other materials, will be collected in an appropriate Biohazard container at the point of use. When the Biohazard container is full, the bag will be loosely sealed and autoclaved to inactivate any biological material present.

b. Waste Storage
    i. Liquid chemical waste will be stored in a Hazardous Waste container appropriate for its storage and combination with other chemical(s);
        1. Full liquid chemical waste containers will be collected in the bunker for storage prior to disposal. Please call 908-737-7227 for pickup or information.
        2. Waste MUST be correctly labeled for storage and disposal. Labels must contain complete names, no abbreviations, of chemicals.
        3. The following Hazardous Chemical Waste label should be used and properly filled out:

HAZARDOUS CHEMICAL WASTE

Container Full Date:

Generator's Name/Phone:

Bldg/Room Number

Chemical Name: (no abbreviations) Approx.% by wt (Must total 100%)

    ii. Solid chemical waste (powders, filters, etc), will be placed in an appropriate bag or other container and labeled with contents, then stored in the bunker until disposal.
    iii. Solid biological waste will be treated (autoclaved), then packaged as Regulated Medical Waste (red bag), stored in the bunker, and sent for incineration by a licensed medical waste disposal company.

c. Waste Disposal
    i. After inactivation/decontamination, waste will be periodically collected by a contracted waste disposal vendor and disposed of according to state and federal law.
    ii. Solid Biological Waste will be disposed of by a company contracted by the tenant company or by contract through the NJCSTM Safety Office.
    iii. Chemical Waste will be disposed of by the Chemical Hygiene & Safety Officer via a company contracted by Kean or ILSE (depending on source).
    iv. Manifests will be produced for each container of waste indicating the contents and manner of inactivation/decontamination; see CHP for details. A copy of each manifest will be filed with the STEM Safety Office.

d. ILSE waste handling, storage, and disposal fees will be charged to tenant accounts. STEM waste is disposed of by Kean Environmental Services.

14. Selection of Personal Protective Equipment (PPE)

a. Generally, appropriate PPE for each task will include:

i. Lab coat at all times while working in the lab.

ii. Eye protection (goggles, possibly face shield) when working with chemicals or any liquids.

iii. Gloves (nitrile when working with chemicals; latex or vinyl are adequate when working with biologicals).

b. More specifically, select PPE appropriate to task at hand:

See table 1.1 (following) for guidance.

Table 1.1

Task	**Gloves**	**Eye Protection**	**Face Shield**	**Gown or Apron**	**Surgical -Type Mask**	**Lab Coat**	**CPR Mask**	**Foot Covering**
Administering First Aid.	Yes	As needed	As needed	As needed	As needed	As needed	As needed	As needed
Cleaning up a spill of blood or other body fluids.	Yes	As needed	As needed	As needed	As needed	As needed	No	As needed
Transfer of chemicals or caustic/ hazardous liquids	Yes, nitrile	Yes	As needed	As needed	As needed	Yes	No	As needed
Use of frozen materials at 0^{o}C or below	Yes, cryo-gloves	Yes	As needed	As needed	As needed	Yes	No	As needed
General work within a lab handling chemicals of any type	Yes	Yes	As needed	As needed	As needed	Yes	No	As needed
General work within a lab handling biological materials of any type	Yes	As needed	As needed	As needed	As needed	Yes	No	As needed
Handling human blood or other human-derived materials, including human cell lines in a classroom or laboratory setting.	Yes	Yes	As needed	As needed	As needed	Yes	No	No

Handling or laundering uniforms, towels, or other items potentially contaminated with blood or body fluids.	Yes	No	No	As needed	No	As needed	No	No

c. **Required Work Practices when wearing PPE**

i. Wash hands immediately or as soon as feasible using clean running water and soap after removal of gloves or other personal protective equipment. In the case of biological contamination, hand sanitizer may be used in field situations where soap and water are not readily available and the hands are not visibly soiled. Wash with running water as soon as possible on return from the field.

ii. Remove protective equipment before leaving the work area and after a garment becomes contaminated.

iii. Place used protective equipment in appropriately designated areas or containers to be stored, washed, decontaminated, or discarded.

iv. Wear appropriate gloves when it can be reasonably anticipated that you may have contact with blood or other potentially infectious materials and when handling or touching contaminated items or surfaces. Replace gloves if torn, punctured, contaminated, or if their ability to function as a barrier is compromised.

v. Following any contact of body areas with blood or any other infectious materials, you must wash your hands and any other exposed skin with soap and water as soon as possible. Employees must also flush exposed mucous membranes (eyes, mouth, etc) with water.

vi. Discard utility gloves when they show signs of cracking, peeling, tearing, puncturing, or deterioration.

vii. Never wash or decontaminate disposable gloves for reuse or before disposal.

viii. Wear appropriate face and eye protection such as a mask with glasses with solid side shields or a chin-length face shield when splashes, sprays, splatters, or droplets of blood or other potentially infectious materials pose a hazard to the eye, nose, or mouth.

ix. If a garment is penetrated by blood and other potentially infectious materials, the garment(s) must be removed immediately or as soon as feasible. If a pullover scrub (as opposed to scrubs with snap closures) becomes minimally contaminated, employees should be trained to

remove the pullover scrub in such a way as to avoid contact with the outer surface; e.g., rolling up the garment as it is pulled toward the head for removal. However, if the amount of blood exposure is such that the blood penetrates the scrub and contaminates the inner surface, not only is it impossible to remove the scrub without exposure to blood, but the penetration itself would constitute exposure. It may be prudent to train employees to cut such a contaminated scrub to aid removal and prevent exposure to the face.

d. Repair and/or replacement of PPE will be at no cost to employees.

15. Additional Precautions for the Use of Particularly Hazardous Substances

a. Hazardous substances (chemical or biological in origin) are to be handled according to Safe and Prudent Practices as outlined in the Chemical Hygiene Plan.
b. Substances which are severe explosion hazards, radioactive substances, or are substances which are considered pathogens at the Biohazard III level or above, are not allowed on the premises.

16. Training

a. Each employee will be oriented to the safe and prudent practices used in the laboratory prior to beginning work in the laboratory.
b. This training will include general laboratory practices, lab safety, fire safety, and the chemical and biological hazards to which they may be exposed.
c. See the Safety Officer for additional information.

17. Training Procedures

a. There will be an orientation and basic safety training for all employees to inform them of the safety features of the STEM building, basic safety protocols, and fire safety information. Additional training will be available for employees who will be exposed to specific hazards.
b. Each employee who has or is reasonably anticipated to have occupational exposure to bloodborne pathogens will receive training conducted by the Safety Officer or a qualified individual or online program designated by the employer.
c. The training program will cover, at a minimum, the following elements:
    i. Basic safety protocols.
    ii. Chemical safety protocols and use of the Chemical Hygiene Plan.
    iii. Access to a copy of the Laboratory Standard and explanation of its contents.

iv. Epidemiology and symptoms of bloodborne pathogens.
v. Modes of transmission.
vi. Details of the facility's Exposure Control Plan and how to obtain a copy.
vii. Methods to recognize exposure tasks and other activities that may involve exposure to blood.
viii. Use and limitations of Engineering Controls, Work Practices, and PPE.
ix. PPE - types, use, location, removal, handling, decontamination, and disposal.
x. PPE - the basis for selection.
xi. Information on the Hepatitis B vaccine program. Training will be given prior to vaccination on its safety, effectiveness, benefits, and method of administration.
xii. Emergency procedures for occupational incidents involving exposures to blood and other potentially infectious materials.
xiii. Post-exposure evaluation and follow-up information and procedures
xiv. Signs and labels used in this facility.
xv. Questions and answers session.

d. An Employee Education and Training Record will be completed for each employee upon completion of training. This document will be kept in the STEM Safety office.

18. Resources:

Kean Environmental Health & Safety Office (EHS):
http://www.kean.edu/offices/university-police/office-environmental-health-and-safety

Occupational Safety and Health Administration (OSHA)
https://www.osha.gov/pls/publications/publication.athruz?pType=Industry&pID=117

ACS Safety in Academic Chemistry Laboratories
https://www.acs.org/content/dam/acsorg/about/governance/committees/chemicalsafety/publications/safety-in-academic-chemistry-laboratories-students.pdf?_ga=2.201125611.418523934.1530546774-1077698160.1530217874

Section 2: Electrical Safety

Generally, use caution when working with electrical devices and instrumentation.

1. Use only equipment that is properly grounded or double-insulated.
2. Only use equipment that has been approved by a national testing laboratory. For a full list of approved labs, see www.osha.gov/dts/otpca/nrtl/nrtllist.html
3. Do not overload outlets. Check the voltage on your instruments before you add another item to an outlet.
4. Do not plug multi-outlet bars to other multi-outlet bars.
5. Minimize the use of extension cords. Do not plug two extension cords together.
6. Do not cover power cords or extension cords with rugs or mats, as this can cause issues with the wires or create potential tripping hazards.
7. Do not run electrical cords through pedestrian aisles, as this creates tripping hazards.
8. Unplug or disconnect machines before servicing or repairing, and check to make sure the machine is actually disconnected and turned off prior to service. DO NOT open any electrical device without consulting an instructor or lab manager.
9. Do not ignore warning signs. If an item feels hot, makes an unusual noise (buzz or hum), smokes or sparks, take it out of service immediately and tag it "Do Not Use". Report it to a faculty or staff member right away.
10. Inspect cords and equipment regularly, and report any defects immediately.
11. Cover or guard any exposed electrical components or wires, and make sure students and employees are aware of any hazards.
12. Unplug cords from the outlet by gripping the plug. Do not just pull the cord from a distance.
13. When done working with devices that use a transformer, unplug the transformer if the instrument will be unused for a long period.
14. Do not use electrical equipment or appliances near water or wet surfaces. Never use electrical equipment when your hands or the equipment is wet.
15. Do NOT plug phone chargers in to outlets on benchtops, especially when chemicals or papers are present. Phone chargers are notorious for shorting and exploding without warning, and this can cause a fire. Charge your phone somewhere other than a lab bench.
16. High voltage Electrical devices are in use in some of our laboratories in STEM. These rooms are designated with a "Caution: High Voltage" sign and require authorization to enter. Do not touch any high voltage electrical switches or outlets without permission from the staff or faculty member in charge, and then only when you have been trained to do so.

Section 3: Laboratory Standard - Chemical Safety Program

Contents:

1. Introduction

In 1990, the Occupational Safety and Health Administration (OSHA) issued a regulation entitled Occupational Exposure to Hazardous Chemicals in Laboratories, otherwise known as the Laboratory Standard, to address the differences between chemicals as used in laboratories versus other workplaces.

The goal of the Laboratory Standard is to ensure that laboratory workers are informed about the hazards of chemicals in their workplace and are protected from chemical exposures exceeding allowable levels (e.g., exceeding OSHA Permissible Exposure Limits). This goal is achieved by establishing safe work practices in the laboratories through the implementation of a Chemical Hygiene Plan (safety manual) and the appointment of departmental Chemical Hygiene Officers.

In accordance with the Laboratory Standard, NJCSTM/ILSE has appointed a Chemical Hygiene Officer to develop and implement a departmental Chemical Hygiene Plan. The Chemical Hygiene Officer is the primary liaison for laboratory chemical safety issues between the department and the Office of Environmental Health and Safety (EHS). The CHO is the Safety Officer for the building, housed in STEM 118, x908-737-7227.

2. Scope and Application

The Laboratory Standard applies to all individuals who work with hazardous chemicals in science laboratories. Work with hazardous chemicals outside of laboratories is covered by a Hazard Communication Policy.

3. Procedural Description

The Laboratory Standard consists of these major elements:

1. Hazard identification
2. Exposure monitoring
3. The Chemical Hygiene Plan
4. Information and training
5. Medical consultations and exams
6. Record keeping

4. Hazard Identification

1. Chemical containers must be labeled with the identity of the product, the chemical constituents and their Chemical Abstracts Service (CAS) numbers, and any appropriate hazard warnings. Labels must not be removed or defaced while in use.

2. Material Safety Data Sheets (MSDS) received by the laboratory must be maintained and be available to laboratory workers during work hours. The location of any available central departmental location for MSDS may be found in the Chemical Hygiene Plan. In STEM, the MSDS are housed in STEM 118. MSDS can also be found online at http://hazard.com/msds/index.php or msds.com

5. Exposure Monitoring

1. OSHA has established permissible exposure limits (PELs) for hundreds of chemical substances. The PEL is the concentration of a chemical in inhaled air that the average, healthy worker may be exposed to daily for a lifetime of work without significant adverse health effects. The PEL is usually expressed as an eight hour time-weighted average concentration. Laboratory workers must be protected from exposure above PELs.

2. Exposure monitoring, through air sampling, is conducted if there is reason to believe that exposure may exceed exposure limits, or upon request. Individuals who have been monitored will receive sampling results within 15 days of receipt by the Safety Officer. Periodic monitoring will be conducted as needed.

6. Chemical Hygiene Plan Description

1. The purpose of the Chemical Hygiene Plan is to provide guidelines for prudent practices and procedures for the laboratory use of chemicals.
2. The Laboratory Standard stipulates that the Chemical Hygiene Plan set forth procedures, equipment, personal protective equipment and work practices capable of protecting workers from the health hazards presented by the hazardous chemicals used in the laboratory.
3. NJCSTM/ILSE has developed a Chemical Hygiene Plan (CHP). It can be found in Section 7 (yellow section, Appendix 2A) or under separate cover. Copies of the CHP are available to laboratory workers in the Safety Office, STEM 118, or from their supervisor.

7. Information and Training

1. Laboratory workers are provided with information and training to become knowledgeable of the hazards present in their laboratory.
2. The training is provided at the time of initial assignment to a laboratory and prior to assignments involving new exposure situations.
3. EHS provides general training, while the department provides specific training on particularly hazardous materials or operations in the workplace.
4. All individuals working in a laboratory must attend Laboratory Safety Training.

5. Training includes at least the following:

    a. Methods and observations that may be used to detect the presence or release of a hazardous chemical. This may include monitoring devices, as appropriate, and familiarity with the appearance and odor of the chemicals;
    b. The physical and health hazards of chemicals in the laboratory; and
    c. The measures that workers can take to protect themselves from these hazards, including protective equipment, appropriate work practices, and emergency procedures.

8. Medical Consultations and Examinations

i. Each employer must provide medical consultation with a licensed healthcare professional for the purpose of determining what medical examinations or procedures are appropriate in cases where a significant exposure to a hazardous substance may have taken place, including:

a. Whenever an individual develops signs or symptoms associated with a hazardous chemical to which he or she may have been exposed in the laboratory;
b. Whenever exposure monitoring reveals exposure levels routinely exceeding the OSHA action level or permissible exposure limit, as appropriate;
c. Whenever a spill, leak, explosion or other occurrence results in the likelihood of a laboratory worker experiencing a hazardous exposure.
d. The laboratory worker or his/her supervisor provides the examining physician with the identity of the hazardous chemical encountered in the laboratory and the conditions under which the individual may have been exposed.
e. The examining physician completes a written opinion that includes the following information:
    i. Recommendations for further medical follow-up.
    ii. The results of the medical examination and any associated tests.
    iii. Any medical condition which may be revealed in the course of the examination that may place the individual at increased risk as a result of exposure to a hazardous chemical in the workplace
f. A copy of the written opinion is provided to the laboratory worker and the STEM Safety Officer. Further details on the policy and procedures may be found in the STEM Chemical Hygiene Plan.

9. Recordkeeping

Departments and ILSE companies must keep records of attendance at safety training, exposure monitoring, medical consultation, and examinations. Such records may be transferred to an individual's physician or made available to the laboratory worker upon request.

10. Roles and Responsibilities

NJCSTM/ILSE

1. Appoint a Chemical Hygiene Officer.
2. Maintain records of training, exposure monitoring and medical examinations.
3. Provide chemical and procedure-specific training.

Chemical Hygiene Officer

1. Develop and implement a departmental Chemical Hygiene Plan.
2. Review and update the Chemical Hygiene Plan at least annually.
3. Investigate accidents and chemical exposures.

Supervisors

1. Ensure laboratory workers attend training.
2. Ensure laboratory workers use personal protective equipment, as needed.

Safety Officer

1. Conduct exposure monitoring, as needed.
2. Provide general training.
3. Audit departmental program periodically.

Individual

1. Attend training.
2. Review the STEM Chemical Hygiene Plan.
3. Follow procedures & laboratory practices outlined in the Chemical Hygiene Plan.
4. Use engineering controls and personal protective equipment, as appropriate.
5. Report all accidents and potential chemical exposures.

11. References and Resources

Specialty Lab Safety Guidance Publications

United States Department of Labor - Occupational Health and Safety Administration
www.osha.gov OSHA Laboratory Standard, 29 CFR 1910.1450

Kean University Fire and Environmental Health and Safety web site
http://www.kean.edu/ehs/

ACS Safety in Academic Chemistry Laboratories
https://www.acs.org/content/dam/acsorg/about/governance/committees/chemicalsafety/publications/safety-in-academic-chemistry-laboratories-students.pdf?_ga=2.201125611.418523934.1530546774-1077698160.1530217874

William Paterson University, Department of Chemistry; Chemical Hygiene Program
http://www.wpunj.edu/dotAsset/205513.pdf

12. Section 2 Appendices

Appendix 2A: under (yellow) Section 7: Chemical Hygiene Plan
Appendix 2B: Chemical Waste Handling & Disposal Guidelines

1. Introduction

NJCSTM & ILSE generate small quantities of waste classified as hazardous under state and Federal law. This material is generated as a result of research activities in the STEM building. The management of chemical waste is regulated by several governmental agencies including the United States Environmental Protection Agency, the United States Department of Transportation, and the New Jersey Department of Environmental Protection (NJDEP).

2. Scope and Application

a. The procedure intends to protect individuals and the environment from exposure to hazards during the handling of chemical and hazardous wastes. Teaching and research assistants, and ultimately the designated Scientist-in-Charge of the laboratory, are responsible for compliance with this operating procedure.

b. This policy incorporates requirements set forth in the OSHA standards for handling of hazardous waste (29 CFR 1910.120), Federal RCRA requirements (40 CFR 260-262), and state regulations set forth by the NJDEP in N.J.A.C. 7:26G. This policy applies to all faculty, researchers, staff and students conducting laboratory operations.

c. ILSE is required to comply with these regulations and maintain a safe work and learning environment for students, faculty and staff in the STEM building. Compliance with these regulations in the laboratories is the responsibility of the researcher in charge of that laboratory, who reports safety issues directly to the Safety Officer. Failure to comply with and enforce the departmental waste policies could have serious consequences, including loss of privileges and/or civil and criminal prosecution. Failure to comply may also result in civil, criminal, or administrative penalties for ILSE and its constituent clients.

3. Procedural Description

a. The following <u>chemical waste handling procedures</u> shall be followed in all NJCSTM/ ILSE laboratories:

i NO CHEMICAL OR HAZARDOUS WASTE IS TO BE DISPOSED OF DOWN A DRAIN! The only exceptions to this rule are outlined in the Chemical Hygiene Plan.

ii In addition, the following substances are explicitly prohibited from disposal to the sanitary sewer (RCRA Subpart F):
   (1) Metals: arsenic, cadmium, chromium, copper, lead, mercury, nickel, silver, & zinc.
   (2) Materials with pH <2 or >12.5, volatile organic compounds, or containing cyanide, sulfate, sulfide, oil, or grease.
   (3) Also prohibited are solids or viscous substances in quantities or of such sizes capable of causing obstruction to the flow in the sewers.

b. All waste shall be poured into bottles or containers that are an appropriate size, in good condition, sturdy, leak-proof and compatible with the waste material. Appropriate Personal Protective Equipment compatible with the material being handled must be worn at all times to minimize potential exposure to the waste. This may include, but not be limited to, rubber/butyl gloves, protective goggles, lab coat, apron, and respirator.

c. The bottle or container shall have a tight-fitting cap and shall be sealed at all times, except when additional waste is being added.

d. All old or extraneous labels must be removed or defaced.

e. All hazardous waste containers shall be clearly identified with proper labeling (RCRA Subpart I).

   Labels must include:
   i the words "Hazardous Waste"
   ii a list of all chemical components and their relative quantities. Relative quantities of all chemicals should sum to a total of 100%. (If a waste log is used with the waste container, the relative quantities may be filled in when the container is full. The container label should reference the associated waste log number.)
   iii the primary hazards presented by the waste substance (e.g., flammable, corrosive)
   iv the person responsible for the waste, their location and phone number.

f. The Safety Officer shall be contacted for assistance in handling and disposal of potentially explosive materials such as picric acid, silanes, nitro compounds, and ethers.

g. Certain hazardous chemical wastes are not compatible with other chemicals and may cause a severe reaction, explosion, or release of extremely toxic products. The original chemical’s label and MSDS will contain information on incompatibilities.

i In general, hazardous waste containers should be segregated by hazard class (40 CFR 264.17):

(1) Ignitable/Flammable,
(2) Explosive,
(3) Toxic,
(4) Corrosive,
(5) Concentrated Acid,
(6) Concentrated Base,
(7) Reactive,
(8) Oxidizer, or
(9) Reducer

ii. Compatible substances (including compatible solvents) may be mixed or stored together provided the relative quantities of the different substances are listed on the waste label (for example, "50% Toluene & 50% Isopropanol").

h. Where a number of additions shall be made to a waste container, a waste log is to be used to record information. The waste log must reference the waste container number and for each addition, the waste log should list:

i the name of the chemical and the CAS number that is being added to the container (written in English – no chemical or empirical formulae); DO NOT ABBREVIATE.
ii the quantity and concentration of each chemical that is added;
iii the primary hazards presented by the waste substance;
iv the person responsible for the waste, their location and phone number.

v The information on the waste log must be summarized on the waste container label when the container is full. For further information and an example of a container waste log see SOP 18, "Laboratory Chemical Waste Accumulation."

i. Detailed information with regard to laboratory chemical waste handling, hazardous waste labeling, and laboratory hazardous waste accumulation can be found in the Standard Operating Procedures section of the ILSE Chemical Hygiene Plan.

4. **Roles and Responsibilities**

a. NJCSTM Safety Office

i Identify all activities that could result in the generation of hazardous waste.
ii Ensure that all individual generators of hazardous waste within the STEM building are aware of policies and procedures for proper disposal of hazardous wastes.
iii Distribute information on hazardous waste disposal (including pickup schedules) to all applicable parties.
iv Administer hazardous waste disposal services contracts.
v Provide technical advice on proper waste classification, storage and disposal practices.

vi Maintain disposal records and generate state-required reports of hazardous waste activity.

vii Provide annual Chemical Waste Operations training for those individuals charged with managing waste storage.

b. Supervisors

i Ensure that all individuals involved in activities that generate waste are aware of and follow the waste disposal policies and procedures.

ii Periodically review current practices to minimize the quantities of hazardous waste generated.

iii 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. (See the CHP, SOP #24 for Decommissioning Equipment and Laboratories.)

c. Individual

i Follow established practices for disposal of chemical wastes.

ii Properly dispose of all wastes at the conclusion of a project and before leaving the University. (See the CHP, SOP #24 for Decommissioning Equipment and Laboratories.)

5. Key References and Resources

a. New Jersey Administrative Code (NJAC 7:26-7.1 et seq.) Hazardous Waste, New Jersey Department of Environmental Protection

b. United States Department of Labor
Occupational Health and Safety Administration: www.osha.gov
OSHA Standards for Handling of Hazardous Waste, 29 CFR 1910.120

c. United States Environmental Protection Agency www.epa.gov
RCRA Requirements, 40 CFR 260-262

d. Kean University Fire and Environmental Health and Safety web site
http://www.kean.edu/ehs/

e. William Paterson University – Dept of Chemistry, Chemical Hygiene Plan
http://www.wpunj.edu/dotAsset/205513.pdf

Section 4: Biological Safety

1. Introduction:

Biological materials carry inherent risks to health and well-being, and must be treated with caution and due care. Standard Laboratory Practices and Prudent Practices must be used, and materials must be decontaminated when research is finished. At NJCSTM/ILSE, we maintain BMBL (CDC) practices at BioSafety Levels 1 and 2, which requires a number of basic engineering controls and the limiting of exposure to individuals. We do not have the facilities to support research at BSL 3 or BSL 4.

2. Routes of Exposure

Biological contamination can occur via many routes, including ingestion (swallowing), inhalation, and across the skin (via mucus membranes, injuries, or intact skin).

In order to minimize the risks of exposure, certain laboratory procedures are maintained, including what are called Prudent Practices or Standard Laboratory Practices.

3. Standard Laboratory Practices and Techniques (Prudent Practices)

Standard Laboratory Practices include

1. Engineering Controls,
2. Limiting Exposure to chemicals
3. Safe Laboratory Practices
4. Biohazard Spill Cleanup Processes

1. Engineering Controls include:
   a. limiting access to laboratories via locking doors and cabinets in order to control access by persons who do not need to be exposed to materials within the lab,
   b. the use of Chemical Fume Hoods and Biological Safety Cabinets, and
   c. the availability of emergency equipment, such as emergency drench showers and eyewash stations.

2. Limiting Exposure to chemicals includes the use of
   a. Personal Protective Equipment (PPE) and
   b. Safe Laboratory Practices. By practicing care and awareness in the laboratory, individuals can limit their exposure to potential biological hazards.

3. Safe Laboratory Practices:
   a. Always be aware of the laboratory environment and the possible results of any actions you may take.
   b. Know what you are handling at all times, understand the risks involved and what to do in case of emergency.
   c. Always wear appropriate Personal Protective Equipment. Adhere to the precautions outlined in the Chemical Hygiene Plan when working with chemicals, and use gloves, lab coat, and other shielding PPE (goggles and/or face shields) when working with materials that may splash onto the face or into the mouth.
   d. Always use appropriate pipetting devices. Never pipet with your mouth.
   e. Avoid eating, drinking, smoking, chewing gum, or applying cosmetics or lip balm in the laboratory. Food and drink are not to be stored in the laboratory, nor heated in a laboratory microwave. Do not use toothpicks or put writing implements or other materials into the mouth while in the laboratory.

f. Know where the exits are, and where the emergency shower and eyewash stations are in your lab. Know how to use emergency equipment should the need arise.
g. Keep pathways to exits and areas around emergency equipment clear at all times. Keep your personal items in a nearby place in case of evacuation.
h. Do not work alone in a laboratory; be sure someone is nearby in case of emergency.
i. Keep your work area clean and free of debris to reduce accidental spills and exposures.
j. Wash your hands after using gloves, chemicals, and before leaving the laboratory. Gloves should not be used to open doors or touch buttons/railings.
k. Clean and decontaminate surfaces that may have become contaminated during your work.
l. Know how to properly use equipment. Do not use equipment you have not been trained to use. Do not use electrical equipment with frayed or worn cords or wiring.
m. Use Chemical Fume Hoods when working with volatile or hazardous chemicals.
n. Use a Biological Safety Cabinet (BSC) when appropriate for performing biological work.

4. Biohazard Spill Clean-up Processes
   a. Bleach solutions should not be used on fabric, carpeting, or bare metal surfaces.
   b. Other EPA-registered antimicrobial products such as tuberculocides (EPA List B), sterilants (EPA List A), and products registered against HIV/HBV (EPA List E) may be substituted for the bleach solution. Consult the manufacturer's instructions for use.
   c. For small spills, disposal germicidal wipes can be used. Consult the manufacturer's instructions for use.
   d. Block off the area of the spill until clean-up and disinfection is complete.
   e. Put on eye protection and disposable gloves. Wear shoe covers or water-resistant boots over your shoes if you may step in the spill while cleaning it up.
   f. Prepare a 10% bleach solution – Add one part household bleach to nine parts cool water (1 ½ cups of bleach per gallon of water, or 3 ounces (90 ml) of bleach per 32 ounces (900ml) of water) and gently mix the solution.
   g. Place paper towels over the spill.
   h. Gently pour bleach solution onto the paper towels covering the spill.
   i. Let the bleach solution remain on the spill for 20 minutes.

j. Pick up the paper towels with tongs or a broom and dustpan. Place the waste in a red biohazard bag.
k. Wipe up the remaining bleach solution with paper towels, and place them in the biohazard bag.
l. Wipe the area down with the bleach solution using fresh paper towels, and place the waste in the biohazard bag.
m. Allow the area to air dry.
n. All non-disposable equipment, as tongs, mops, brushes, dust pans, or overboots should be disinfected by soaking with the bleach solution then air dried. Wipe the mop handle with fresh paper towels damped with bleach solution.
o. When finished, remove gloves and shoe covers and place in the biohazard bag with all soiled cleaning materials. Securely tie-up the bag.
p. Thoroughly wash hands with soap and water.
q. Contact the Safety Officer or place materials in Biomedical waste for decontamination and disposal.

5. Laundering of Laboratory Clothing

a. Laboratory clothing which has been contaminated with biological materials can be decontaminated by autoclaving or by washing in hot water and detergent.
b. Lab coats and other materials which have been contaminated with a Biological Hazard MUST be autoclaved prior to cleaning and exposure to others. Place the contaminated material in a biohazard bag for autoclaving, afterward the item can be processed in hot water and detergent.
c. With regard to contaminated personal protective equipment, OSHA has stated in CPL 02-02-069 XIII.D.16, that “Home laundering of contaminated items is unacceptable because the employer cannot ensure that proper handling or laundering procedures are being followed and because contamination could migrate to the homes of employees." Employers are responsible for cleaning, laundering and/or disposing of personal protective equipment [29 CFR 1910.1030(d)(3)(iv)].
d. Contaminated Laundry Handling Procedures
    i. Laboratory supervisors will clean or replace items, at their discretion, at no cost to the employee.
    ii. Soiled leather items (belts, shoes, gloves) will be scrubbed clean using a brush and hot water or discarded in red bag waste when contaminated.
    iii. Use appropriate personal protective equipment when handling contaminated laundry.
    iv. Place wet contaminated laundry in leak-proof, labeled or color-coded containers or bags before transporting.

v. Bag contaminated laundry at its location of use. Do not sort or rinse contaminated laundry in areas of its use.
vi. Use red laundry bags or those marked with the biohazard symbol; all employees should recognize the bags as contaminated and should be trained in handling the bags.
vii. If contaminated laundry is sent off-site, the Laboratory will determine if the receiving facility uses universal precautions. If universal precautions are not used, then place the contaminated laundry in autoclave bags for decontamination prior to sending for cleaning.
viii. When handling and/or sorting contaminated/potentially contaminated laundry, gloves and other appropriate personal protective equipment shall be worn.
ix. Handle contaminated laundry as little as possible and with a minimum of agitation.
x. Dry cleaning is an acceptable method for decontamination.
xi. If hot water is used, linen should be washed with detergent in water at least 140^{o}F - 160^{o}F for 25 minutes. If low-temperature (<140^{o}F) laundry cycles are used, chemicals suitable for low-temperature washing should be used at proper decontamination concentration.

6. Waste Management: Categories of Biological Waste and Acceptable Treatments
   a. Regulated Medical Waste
      i. Some wastes associated with biological materials must be disposed of in special ways because they may have been contaminated with infectious organisms or agents. These potentially infectious or biohazardous materials are defined by NJ regulations as Regulated Medical Waste.
      ii. These wastes include, but are not limited to, the following:
         1. all sharps, e.g. glass implements, needles, syringes, blades, etc. coming from facilities using infectious materials (designated in CSTM labs as “BioHazardous Sharps” in a red hard-sided bin);
         2. biologically-cultured stocks and plates, human blood or tissues (designated in CSTM labs in Biohazardous Waste bags or bins);
         3. certain wastes from patient care (generally not applicable in CSTM);
      iii. In addition, wastes generated from animal care facilities are also handled separately from the general waste stream.

b. Scope and Application
    i. This policy describes the proper biological waste packaging, labeling and handling procedures. The policy incorporates the Federal standard of the Occupational Safety and Health Administration (OSHA) "Exposure to Bloodborne Pathogens" (29 CFR 1910.1030), the Federal standard for the Interstate Transport of Etiologic Agents (42 CFR 72.6), and the Comprehensive Regulated Medical Waste Management Act (N.J.A.C. 7:26-3).

c. Procedural Description
    i. Biological waste is any waste that is potentially bio-hazardous, infectious or pathological. If regulated biological waste is mixed with non-hazardous solid wastes the waste stream shall be managed as biological waste.

d. Packaging Biological Waste for Disposal
    i. Where possible, biological waste should be decontaminated prior to disposal. Methods of decontamination include autoclaving (steam pressure sterilization) and bleaching (10% bleach solution).
    ii. All biological waste collected for disposal will be placed in a securely closed, watertight container
        1. A primary container (test tube, vial, etc.) which shall be enclosed in a second, durable, watertight container (secondary container) that is double-lined with two regulation biohazard plastic bags.
    iii. Note: Biological sharps will be placed in an OSHA-approved sharps container prior to being placed in with the biological waste.
    iv. The space at the top, bottom, and sides between the primary and secondary containers shall contain sufficient non-particulate absorbent material (e.g. paper toweling) to absorb the entire contents of the primary waste container(s) in case of breakage or leakage.
    v. The plastic bags must be of sufficient strength to prevent ripping or tearing (3- millimeter equivalent) and must be labeled with an appropriate “Biohazard” symbol and a label with the following information:
        1. Etiologic Agent(s)
        2. Biomedical Material
        3. “In case of damage or leakage notify CDC, Atlanta, Georgia (404) 633-5313”

vi. If dry ice is used as a refrigerant, it must be placed outside the secondary container and within the plastic bags. If dry ice is used between the secondary container and the outer shipping container, the shock absorbent material shall be placed so that the secondary container does not become loose inside the outer shipping container as the dry ice sublimates. See Appendix C for shipping regulations regarding Dry Ice.

vii. Employers should provide all boxes, bags, tape and labels to be used for packaging of biological waste.

e. Disposal:

i. When the biological waste container is full, or the maximum weight limit of the container is reached, the following procedures will be followed:

1. Ensure the packaged waste is within the weight limits indicated on the container
2. Seal or tie each bag
3. Label the outer box with appropriate identification label (lab ID, date, material, whether waste has been decontaminated).
4. Securely close each container with 3 strips of tape on top, bottom, and side seams.

ii. Immediately notify the company waste manager that a container is ready for pick-up.

iii. Under no circumstances are biological wastes to be mixed with normal non-hazardous refuse. In the unlikely event that laboratory waste is inadvertently mixed with regular garbage, segregate the waste container to the best of your ability, and delineate the entire container as biological waste.

iv. Label and date the outer container upon pickup.

v. When possible, animal waste should remain frozen until a pick-up has been scheduled with the disposal contractor.

vi. A container that is leaking, improperly packaged, improperly labeled or containing loose sharps cannot be picked up by biomedical waste disposal vendors.

vii. ILSE tenants must either arrange for ILSE to store and dispose of biological materials as Regulated Medical Waste or contract directly with a licensed disposal company. Copies of manifests must be provided to the Safety Officer for records on file in the Safety Office.

f. Biological Sharps Handling

i. Sharp materials (sharps) that have been used in animal or human patient care, treatment or research, present the double hazard of inflicting injury and inducing disease. Since sharps can easily cut or puncture skin or plastic bags, they need to be disposed in puncture proof containers. OSHA standards specify handling procedures for sharp materials to protect against exposure to physical and biological hazards, while 42 CFR 72.6 details packaging and storage requirements for sharp materials.

ii. Scope and Application: This policy defines the proper handling procedures for sharp materials used in ILSE laboratories. The policy incorporates regulations set forth in the "Interstate Shipment of Etiologic Agents" standard (42 CFR 72.6), the OSHA standards for "Exposure to Bloodborne Pathogens" (29 CFR 1910.1030), and ILSE requirements.

iii. Procedural Description

1. Definition of Sharps: The regulatory definition of sharps includes all discarded needles, syringes (with or without the attached needle), blades, scalpels, vials, culture dishes (regardless of the presence of infectious agents), slides and cover slips, and broken glass. All sharps used in patient care, treatment or research are considered infectious waste because of the possibility of undiagnosed blood-borne diseases (i.e., Hepatitis or AIDS). In addition, unused discarded hypodermic needles, suture needles, syringes, and scalpel blades are always considered biological waste.

iv. Disposal of Sharps

1. Sharps should be segregated by contamination type (i.e. “clean” broken glass, biohazardous, hazardous, and radioactive (no radioactive substances allowed in STEM).
2. If unsure of the contamination type, contact the STEM Safety Officer for assistance.

v. Biohazardous Sharps only:

1. Place sharps in a red OSHA-approved sharps container.
2. Place a biohazard label and Lab ID label on the sharps container. Place the sharps container in the lined biohazardous (RMW) waste container.

vi. Hazardous and Biohazardous Sharps:
    1. Place sharps in red OSHA-approved sharps container.
    2. Place a biohazard label and the lab's Medical Waste Generator ID number on the sharps container.
    3. Place a "Hazardous Waste" label on the sharps container next to the biohazard and Medical Waste Generator ID labels.

vii. Consult with the STEM Safety Office for disposal procedures or dispose of Biomedical waste through your vendor.

g. Non-biological, non-hazardous broken laboratory glassware (i.e. broken glassware, such as bottles, flasks, pipettes, and vials that do not meet the criteria for hazardous, biological, or radioactive waste):
    i. Place in a heavy duty box (or glass "Sharps" box specifically for this purpose) and securely seal the box.
    ii. Label the box "CAUTION: broken glassware".
    iii. Place the box in storage for bulk sharps disposal.
    iv. LABORATORY GLASSWARE MUST NEVER BE DISCARDED IN THE GLASS RECYCLING BINS.

7. Biosafety Levels (BSL):

a. The essential elements of the four biosafety levels for activities involving infectious microorganisms and laboratory animals are summarized here. The levels are designated in ascending order, by degree of protection provided to personnel, the environment, and the community. Standard microbiological practices are common to all laboratories. Special microbiological practices enhance worker safety, environmental protection, and address the risk of handling agents requiring increasing levels of containment. Additional detailed information is available upon request from the NJCSTM Safety Officer or from the CDC at http://www.cdc.gov/biosafety/publications/bmbl5/BMBL.pdf

b. The STEM building does not support nor allow research above the level of BSL-2.

c. <u>Biosafety Level 1 (BSL 1)</u>
Biosafety Level 1 is suitable for work involving well-characterized agents not known to consistently cause disease in immunocompetent adult humans, and present minimal potential hazard to laboratory

personnel and the environment. BSL-1 laboratories are not necessarily separated from the general traffic patterns in the building. Work is typically conducted on open bench tops using standard microbiological practices. Special containment equipment or facility design is not required, but may be used as determined by appropriate risk assessment. Laboratory personnel must have specific training in the procedures conducted in the laboratory and must be supervised by a scientist with training in microbiology or a related science.

d. Biosafety Level 2 (BSL 2)
Biosafety Level 2 builds upon BSL-1. BSL-2 is suitable for work involving agents that pose moderate hazards to personnel and the environment. It differs from BSL-1 in that:
    i. laboratory personnel have specific training in handling pathogenic agents and are supervised by scientists competent in handling infectious agents and associated procedures;
    ii. access to the laboratory is restricted when work is being conducted; and
    iii. all procedures in which infectious aerosols or splashes may be created are conducted in Biological Safety Cabinets (BSCs) or other physical containment equipment.

e. Biosafety Level 3 (not supported in STEM)
Biosafety Level 3 practices, safety equipment, and facility design and construction are applicable to clinical, diagnostic, teaching, research, or production facilities in which work is done with indigenous or exotic agents with a potential for respiratory transmission, and which may cause serious and potentially lethal infection. Primary hazards to personnel working with these agents relate to autoinoculation, ingestion, and exposure to infectious aerosols. At BSL-3, more emphasis is placed on primary and secondary barriers to protect personnel in contiguous areas, the community, and the environment from exposure to potentially infectious aerosols.

f. Biosafety Level 4 (not supported in STEM)
Biosafety Level 4 practices, safety equipment, and facility design and construction are applicable for work with dangerous and exotic agents that pose a high individual risk of life-threatening disease, which may be transmitted via the aerosol route and for which there is no available

vaccine or therapy. The primary hazards to personnel working with BSL-4 agents are respiratory exposure to infectious aerosols, mucous membrane or broken skin exposure to infectious droplets, and autoinoculation. All manipulations of potentially infectious diagnostic materials, isolates, and naturally or experimentally infected animals, pose a high risk of exposure and infection to laboratory personnel, the community, and the environment.

8. Biological Safety Cabinet Inspections

   a. Biological Safety Cabinets are isolation mechanisms for limiting the spread and exposure of biological materials.
   b. They are to be cleaned and disinfected on a regular basis, and their germicidal UV lights replaced at least once per year with regular use.
   c. Biological Safety Cabinets are inspected by an outside vendor and certified safe for use each year. BSCs which have not been inspected and certified within a year should not be used until they are deemed safe.
   d. The STEM Safety Officer will conduct periodic checks of BSCs on an informal basis.

9. Laboratory Equipment Safety

   a. Make sure you have been properly trained to use any equipment you require in your work. Do not use equipment unless you understand the proper procedures and safety protocols.
   b. Inspect any equipment or lab apparatus for damage before use. Never use damaged equipment such as cracked glassware or equipment with frayed or worn electrical wiring.
   c. Shield or wrap Dewar flasks and other evacuated glassware to contain chemicals and glass fragments should explosion occur.
   d. Select appropriate equipment based on an evaluation of relevant procedural hazards.
   e. PPE – Personal Protective Equipment:
      i. Inspect all personal protective equipment (lab coat, gloves, goggles) before use for damage. Do not use damaged PPE.
      ii. Lab coats should be worn at all times when working with materials in a laboratory. In addition, gloves should be worn when working with biological materials, and face shields or other shielding should be used when potential for splashes or other possible contamination hazards exist.

f. Centrifuges:
    i. 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.
    ii. Do not run without a balanced load and move well away from the machine while it is in motion. Use balances to regulate the weight in opposing buckets.
    iii. Be sure to wipe up any spills immediately to avoid spread, solidification and/or corrosion of the machine/containers.
    iv. Any corrosive, hazardous, or biological materials should only be centrifuged when appropriate secondary containment systems are in place.
    v. Make sure to clean up any spills and report any breakages and possible damage to the machine.

g. Other equipment:
    i. There are user manuals for most of the equipment found in STEM. Contact your supervisor or the Research Facilities Manager for a copy, and get properly trained in any equipment you need to use.

10. Bloodborne Pathogen Exposure Control applicability

Pertaining to Human Blood, Blood Products, Tissues, Cell Lines and Body Fluids

i. Any biological materials which are from human sources should be treated as potential carriers of human pathogens such as HIV and HBV.

ii. See Appendix 3D (Sec. 8, in pink) for the complete policy in the *Bloodborne Pathogen Exposure Control Plan.*

11. Recombinant DNA

1. Research which uses recombinant DNA technology involving any human genes or genes of potential human pathogens is overseen by the National Institutes of Health (NIH).
2. If such research is to be done in STEM, the Principal Investigator must submit a research proposal for approval from the Institutional Biosafety Committee and from NIH. See the Research Facilities Manager for details.

12. Risk Groups and Select Agents: Viruses and Toxins

1. Following NIH Guidelines, agents which pose a risk to human, animal, or plant health must be contained and treated as hazardous (see NIH Guidelines: Classification of Human Etiologic Agents on the Basis of Hazard http://osp.od.nih.gov/sites/default/files/NIH_Guidelines.html). In our laboratories, possible human pathogens must be treated as follows:
2. Research with viruses and toxins which pose a possible threat to human health must be approved by the Institutional Biosafety Committee.
    a. Section II-A-1. Risk Groups
        i. Risk assessment is ultimately a subjective process. The investigator must make an initial risk assessment based on the Risk Group (RG) of an agent
    b. Agents are classified into four Risk Groups (RGs) according to their relative pathogenicity for healthy adult humans by the following criteria:
        i. Risk Group 1 (RG1) agents are not associated with disease in healthy adult humans.
        ii. Risk Group 2 (RG2) agents are associated with human disease which is rarely serious and for which preventive or therapeutic interventions are often available.
        iii. Risk Group 3 (RG3) agents are associated with serious or lethal human disease for which preventive or therapeutic interventions may be available.
        iv. Risk Group 4 (RG4) agents are likely to cause serious or lethal human disease for which preventive or therapeutic interventions are not usually available.
    c. Section II-A-2. Criteria for Risk Groups
        i. Classification of agents in NIH Appendix B, Classification of Human Etiologic Agents on the Basis of Hazard, is based on the potential effect of a biological agent on a healthy human adult and does not account for instances in which an individual may have increased susceptibility to such agents, e.g., preexisting diseases, medications, compromised immunity, pregnancy or breast feeding (which may increase exposure of infants to some agents).
        ii. Personnel may need periodic medical surveillance to ascertain fitness to perform certain activities; they may also need to be offered prophylactic vaccines and boosters (see NIH Section IV-B-1-f, Responsibilities of the Institution, General Information).

d. Section II-A-3. Comprehensive Risk Assessment

i. In deciding on the appropriate containment for an experiment, the first step is to assess the risk of the agent itself. Appendix B, Classification of Human Etiologic Agents on the Basis of Hazard, classifies agents into Risk Groups based on an assessment of their ability to cause disease in humans and the available treatments for such disease. Once the Risk Group of the agent is identified, this should be followed by a thorough consideration of how the agent is to be manipulated. Factors to be considered in determining the level of containment include agent factors such as: virulence, pathogenicity, infectious dose, environmental stability, route of spread, communicability, operations, quantity, availability of vaccine or treatment, and gene product effects such as toxicity, physiological activity, and allergenicity.

ii. Any strain that is known to be more hazardous than the parent (wild-type) strain should be considered for handling at a higher containment level. Certain attenuated strains or strains that have been demonstrated to have irreversibly lost known virulence factors may qualify for a reduction of the containment level compared to the Risk Group assigned to the parent strain (see Section V-B, Footnotes and References of Sections I-IV).

13. Packaging, Shipping, and Receiving of Biological Materials

a. Individuals charged with shipping materials MUST be properly trained in procedures for safe transport. See the Safety Officer for additional information and training.

b. All shipment of biological materials should be checked for adherence to domestic or international shipping regulations as follows:

i. Appendix 3C outlines the specific procedures followed by the Centers for Disease Control and Prevention which adhere to DOT and IATA standards.

ii. If shipping domestically, follow Department of Transportation regulations for packaging and handling of biological materials. See Appendix 3C for details or go to http://www.cdc.gov/laboratory/specimen-submission/shipping-packing.html .

iii. If shipping internationally, the IATA (International Air Traffic Association) has a list of regulations which should be followed. See Appendix 3C for details or go to https://www.iata.org/whatwedo/cargo/dgr/Documents/DGR52_InfectiousSubstances%28DGR362%29.pdf

c. The following biological materials are regulated by the DOT and IATA for shipping:
    i. Infectious Substances: An infectious substance is defined as a substance which is known or reasonably expected to contain pathogens; pathogens are defined as microorganisms and other agents such as prions, which can cause disease in humans or animals.
        1. Infectious substances are divided into two categories:
            a. Category A infectious substances include:
                i. An infectious substance which is transported in a form that, when exposure to the material occurs, is capable of causing permanent disability, life-threatening or fatal disease in otherwise healthy humans or animals.
                ii. A diagnostic specimen that is suspected of containing a Category A Infectious Substance.
                iii. A patient specimen that is suspected of containing a Category A Infectious Substance.
            b. Category B infectious substances:
                i. Category B infectious substances are those infectious substances which do not meet the criteria for inclusion in Category A
                ii. Patient specimens suspected of containing a Category B Infectious Substance.

c. Since the STEM building does not support research above a BioSafety Level 2, shipments from our building will not be Category A substances.

d. **Genetically Modified Organisms:**

Genetically modified organisms and micro-organisms (organisms and micro-organisms in which genetic material has been purposely altered through genetic engineering in a way that does not occur naturally) which are capable of altering animals, plants or microbiological substances in a way which is not normally the result of natural reproduction. GMO regulations are in flux and guidance should be sought for shipping from the shipping company.

e. **Dry Ice**:

The shipment of ANY biological materials on dry ice is regulated as dry ice shipments. See Appendix 3B for details on shipping with dry ice.

f. **Unregulated Substances:**

The following biological materials ARE NOT regulated for shipping unless they are packaged with another material that is regulated (e.g., dry ice):

i. Patient specimens for which there is a minimal likelihood that pathogens are present:

ii. Patient specimens are defined as those collected directly from humans or animals, including, but not limited to, excreta, secreta, blood and its components, tissue and tissue fluid swabs, and body parts being transported for purposes such as research, diagnosis, investigational activities, disease treatment and prevention.

iii. In determining whether a patient specimen has a minimal likelihood that pathogens are present, an element of professional judgment is required to determine if a substance is exempt. That judgment should be based on the known medical history, symptoms and individual circumstances of the source, human or animal, and endemic local conditions.

iv. Examples of specimens that can be transported as patient specimens:

   a. Blood or urine tests to monitor cholesterol levels, blood glucose levels, hormone levels, or prostate specific antigens;
   b. Tests required to monitor organ function such as heart, liver or kidney function for humans or animals with non-infectious diseases, or therapeutic drug monitoring;
   c. Tests conducted for insurance or employment purposes and are intended to determine the presence of drugs or alcohol;
   d. Pregnancy tests;
   e. Biopsies to detect cancer;
   f. Antibody detection.

v. Please note: Packages of patient specimens must be labeled with one of the following: "Exempt human specimens" or "Exempt animal specimens."

vi. Substances that do not contain infectious substances or substances which are unlikely to cause disease in humans or animals.

vii. Substances in a form that any present pathogens have been neutralized or inactivated such that they no longer pose a health risk.

viii. Substances containing microorganisms which are non-pathogenic to humans or animals.
ix. Dried blood spots collected by applying a drop of blood onto absorbent material, or fecal occult blood screening tests and blood or blood components, which have been collected for the purposes of transfusion.
x. Tissues or organs intended for transplantation.
xi. Environmental samples (including food and water samples), which are not considered to pose a significant risk of infection.

14. References & Resources

NIH Biosafety Guidelines: http://osp.od.nih.gov/office-biotechnology-activities/biosafety/nih-guidelines

NIH Guidelines for Research Involving Recombinant or Synthetic Nucleic Acid Molecules http://osp.od.nih.gov/sites/default/files/NIH_Guidelines.html

IATA Regulations:
https://www.iata.org/whatwedo/cargo/dgr/Documents/DGR52_InfectiousSubstances%28DGR362%29.pdf

CDC Links for shipping regulations:
http://www.cdc.gov/laboratory/specimen-submission/shipping-packing.html

CDC Diagnostic Specimen Shipping Requirements:
http://www.cdc.gov/nceh/vsp/cruiselines/OPRP/docs_word/diagnostic_specimen_shipping_detailed.doc

Michigan State EHS Shipping Regulations:
http://www.ehs.msu.edu/biological/programs_guidelines/shipping/regulated_biological_materials.htm

15. Section 3 Appendices

Appendix 3A: Detailed Regulations for Shipping Biological Specimens

Appendix 3B: Regulations regarding shipping with Dry Ice

Appendix 3C: Biosafety Level Controls & Requirements

Appendix 3D: NJCSTM Policy: Bloodborne Pathogen Exposure Control (See Section 8)

Appendix 4A: Detailed Regulations for Shipping Biological Specimens

Individuals charged with shipping biological materials MUST be properly trained in procedures for safe transport. See the Safety Officer for additional information and training.

See http://www.cdc.gov/laboratory/specimen-submission/shipping-packing.html

Appendix 4B: Regulations regarding shipping with Dry Ice

Individuals charged with shipping materials using dry ice MUST be properly trained in procedures for safe transport. See the Safety Officer for additional information and training.

1. USPS http://pe.usps.com/text/pub52/pub52apxc_028.htm
2. UPS http://www.ups.com/content/us/en/resources/ship/materials/coolants.html
3. FedEx http://images.fedex.com/us/services/pdf/Dry_Ice_Job_Aid.pdf

Appendix 4C: Biosafety Level Controls & Requirements

Appendix 4D: NJCSTM Policy on Bloodborne Pathogen Exposure Control, see Sec 8

Section 5: Fire Safety Policies & Procedures

1. Introduction and Purpose
2. Safe Handling of Flammable Chemicals
3. Defining Flammable and Combustible Liquids
4. Classes of Fires
5. Fire Extinguishers
6. Fire Drills, Sprinklers
7. Site-specific Fire Plan
8. References

1. Introduction and Purpose

Fire safety is an important aspect of laboratory safety. Knowing how to deal with flammable chemicals and what to do in a fire emergency can save your life.

2. Safe Handling of Flammable Chemicals

In general, the flammability of a chemical is determined by its flash point, the lowest temperature at which an ignition source can cause the chemical to ignite momentarily under certain controlled conditions.

i. Chemicals with a flash point below 100° F (37.8° C) will be considered a "Fire Hazard Chemical".
ii. Think before you make a move when handling flammable liquids.
iii. Quantities of one gallon (four liters) or more of flammable liquids must be stored in approved safety containers.
iv. Small quantities of flammables may be stored on open shelves. Bulk quantities must be stored in an approved flammable safety cabinet or flammables storage room. Do not store flammables in fume hoods.
v. Do not store ether or any other flammable in refrigerators, unless the refrigerator is rated as explosion proof. (Such refrigerators will be clearly marked "Flammable".)
vi. Flammable liquids should always be kept away from sources of ignition: heat, fire, reactive chemicals and sparks. Ground any metal drums or transfer vessels.
vii. Flammables should be stored separately from oxidizers and out of direct sunlight in tightly closed containers.
viii. Avoid heating flammable solvents with open flame.
ix. Maintain adequate ventilation.
x. Use properly labeled safety cans and cabinets.
xi. Maintain and know how to use ABC fire extinguishers.
xii. Minimize quantities of flammable chemicals in work area.

xiii. Flammable liquids must never be dumped in a sink. Dispose of flammables as chemical waste in approved, properly labeled containers in accordance with the STEM Hazardous Waste Policy.

3. Defining Flammable & Combustible Liquids

a. Flammable Liquids

Defined as liquids having closed cup flash points below 100°F (37°C) and vapor pressures not exceeding 40 psi (276 kPa) (2.76 bar) at 100°F (37°C). Flammable liquids are referred to as Class 1 liquids.

i. Class IA liquids - flash points below 73°F (22.8°C) and boiling points below 100°F (37.8°C).
ii. Class IB liquids - flash points below 73°F (22.8°C) and boiling points at or above 100°F (37.8°C).
iii. Class IC liquids - flash points at or above 73°F (22.8°C) and below 100°F (37.8°C).

b. Combustible Liquids

Defined as liquids having closed cup flash points at or above 100°F (37°C). Combustible liquids are referred to as Class II or Class III liquids.

i. Class II liquids - flash points at or above 100°F (37.8°C) and below 140°F (60°C).
ii. Class IIIA liquids - flash points at or above 140°F (60°C) and below 200°F (93.4°C).
iii. Class IIIB liquids - flash points at or above 200°F (93.4°C).

4. Classes of Fires

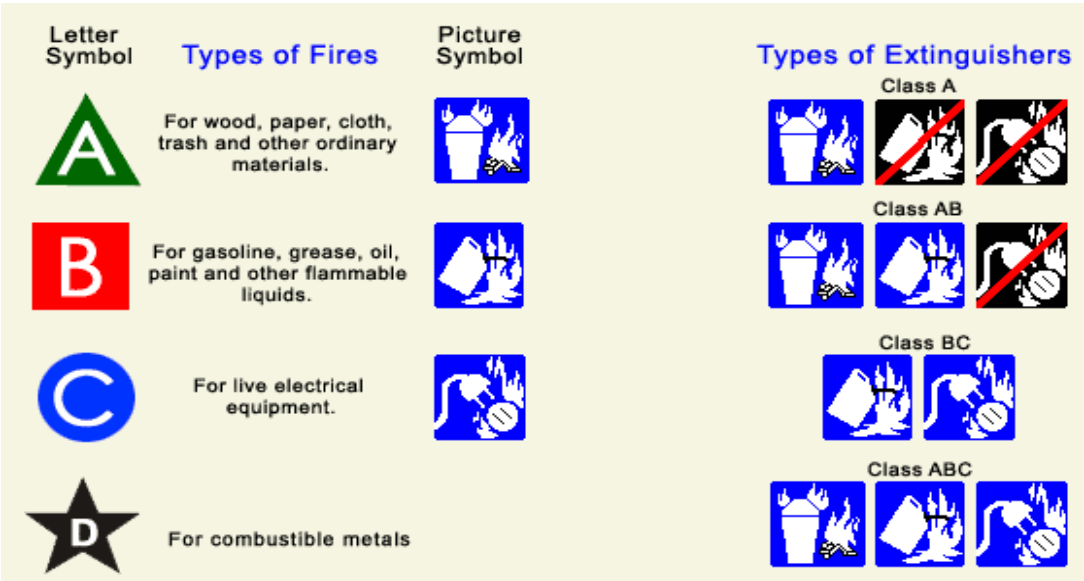
In the USA, fires are classified into five groups: A, B, C, D, and K

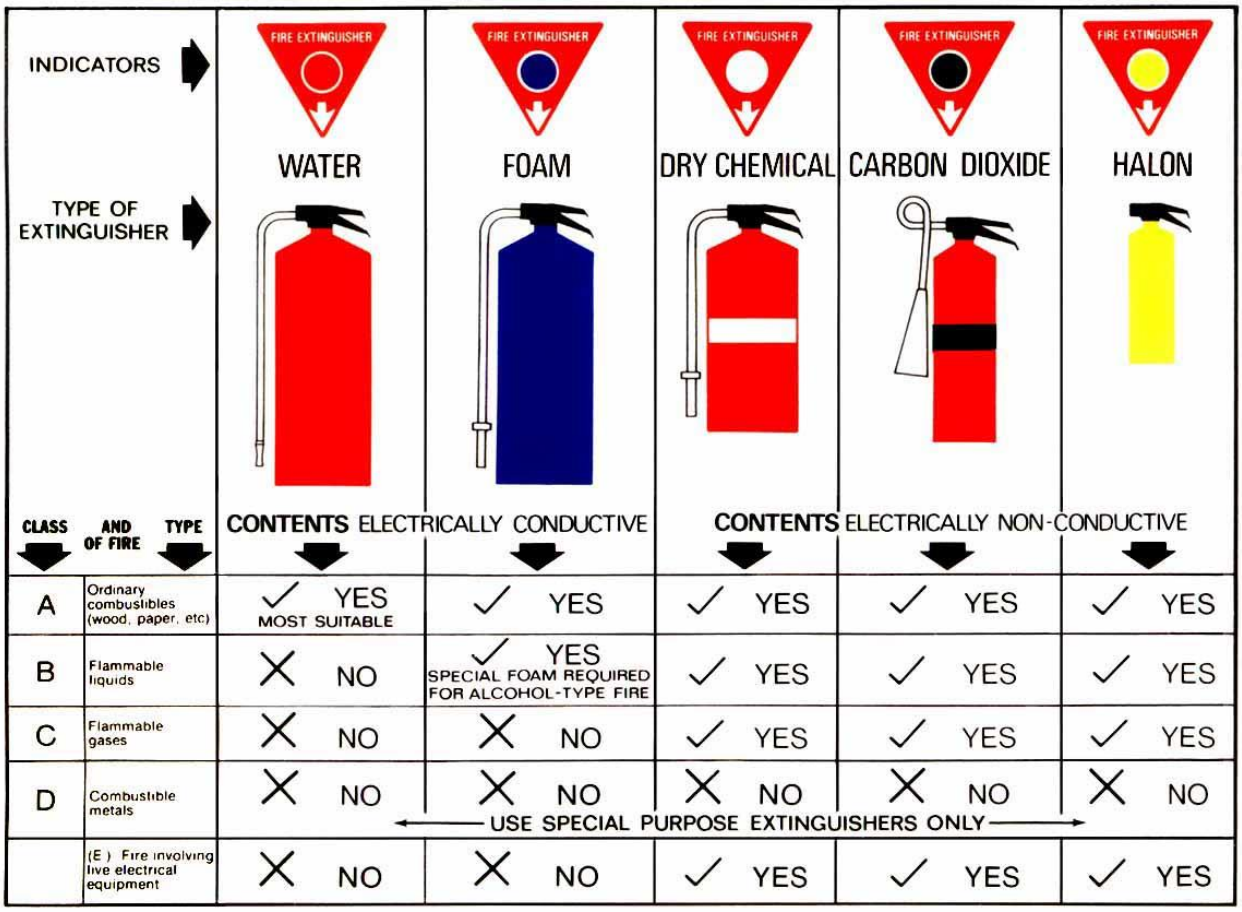
xiv. Class A fires involve organic solids like paper, wood, etc
xv. Class B fires involve flammable Liquids or Gases.
xvi. Class C fires are electrical fires
xvii. Class D fires involve Metals
xviii. Class K fires involve cooking oils or waxes with high flashpoints

5. Types of Fire Extinguishers:

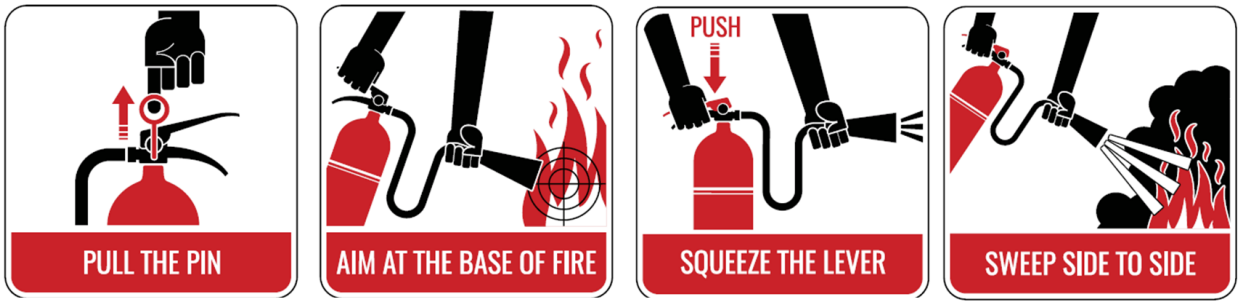
Individuals should be trained in the use of fire extinguishers before attempting to use one in an emergency; choosing the wrong type of extinguisher on the wrong type of fire can increase the chance of spread and injury. If you don't know how to choose and use extinguishers wisely, better to let the professionals handle it. CALL 911!

a. **Class A extinguishers are for ordinary combustible materials** such as paper, wood, cardboard, and most plastics. The numerical rating on these types of extinguishers indicates the amount of water it holds and the amount of fire it can extinguish. Geometric symbol (green triangle)
b. **Class B fires involve flammable or combustible liquids such as gasoline, kerosene, grease and oil.** The numerical rating for class B extinguishers indicates the approximate number of square feet of fire it can extinguish. Geometric symbol (red square)
c. **Class C fires involve electrical equipment,** such as appliances, wiring, circuit breakers and outlets. Never use water to extinguish class C fires - the risk of electrical shock is far too great! Class C extinguishers do not have a numerical rating. The C classification means the extinguishing agent is non-conductive. Geometric symbol (blue circle)
d. **Class D fire extinguishers are commonly found in a chemical laboratory.** They are for fires that involve combustible metals, such as magnesium, titanium, potassium and sodium. These types of extinguishers also have no numerical rating, nor are they given a multi-purpose rating - they are designed for class D fires only. Geometric symbol (yellow decagon or black star)
e. Class K fire extinguishers are for fires that involve cooking oils, trans-fats, or fats in cooking appliances and are typically found in restaurant and cafeteria kitchens. Geometric symbol (black hexagon)





Use of fire extinguishers: PASS – Pull-Aim-Squeeze-Sweep



6. References & Resources
OSHA Flammability info:
https://www.osha.gov/dte/library/flammable_liquids/flammable_liquids.html

7. Fire Plan – Fire & Safety Policies & Procedures

Emergency Action Plan

General Fire Safety Policies, Procedures, and Instructions for STEM;
adapted from Kean University Health and Safety Plan

Procedures for workplace safety

Introduction

To comply with our Fire Safety Policy and Emergency Action Plan the following procedures apply to all faculty, staff, students, contractors and tenants.

Scope and Application

PEOSH requires emergency action planning in all workplace settings. Each department is responsible for the development and implementation of a written Emergency Action Plan (EAP) covering the facilities and operations under their control.

Procedural Description

Potential emergency situations within a building may require the occupants to evacuate the building. The following information and procedures have been designed to help ensure your personal safety, should a building evacuation become necessary.

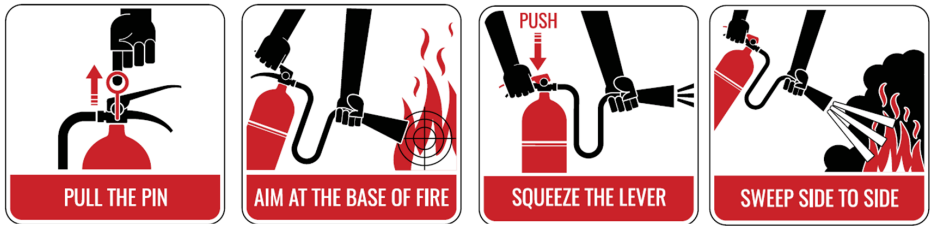
Before a Fire Emergency – Planning

a. Keep your most important personal belongings readily accessible, especially keys to your home and vehicle, pocketbook, wallet, medications and appropriate clothing for outside assembly. You may not be able to return to the building for an extended period!
b. Take time to get to know the building. Know the location of at least two of the nearest available exits from your area.
c. Do not use elevators in case of emergency - they may not work!
d. Know the location of the nearest available fire alarm pull stations in the building where you are located and how to activate them. Fire alarm pull stations have self-inscribed instructions.
e. Participate in fire drills and take them seriously.
f. Fire Extinguishers; based on this emergency action plan; only certain designated employees are certified/trained to use a fire extinguisher. All other occupants of the building must evacuate!

g. Note: building occupants are not required to fight fires.
h. Be aware of persons in your area who would have difficulty evacuating due to physical limitations during an evacuation.
i. Be aware of any rooms or offices where an alarm may not be heard, including, but not limited to some bathrooms and photographic darkrooms.
j. Accountability; All supervisors shall be responsible an attendance roster listing all students, employees and lab occupants and to make sure everyone has evacuated when the Fire Alarm sounds.

On Discovering - Reporting a Fire

a. Preferred method of notifying occupants of a fire: If you observe fire or smoke activate the building's fire alarm pull station. Fire alarm pull stations have self-inscribed instructions.
b. Time permitting, recover your most important personal belongings that are readily accessible, especially keys to your home and vehicle, pocketbook, wallet, medications and appropriate clothing for outside assembly. You may not be able to return to the building!
c. If smoke is present, crawl low to the floor.
d. Go to the nearest available exit and leave the building. Use the nearest available stairways; never use elevators!
e. Preferred method of reporting fire to emergency response personnel: Call University police (ext 911 from a University phone or 908-737-4800) and provide your location and a description of the fire after you have left the building.
f. <u>Extinguisher Use-</u>
   If the fire is incipient-(size of a wastebasket) and you have taken the provided annual fire extinguisher training, use your safety first--discretion to select the proper type of fire extinguisher. Always keep an exit at your back. Attempt to extinguish the fire only after evacuation has started and the University Police have been called. Building occupants are not required to fight fires. Your safe evacuation should come first and foremost. As such all occupants are required to evacuate when the fire alarm sounds!



On Hearing the Fire Alarm - Evacuating the building

a. All occupants of the building must immediately evacuate the building by proceeding to the nearest available safe exit and proceed to the designated Assembly Area (at the sidewalk split on the Morris Ave side of STEM).
b. Time permitting; recover your most important personal belongings that are readily accessible, especially keys to your home and vehicle, pocketbook, wallet, medications and appropriate clothing for outside assembly. You may not be able to return to the building!
c. When you leave the room, close the door.
d. If smoke is present, crawl low to the floor.
e. Alert all persons in your area as you are exiting the building.
f. Description of Audible Alarm: The alert tone throughout campus at this time is one of three types of alarms. The newest is a voice/alarm, the second and most common is a horn/strobe alarm and a few buildings still maintain a bell alarm. STEM fire alarms are strobe lights with verbal directions to leave.
g. In the STEM building, the air handlers will create a positive pressure in the stairwells to retard fire entry – be warned that this is loud and causes vibration in the stairwell. This is normal; proceed with evacuation as outlined.

If You Are Not Able to Leave - shelter in place

Feel the doorknob, with the back of your hand, before opening any door. IF IT IS HOT, DO NOT OPEN THE DOOR. If it is not hot, brace yourself behind the door and open it slightly. If heat or heavy smoke is present, close the door and stay in your room. KEEP LOW TO THE FLOOR.

a. If you cannot leave the room, seal the cracks around the door with wet towels or other materials. Call University police 908-737-4800 (extension 911 from a campus phone) and let them know your location and that you are unable to exit.
b. Close all doors and windows in the vicinity of the fire.
c. Stay close to the window, holding a wet towel to your face; and alert rescue personnel by hanging a white sheet or cloth in the window.

Exiting - Evacuating the building

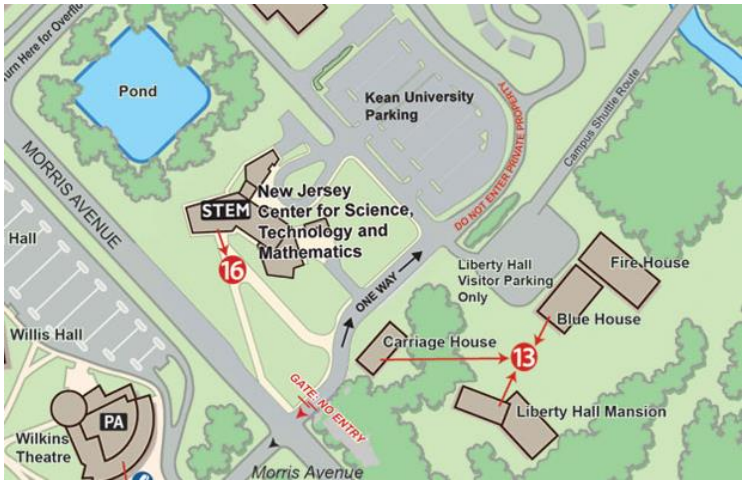
a. Leave the building using the nearest available exit.
b. Do not use the elevator! It may not work in a fire emergency!
c. When using the stairwell to evacuate, stay close to the wall to allow Emergency Personnel sufficient access to the location of the emergency.

If an exit is blocked by fire or smoke, go to another available exit.

a. If all exits are blocked, return to a safe location, close the door and call University police (extension 911 from a campus phone or 908-737-4800) to report your location. 911 from a cell phone will be directed to KUPD.

b. After leaving, move away from the building. Do not stand in the roadway! Stay a minimum of 150 feet from the building and meet at the designated assembly area - which is the walkway between Morris Avenue and the STEM building towards the south.

c. See Evacuation Assembly Area Map for your location: https://www.kean.edu/media/evacuation-map



d. Campus police will advise if relocation is needed.

e. Re-entry: Do not re-enter the building until instructed by either the University Police or fire department officials with authority from the Incident Commander. Often the emergency response personnel silence the alarm prior to completion. ***A silenced alarm does not mean re-enter.*** Occupants will be notified to re-enter upon the fire and/or police department mobile public address system.

Fire Evacuations: Occupants with Disabilities

a. It is required that University Police know of any individual's immobility, whether temporary or permanent. The Fire Safety Director maintains a list of immobile faculty, staff and students. Self identification is voluntary and confidential. The campus police dispatcher should receive an updated list each year of all the occupants with disabilities and the designated areas of refuge. Personnel included on the list are met in person by the Fire Safety Director and given individual guidelines to follow along with a list of all buildings and areas of refuge within each building. Awareness of occupants with a disability is the key to assisting during an emergency.

b. Prior to an emergency evacuation of any kind, a partner should be assigned or chosen to accompany and remain with the disabled occupant. Attempting to carry an immobilized person is discouraged.

c. If a fire alarm is activated, the following procedures should be followed at all times:
    i. The disabled occupant or guardian assigned to the disabled occupant should call extension 911 to notify University Police of their location. If a phone is not readily available, the disabled occupant or guardian assigned to the disabled occupant should ask a messenger to communicate their location to the University Police or The Township of Union/Hillside Fire Department.
    ii. Visually impaired but mobile persons should first be moved out of the rush of traffic and then promptly assisted to the nearest exit.
    iii. Hearing impaired but mobile persons, who may be unaware of the need to evacuate, should be calmly advised and guided to the nearest available exit.
    iv. Temporarily immobilized persons, including people wearing casts and/or using canes or crutches, should be assisted, depending on their ability to go up and down stairs and maneuver through doorways. Proceed into the stairwell and wait on the landing until additional help can be summoned.
    v. Permanently immobilized persons who have either limited or no use of their legs and must rely on crutches, wheelchairs or walkers for transport should proceed into the nearest available safe stairwell and wait on the landing until additional help can be summoned.
    vi. Most enclosed staircase landings in each building are listed as an Area Of Refuge. STEM landings behind the fire doors are AOR.
    ii. In the event that an individual is unable to exit into the staircase landing, whether because of a physical impairment or due to a fire condition in the hallway, that person is to remain in his or her room and/or office and notify University Police at (908-737-4800). See shelter in place guidelines listed above.

d. The University Police and/or the local fire department will arrive to help complete the evacuation.

(End of emergency action plan) continuation of general fire safety policy

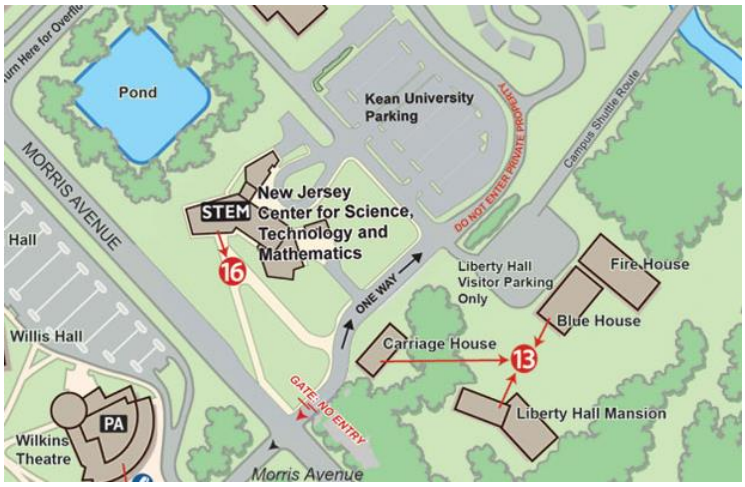
6. Fire Safety Equipment & Drills

1. The safety of the Kean University community is everyone's responsibility, and equipment and facilities are maintained to enhance safety. Accordingly, Kean University has a "Zero Tolerance" policy regarding tampering with fire safety equipment. Deliberately causing a fire alarm, falsely reporting a fire or a bomb threat, setting a fire, possessing highly combustible materials, vandalizing any fire system or misusing/blocking any piece of fire equipment (fire extinguisher, pull stations, pull station cover boxes, bells, smoke detectors and sprinklers) are all acts that will be referred to a University hearing officer for adjudication. Violations of this nature may result in severe disciplinary action. Faculty, staff or students having any information regarding a false alarm or fire should report the facts to University Police immediately. Violators will be prosecuted to the full extent of the law.

2. The following link provides excellent information on fire. United States Fire Administration-Fire Safety Information: http://www.usfa.fema.gov/citizens

3. **Fire Drills –Campus Wide**
   Fire evacuation drills for all campus buildings are scheduled on an annual basis with the start of the fall semester each year. This annual event provides "hands on" training for our campus community on the proper procedures during an emergency evacuation of a building. The drills are designed to train our faculty and staff and evaluate their efficiency and effectiveness in carrying out emergency evacuation procedures. Occupants are reminded not to use the building's elevators, as they may not function in a fire condition. Campus Police are located inside and outside to assist with guiding building occupants to their designated area of assembly. Campus Police receive annual training on the safe and orderly emergency evacuation of personnel.

   Fire drill gathering area for STEM is area 16- toward Morris Avenue, as pictured:



4. Fire Alarm Inspection and Testing

a. Inspection and testing of all fire detection and suppression systems is performed by independent companies to ensure compliance with all applicable codes and standards. In accordance with state law, every fire alarm system throughout each building is tested / inspected once a year by our authorized fire system maintenance contractor to make sure the systems are working properly.
b. The Fire Safety Director is responsible to schedule the inspection and testing of all fire alarm systems including smoke detectors, sprinkler systems and fire extinguishers. The testing and inspections are scheduled during the summer months, with notices sent to key building occupants.
c. The key building personnel are responsible for notifying the building occupants of the date and time of the test. The independent fire alarm contractor is also responsible to keep the building occupants informed as to when testing is occurring, how emergency notification will be provided during testing and confirmation upon completion of the testing. The fire alarms systems throughout our campus are monitored 24 hours a day at the Kean Police Headquarters.
d. Sprinkler systems are tested quarterly and inspected monthly. All of the Residence Halls are provided with a complete sprinkler system. Some of our academic buildings have sprinkler systems as well.

5. Kean University's fire safety program is under the jurisdiction of the Department of Community Affairs, Division of Fire Safety. Under the authority invested in the Division of Fire Safety by 35 the Uniform Fire Code, this state agency inspects all campus facilities. Some buildings are inspected quarterly depending on their classification and use. Kean University's Fire Safety Director periodically inspects the buildings throughout the year to insure compliance with all State codes.

6. Fire extinguishers

i. Portable fire extinguishers can save lives and property by putting out or containing small (incipient) fires until the fire department arrives; but portable extinguishers have limitations.
ii. Because a fire can grow and spread so rapidly, the number one priority for residents is to evacuate out of the building using the nearest safe exit.
iii. Note: Policy reminder: All employees/students and faculty are required to evacuate the building upon fire alarm activation.

7. The only persons authorized (at their-safety-first discretion) to attempt to extinguish an incipient fire (size of a wastebasket) are facilities employees and campus police/security personnel who have received our university-provided annual fire extinguisher training.

8. There are approximately 800 fire extinguishers on campus. All fire extinguishers are inspected monthly, and hydrostatically tested in accordance with National Fire Protection Association - N.F.P.A.10. If anyone sees a fire extinguisher with an old inspection tag or an extinguisher that is damaged or missing, please report the location to the Fire Safety Director at extension 75010. Tampering with a fire extinguisher is a violation of the law and violators will be prosecuted to the fullest extent of the law.

9. **Fire Extinguisher Safety Tips:**

a. Use a portable fire extinguisher, if the fire is incipient-(size of a wastebasket) *and* if you are authorized by having taken the university provided annual training-remember these useful tips: http://www.fireextinguisher.com

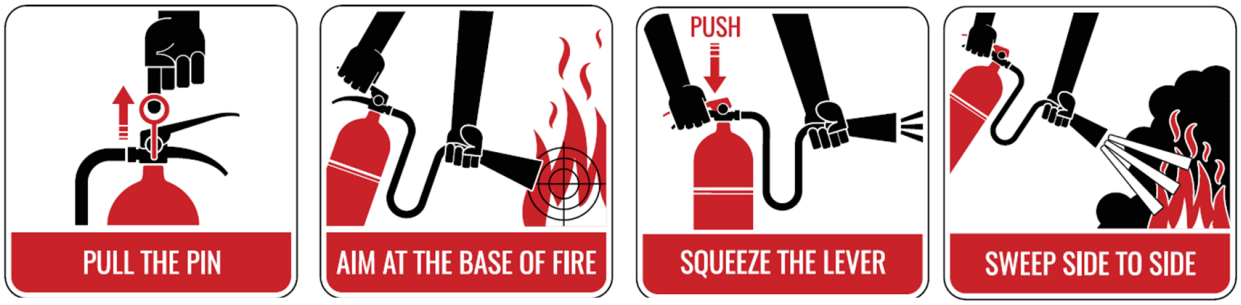
To operate a fire extinguisher, remember the word **PASS**:

i. -**P**ull the pin. Hold the extinguisher with the nozzle pointing away from you & release the locking pin.
ii. -**A**im low. Point the extinguisher at the base of the fire.
iii. -**S**queeze the lever slowly and evenly.
iv. -**S**weep the nozzle from side-to-side while aiming at the base of the fire.

b. Read the instructions that come with the fire extinguisher and become familiar with its parts and operation before a fire breaks out. The Fire Safety Director provides fire extinguisher training to certain designated employees based on Kean's Emergency Action Plan.

c. Most fire extinguishers are installed close to an exit. Keep your back to a clear exit when you use the fire extinguisher, so you can make an easy escape if the fire cannot be controlled. If the room begins to fill with smoke and fire, leave immediately.

d. Know when to go. Fire extinguishers are one element of a fire response plan, but the primary element is safe evacuation out of the building.



10. Sprinklers

a. A properly maintained and working sprinkler systems is an important part of the fire protection system within the STEM building. Like fire alarms, these systems are checked on a regular basis. Their purpose is to suppress a fire and keep it from spreading. Water flowing in the system triggers the fire alarm. Please report any leaking sprinkler equipment to the Fire Safety Director at extension 75010, Alonso Losada, the STEM building Manager at x75848, or University Police at extension 74800.

b. The sprinkler heads in the STEM building require that no object be within 18 inches of the ceiling in any room. This may prohibit materials from being stored on the top shelves of many labs, so measure for safety!

c. Do not hang any objects or decorations from sprinkler heads and pipes. This action can not only cause damage, but it is illegal if done intentionally.

7. <u>Fire Prevention – Regulations & Prohibited Activities</u>

The following items are prohibited to assist with fire prevention at the university. Please be advised that while this list is extensive, it is in no way all-inclusive. The list is intended to be used as a guideline.

a. The possession of candles, incense, or any open flame devices are not permitted in the building unless properly authorized by the Fire Safety Director. **This means you need to get a safety inspection for use of any Bunsen burners, so keep this in mind when setting up a work station.**
b. Live Christmas trees and wreaths, unless properly authorized by the Fire Safety Director.
c. Neon signs and string lights (e.g. holiday lights).
d. Firearms, weapons, paintball guns, fireworks, explosives, firecrackers and like items.
e. Unauthorized modification of space and the furnishings contained within, including the installation of air conditioners, refrigerators, paintings, and any personal furniture is prohibited.
f. Do not decorate common areas with hangings or other items
g. Nothing may be attached to any egress window or egress door
h. Disorderly room/office conditions and/or the storage of excessive amounts of paper, trash or recyclables are prohibited.

i. Trash and recycling containers must not interfere with the building's means of egress and cannot be stored in stairways.
j. Personal lamps including halogen lamps are not allowed.
k. Motor vehicles of any kind, including but not limited to, mopeds, motorcycles, and motor bikes are prohibited in the building.
l. **Electrical heat producing appliances** (stoves, George Foreman grills, toasters, toaster ovens, hot plates, and portable heating units) **are prohibited**, including all appliances that are not UL listed and appliances that are recalled by manufacturers or government agencies.
m. Open coil appliances for heating water and beverages are prohibited.
n. Electric heaters are only allowed if provided by the University.
o. Blocking the means of egress within hallways/walkways and staircases in any building is prohibited.
p. Door stops, wedges and other unapproved hold-open devices on fire doors shall be prohibited. Self-closing and automatic-closing devices shall be approved. Where it is desired to keep doors open, an automatic-closing device actuated by the fire detection system shall be provided in accordance with the building code. All unauthorized devices used to prop open doors shall be removed immediately.
q. Smoking is not permitted within any building on campus.
r. Possession of highly flammable materials including gasoline, their containers (whether containing fuel or empty), propane cylinders, etc.
s. Kerosene lamps, oil lamps, alcohol lamps, lighter fluid and other highly flammable substances.
t. Setting or fueling a fire of any size.
u. Use of fire-fueled or electric grills for any purpose is prohibited.
v. Portable LP gas cooking equipment such as a barbecue grill is restricted to the dining hall vendor via a permit process with the Division of Fire Safety.
w. A person shall not cause or allow open burning unless approved in accordance with the Uniform Fire Code and the KEAN Fire Safety Office.
x. A person shall not take or utilize an open flame or light in any structure or other place where highly flammable, combustible or explosive material is utilized or stored.
y. The installation of personal locks or chains, splicing cable lines, use of materials that damage the surfaces of the building interiors or prevents authorized equipment from working properly is prohibited.
z. Do not spray aerosol cans near smoke detectors.
aa. Power strips without an internal circuit breaker and UL approval are prohibited.

bb. Electrical cords shall not be routed unsafely (under carpets, in pathways, through doorways, taped down etc.).
cc. Underpowered extension cords and non-breaker multi-plug adapters are prohibited.
dd. Plug in air fresheners are prohibited.
ee. Power strips may not be used in series to gain greater length.
ff. Spliced, taped or frayed cords must not be used.
gg. Do not hang or attach anything to, or on, any lamp, light fixture, sprinkler head or any other fire detection or suppression devices.
hh. Anything that damages, misuses, or otherwise interferes with the ready and proper operation of any fire detection or fire suppression equipment and related signs is forbidden. This includes, but is not limited to: sprinklers, heat and smoke detectors, extinguishers, fire alarm control panels, pull stations, annunciator, emergency lighting, exit signs, and emergency floor plan evacuation signs.
ii. Intentional activation of a fire alarm when there is no fire emergency is prohibited.
jj. Individual(s) responsible for causing false alarms will be fined $500.00 and will face both disciplinary and legal action.

Consumer Product Safety Commission
The following is an excellent link to review consumer products for possible recalls due to safety concerns that may occur with consumer products: http://www.cpsc.gov

Use of Places of Assembly

1. Arrangement of "set ups" in all multi-purpose rooms and all assembly occupancies must be made through the Office of Facilities and Campus Planning. The Kean University personnel assigned responsibility for "set ups" will review all "set up" plans with the Fire Safety Director to ensure compliance with the State of New Jersey, Uniform Fire Codes.
    ii. To ensure continued compliance with fire codes, re-arrangement of previously approved "set ups" is prohibited without the proper authorization of the Fire Safety Director or designate.
    iii. The individual requesting the "set up" is responsible for ensuring that the approved "set up" is not re-arranged. Re-arranging a "set-up" could in-advertently create a hazardous life safety situation.

iv. The occupancy load for all places of assembly must be followed without exception! Exceeding the occupancy load is cause for the function to be suspended until the legal occupancy load is achieved.

v. Under no circumstances are tables and chairs, other furniture or like objects allowed to be "set up" in hallways that are avenues to EXITS or part of the means of egress.

vi. Certain buildings on campus will require a "multi-use" permit from the New Jersey Division of Fire Safety. Please see the Fire Safety Director for a list of buildings/rooms.

Fire Lanes

The New Jersey Division of Fire Safety may require and designate public or private fire lanes as deemed necessary for the efficient and effective operation of fire apparatus. Fire lanes shall have a minimum width of 20 feet. Designated fire lanes shall be maintained free of obstructions and 39 vehicles and shall be identified in an approved manner. Parking in a fire lane/zone is strictly prohibited and violators will be prosecuted to the full extent of the law.

Fire Safety Education and Training-(campus wide)

At the beginning of each fall semester our campus community is provided literature on campus fire safety including emergency response protocol and procedures. In addition to fire safety information, "hands on" evacuation training is provided as well. This information is provided to all faculty, staff and students. Please keep informed.

Plans for future improvements in fire safety

The fire safety office is continually reviewing our campus facilities/buildings and educational/awareness programs to provide a " built in" fire safe environment in which the faculty, staff and students are prepared/ trained and able to react, evaluate and decide on the correct action should an emergency occur.

Uniform Fire Safety Act/Uniform Fire Code

NJCSTM is bound by the regulations set forth in the Uniform Fire Safety Act. A copy of the New Jersey Uniform Fire Code and the New Jersey International Fire Code is on file at the office of the Fire Safety Director located within the Kean University Maintenance building.

The Uniform Fire Safety Act also referred to as The Uniform Fire Code of the State of New Jersey (N.J.S.A. 52:27D-192 et seq.) was approved November 12, 1983. The ACT establishes a uniform, minimum fire safety code enacted by the Senate and General Assembly of the State of New Jersey.

Roles and Responsibilities

Department

a. Develop a written Emergency Action Plan which incorporates all the required elements.
b. Assign responsibility for the plan.
c. Train workers in the actions required of them under the plan.

Supervisors

a. Ensure workers are trained.
b. Follow plan in the event of an emergency.

EHS and Public Safety

a. Provide assistance in development and implementation of plan.
b. Periodically audit the plan.

Individual

a. Read and understand elements of plan.
b. Follow plan in the event of an emergency.

Key References and Resources

Kean University Fire and Environmental Health and Safety web site
www.kean.edu/ehs
General Fire Safety Policy for the Campus
http://www.kean.edu/admin/uploads/fire_evacuationupdate%202011.pdf
New Jersey Department of Community Affairs/Division of Fire Safety
http://www.nj.gov/dca/divisions/dfs/
United States Fire Administration
www.usfa.dhs.gov/citizens/index.shtm
http://www.fire-extinguisher101.com/sitemap.html

Section 6: Laboratory Start-up and Closeout – ILSE Laboratories

1. Introduction and Purpose
2. Instructions for Principal Investigators
3. Start Up procedures
4. Orientation and Safety Training
5. Laboratory Closeout information & procedures
6. Appendices
    - A. Laboratory Move-In Checklist
    - B. Decommissioning a Lab
    - C. Laboratory Decommissioning Move-Out List

1. Introduction & Purpose

To ensure a smooth startup and move into NJCSTM/ILSE Laboratories, it is important to keep open communications and for all parties to be aware of the policies of NJCSTM/ILSE and the needs of our Laboratories. Tenants will be expected to adhere to the contract and to the procedures outlined in this document.

2, Instructions for Principal Investigators

Moving In requires an overview of how space will be used and clarifying the responsibilities of the tenant laboratory and ILSE staff. Much of this will be covered by the contract, but some information may have to be communicated in real-time. It should be clear who will be responsible for maintaining various aspects of the lab, from procurements to use to disposal. If hazardous materials (chemical or biological) are to be used, it should be clear how it will be handled and who will be responsible for disposal. Please contact the Safety Officer with this information.

3. Laboratory Start-Up Procedures

The Principal Investigators of each lab are responsible for going over the Move-In Checklist of equipment and materials, with the Facilities Manager, at the beginning of the lease. This will provide written documentation of the state of the laboratory and its equipment, giving each party a starting point to work with in determining future needs and for future decommissioning procedures. If necessary, photographs will be taken to document initial states, especially if there is a question of damage or other issue.

4. Orientation & Safety Training

We request that employees be given an Orientation and Safety Training session from the STEM Safety Office. This session will orient them to the safety features of the building, as well as inform them how to deal with the hazards of laboratory chemicals

and biologicals in the STEM building. Please schedule this orientation within two weeks of opening the lab and when new employees come on-board. You can call the Safety Office at 908-737-7227 for scheduling.

5. Laboratory Closeout Policies
   a. Generally, we request *at least* 30 days' notice prior to moving out of our laboratories. This allows us time to set up decommissioning and decontamination procedures prior to move-out day.
   b. Unless otherwise noted in our lease contract, we expect the laboratory to be returned to its original state, with all equipment and space as it was prior to Move-In.
   c. The Move-In Checklist will be used to perform a final walkthrough of the lab and facilitate return of all equipment, keys, and IDs.
   d. See Procedure for Decommissioning a Laboratory document in Appendix B.

6. Appendices

Appendix 6A: Laboratory Move-In Checklist (ILSE)

Appendix 6B: Procedure for Decommissioning a Laboratory

Appendix 6C: Laboratory Decommissioning Move-Out Checklist

Appendix 6A: Laboratory Move-In Checklist

Company Name:_____

PI:_____ Co-PI: _____

Contact #:_____ Contact #:_____

ILSE Access ID cards issued to:

_____

_____

_____

_____

_____

Keys issued:

Room	# Keys	Issued to	Sign for receipt	Returned (date, initial)

Equipment Checklists:

Circle Y/N to note whether functioning correctly; add comments if needed

Safety Equipment:

Emergency shower access	Y	N_____
Eyewash station working correctly?	Y	N_____
Fire extinguisher charged?	Y	N_____
Chemical (fume) Hood (certified)?	Y	N_____
Biological Safety Cabinet (certified)?	Y	N_____
Flammable chemicals cabinet?	Y	N_____

Common Equipment access:

Autoclave (room 1-32) _____

Dishwasher (room 1-32) _____

Ice Machine (room 4-21 or 5-17) _____

-20C Freezer (room 1-32, room 5-04)_____

-80C Freezer (room 1-32, room 4-19)_____

Laboratory equipment:			Serial # or Comments:
MilliQ water tap _____	Y	N	_____
Refrigerator (type _____)	Y	N	_____
Freezer (type_____)	Y	N	_____
Incubator (type_____)	Y	N	_____
Oven (type _____)	Y	N	_____
Microwave (type _____)	Y	N	_____
Balance (type_____)	Y	N	_____
Balance (type_____)	Y	N	_____
Hot plate (type_____)	Y	N	_____
Microscope (type_____)	Y	N	_____
pH meter (type_____)	Y	N	_____
Rotating evaporator(type_____)	Y	N	_____
Shaker (type_____)	Y	N	_____
Stir plate (type_____)	Y	N	_____
Vacuum pump (type_____)	Y	N	_____
Vortexer (type_____)	Y	N	_____
Water bath (type_____)	Y	N	_____
Other (specify):			

Specialty Equipment: (Mass Spec, NMR, HPLC, LC, GC, etc.) by appointment or contract.

Appendix 6B Decommissioning of Laboratory Space Prior To Move-Out, Relocation, Demolition or Renovation

1. Purpose and Applicability

a. The purpose of these procedures is to eliminate, as much as possible, any potential hazards to personnel and the environment prior to the relocation, demolition or renovation of laboratory space.

b. These procedures were established to ensure that hazardous materials are disposed of properly when occupants of a laboratory transfer to a different laboratory or leave the Facility. Procedures also apply to all demolitions, renovations or reassignments of space conducted. These guidelines are based in part on information described in the American National Standard for Laboratory Decommissioning ANSI/AIHA Z9.11-2008.

c. This document is designed to reduce the number of unwanted and unknown hazardous materials in laboratories, reduce waste disposal costs, prevent or minimize the risk of exposure to personnel and provide personnel with a healthy, safe, and clean place to work. Responsibilities of the Principal Investigator, the Safety Office, and ILSE are addressed. Procedures that must be followed for the proper disposition of hazardous materials generated in research and included within building materials are identified.

d. These procedures shall be supplemented, expanded or consolidated as required to address the specific space and decommissioning effort.

2. Definitions

a. A laboratory is a place equipped for experimental studies in the sciences. It is a workplace where relatively small quantities of hazardous materials (chemical, biological, radiological, physical) are used on a non-production basis.

b. Hazardous materials are materials that can harm people, other living organisms, property, or the environment. Hazards include radioactive, flammable, explosive, toxic, corrosive, and biohazardous materials, and also oxidizers, asphyxiants, pathogens, allergens, pesticides and animals, that may have characteristics that render them hazardous in specific circumstances. Physical hazards include mechanical moving parts, high pressure reactions, lasers, magnetic fields, radiation, and microwaves.

c. Decommissioning is a process to ensure a facility meets environmental health and safety requirements for its next use.

d. Demolition/Renovation - Any operation which involves the wrecking, taking out, removal, stripping, or altering in any way or construction of one or more facility components or facility component insulation.

3. Roles and Responsibilities

a. The Principal Investigator is responsible for the proper use and disposal of all hazardous materials used for research purposes in the assigned laboratory space. When a PI or tenant leaves the STEM building, proper "clean out" procedures must be followed. See Appendix C for the Laboratory Decommissioning Move-Out Checklist.

The Safety Office will review check out procedures and provide information on hazardous materials, proper disposal procedures and regulations governing disposal of hazardous materials.

Any problems resulting from improper management (such as, but not limited to, unlabeled chemicals or biologicals, unknowns, outdated chemicals, chemicals which may have formed peroxides or have become shock sensitive) of hazardous materials at closeout will be addressed by the Safety Office and cleanup charges will be applied if necessary.

b. The Principal Investigator is responsible for ensuring that the hazardous materials used for research purposes and hazardous waste generated from the research procedures has been properly disposed of. *NJCSTM and/or ILSE will not be responsible for any additional cleanup costs, regulatory action or fines resulting from non-compliance with this policy*. In these instances, the responsible Principal Investigator will arrange for the necessary remediation funds.

c. The STEM Safety Officer shall inspect the facility before any demolition or renovation begins. The Safety Office shall provide technical guidance and advice to all parties regarding decontamination and waste disposal, ensuring compliance with state and federal regulations. The purpose of the Safety Office assessment is to identify, based on the historical use of the space, the types of contaminants anticipated and general areas and equipment that shall be professionally decontaminated.

d. The project manager is responsible for ensuring that this procedure has been followed. In addition, decontamination and proper disposal of hazardous materials that make up or are included within the building materials and equipment must be completed prior to any alterations of the space. This includes but is not limited to asbestos, lead paint, mercury, PCB's etc. Project managers shall give timely notification to NJCSTM or ILSE of planned renovations/demolitions of laboratory space.

4. Procedure for Decommissioning

a. Research materials, equipment and space – The Principal Investigator shall remove and properly dispose of all research materials from the laboratory and from any shared storage units such as refrigerators, stock rooms, hoods, and waste collection areas. Hazardous materials must be disposed of properly according to NJCSTM Safety Protocols. Lab occupants familiar with specific area hazards shall surface clean chemical hoods (unless heavily contaminated or a review determines a previous specialized use which needs specific testing and decontamination), biosafety cabinets, benchtops, cabinets, shelves etc. The Principal Investigator of the laboratory shall inspect the facilities and notify the Research Facilities Manager that graduate students, postdoctoral associates, and employees under his/her supervision have followed the proper disposal procedures and fulfilled his/her responsibilities for cleanup.

b. If laboratory equipment is to be discarded, the Research Facilities Manager shall be notified to assess equipment for hazardous materials. Batteries, capacitors, transformers, mercury switches, mercury thermometers, oil, asbestos linings, radioactive sources, and CFCs from refrigerators, etc. may be in equipment and must be removed before disposal. The Safety Office will clear this equipment for removal.

c. Decontamination of space

Standard decontamination procedures are:

i. Clean out all loose material and debris
ii. HEPA vacuum all surfaces
iii. Spray and wipe down all surfaces with an aggressive cleaner while wearing level B protection
iv. Collect all liquids from sink traps and chip tanks. Contact the Safety Office to test all sink traps and chip tanks for the presence of mercury. Plug all drains in any location where a sink trap or chip tank was removed. Safety will arrange Lock Out Tag Out for all water supplies to decommissioned sinks.
v. Call the Safety Office for proper assessment of abandoned containers uncovered during the demolition/renovation process.
vi. Ensure that the following items are collected and properly disposed of : fluorescent light tubes, light ballasts, batteries of any kind, mercury switches or controls, smoke detectors, electronic equipment and sharps.

The NJCSTM or ILSE Safety Office has Contract for Service information for vendors that are approved for laboratory decontamination procedures.

Specialized decontamination procedures may be necessary subject to review of historical use of space.

d. Removal of Chemical Fume Hoods, Ductwork and Fans

i. Evaluation of the historical use must be done
ii. Specialized chemical hood use (radioactive materials, perchloric acid, extremely hazardous compounds) requires further evaluation and testing
iii. All other chemical fume hoods require decontamination and cleaning of hood baffles and fans before removal and disposal.

e. Biological Safety cabinets (BSC) must be decontaminated by an authorized contractor before moving. BSCs must be recertified by an authorized contractor before reuse.

f. Building materials - Based on the historical use and type of operations conducted in the area, the contractor or tenant will arrange for dispose of building materials:

i. Asbestos abatement: Asbestos containing material (ACM) determine type, location and quantity of ACM
ii. Lead
iii. PCB materials
iv. Oil
v. Refrigerant
vi. Mercury

5. Key References

American National Standard for Laboratory Decommissioning ANSI/AIHA Z9.11-2008

U.S. Department of Labor, Occupational Safety and Health Administration, 29 CFR 1910.1450, Occupational Exposures to Hazardous Chemicals in Laboratories, January 31, 1990. http://www.osha.gov/pls/oshaweb/owadisp.show_document?p_table=STANDARDS&p_id=10106

University of Massachusetts/Amherst, Waste Management at UMass. http://www.ehs.umass.edu/Environmental%20Management.htm

University of Massachusetts/Amherst, Lab Decommissioning document http://www.ehs.umass.edu/sites/default/files/Laboratory%20Decommissioning%20_2011_0.pdf

US environmental Protection Agency: Protection of Environment, 40 CFR 239-299 http://www.epa.gov/epahome/cfr40.htm

6. Laboratory Decommissioning Checkout List – See Appendix 6C

Laboratory Decommissioning Checkout List

Company Name:_____ **STEM Room#**_____

Principal Investigator:_____
Name ***Email*** ***Phone***

All areas of the laboratory shall be inspected including refrigerators, acid and flammable storage cabinets, shelves, cabinets, drawers, walk in rooms, glove boxes, etc. "Cleaning" includes scrubbing with soap/cleaner and a final wipe-down with 70% ethanol or 10% bleach. *This checklist is to be completed during inspection by the PI and the STEM Safety Officer.*

RESEARCH MATERIALS: Circle appropriate response.

Chemical disposal or chemical relocation is complete. Y N N/A

Biohazardous materials have been collected and disposed of with appropriate disposal company: Y N N/A

The Safety Officer has scanned all materials for moving or disposal. Y N N/A

Materials in freezers, incubators, & refrigerators have been removed. Y N N/A

Hazardous waste disposal is complete. Y N N/A

Compressed gas cylinders have been returned to distributor. Y N N/A

EQUIPMENT: Circle appropriate response.

Biological Safety Cabinet(s) have been decontaminated. Y N N/A

Benchtops, cabinets, surfaces cleaned Y N N/A

Chemical Hood - surface cleaned Y N N/A

Refrigerator – surfaces cleaned Y N N/A

Incubators, shakers, etc. – surfaces cleaned Y N N/A

All STEM equipment returned clean and working. Y N N/A

PI:_____
Signature *Print Name* *Date*

Safety Officer:_____
Signature *Print Name* *Date*

STEM Mgmt: _____
Signature *Print Name* *Date*

NJCSTM Lab Safety Procedures Acknowledgement – Signature form

NJCSTM & KEAN UNIVERSITY

LABORATORY SAFETY PROCEDURES ACKNOWLEDGEMENT

I verify that I have carefully read and understand all of the safety rules, procedures, and guidelines of the NJCSTM Laboratory Safety Manual (LSM), provided to me as a hard copy or as a digital copy by email. A copy of the LSM can be found in each research laboratory in STEM.

I agree to read all materials and instructions for the conduct of specific experiments, procedures, and use of equipment in the laboratory provided by NJCSTM faculty, instructors, and research assistants. I recognize that it is my responsibility to abide by them for my own safety and for the safety of those I work with. *I understand that for the protection of everyone in the laboratory, students who do not follow the safety rules and guidelines outlined here may be asked to leave the laboratory and may be dropped from the course.*

I realize that many accidents are caused by negligence and I will behave in a manner that will ensure the health and safety of everyone in the laboratory at all times. This includes the wearing of proper clothing and covered footwear*. A lab coat and protective eyewear must be worn at all times while working in the laboratory. Food and beverages are not permitted in the laboratory at any time.*

I will only enter and use the lab facilities during assigned lab hours, and understand that I must be with a faculty member or staff member while in the laboratory. *I realize that for safety's sake no one should work alone in a laboratory.*

I understand that all chemicals are potentially dangerous, therefore I will exercise care in handling them, including the use of proper protective gear such as lab coats, gloves, and safety goggles or face shields, as directed by faculty or staff members. If I am unsure of the potential hazards of any chemical used, I will discuss this with my instructor(s) prior to using the chemical in question.

LABORATORY SAFETY PROCEDURES ACKNOWLEDGEMENT p.2

I understand that all bodily fluids are considered hazardous material, therefore I will exercise care in handling them, including the use of proper protective gear. If I injure myself while in the laboratory, I will notify my instructor immediately and take steps to protect my lab mates from exposure to blood or other bodily fluids.

I understand that I am required to wear safety glasses or goggles at all times while in the laboratory. I also understand that there are dangers involved in wearing all types of contact lenses in laboratory situations where reactive chemical agents, biological fixatives, or volatile organics are in use**. I am aware that even when safety goggles or glasses are worn, the wearing of contact lenses is discouraged in these situations**. *If I do elect to wear contact lenses in the laboratory, I will inform my instructor and I will assume all responsibility for damages caused by wearing them in the lab.*

If I have a medical condition, such as (but not limited to) hypoglycemia, hyperglycemia, diabetes, epilepsy, pregnancy, heart ailments, or any other medical condition which may cause sudden loss of consciousness, I certify that I am under a doctor's care and that my doctor has given me explicit permission to participate in this laboratory course. I understand that it is my responsibility to inform my instructor of my condition at the beginning of the term, or as soon as I am aware of the medical condition.

I understand that I am permitted to work in the laboratory ONLY WHEN UNDER THE SUPERVISION of a laboratory instructor, unless specifically informed otherwise.

I understand that by signing this form, I am agreeing to abide by the safety rules outlined here and in the Laboratory Safety Manual. I understand that these rules are designed to protect me, other students in the laboratory, and the faculty, staff, and research assistants in the STEM building. I understand that by signing this form I am *not* waiving my right to take legal action against the University. Signing this form indicates my agreement to obey the safety rules outlined above.

Signature	*Print name*	*Date*

Lab	*Instructor/Supervisor*	*Term*

This form must be signed and turned in to the Safety Officer prior to beginning work in the laboratories in NJCSTM.

Section 7: Important Phone Numbers & Contacts

IN AN EMERGENCY CALL 911 or Campus Police at x74800 (908-737-4800)

STEM Building address is 1075 Morris Avenue, Union, NJ –
Indicate what floor and room in which the emergency is occurring.

IF THERE IS A FIRE OR RISK OF AN EXPLOSION, **EVACUATE THE BUILDING IMMEDIATELY** and call emergency services from a cell phone or another building.

Nearest Medical Facilities:

***Students*: Student Health Services, 126 Downs Hall, x74880,** shnurses@kean.edu
(only while school is in session – otherwise see below Urgent or Emergency care centers)

***Employees*: Contact supervisor and go to nearest Urgent Care Center or Emergency Room.**

Nearest urgent care center:

MD Care Urgent Care Center
400 Westfield Ave, Elizabeth, NJ 07208
(908) 691-3800

Nearest emergency center:

Overlook Medical Center Emergency Services - Union Campus
1000 Galloping Hill Road, Union, NJ 07083
908-522-6300

STEM & East Campus Building/Facilities Manager (contact for building-related issues)
Alonso Losada x75848 or (cell) 908-377-5803 alosada@kean.edu

STEM Safety Officer: Nan Perigo ,STEM 118; x77227 (908-737-7227) nperigo@kean.edu

KEAN Safety Officer: Suzanne Kupiec, x74804 (908-737-4804) skupiec@kean.edu

STEM Main Contact Information:

Nan Perigo, Research Facilities Manager x77227, STEM 118, nperigo@kean.edu
Marianne Gass, Assistant to the Dean, x77204, STEM 513, mariannng@kean.edu
Keith Bostian, Dean and ILSE Director, x77220, STEM 513, kbostian@kean.edu

Section 8. (Appendix 2A) Chemical Hygiene Plan (CHP)

CHP under separate (yellow) Section

Section 9. (Appendix 4D) Bloodborne Pathogen Exposure Control Plan (ECP)

ECP under separate (pink) Section