

SAFETY Documents

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SAFETY TRAINING REQUIREMENTS

All safety training must be complete *PRIOR TO LABORATORY WORK!*

A. Plan A Graduate Students, Post Docs, Faculty/Staff working in East Lansing's Chemical Engineering and Materials Science Labs and Faculty Supervising Personnel in These Roles.

Chemical Hygiene and Laboratory Safety -- through <https://ora.msu.edu/train> - Once
Online Research Laboratory Security Training - through <https://ora.msu.edu/train> - Once
Departmental Informed Consent Form - Once
Site-Specific Training (Documented on Consent Form)¹ - Once (updated as needed)
Departmental Refresher - Annually
Hazardous Waste Refresher - Annually

If applicable:

Hand and Power Tools - Once
Compressed Gas Cylinder Safety - Once
Lock Out/Tag Out - Once
X-ray Safety Training - Once
Autoclave - Initial/Annual Refresher
Biosafety Principles - Initial/Annual Refresher
Bloodborne Pathogens - Initial/Annual Refresher
Hearing Conservation - Initial/Annual Refresher
Radioisotopes - Initial/Annual Refresher
Respirators - Initial/Fit Test Varies

B. Independent Study Students, Undergraduate Employees, Senior Thesis Students working in Labs

Same as in category A above except Annual Department Refresher is not required.

C. Staff and Plan B (non-thesis) graduate students Not Working in Lab

Hazard Communication – through <https://ora.msu.edu/train> - Once
Departmental Informed Consent Form - Once

D. Affiliates Working in Other Locations

Safety training and seminars provided by a safety officer at that location. Consult departmental safety representative.

¹ Site-Specific Training: Your supervisor will discuss the type of activities you will be doing in the laboratory and will provide site-specific training.

SAFETY COMPLIANCE GUIDELINES

Each faculty, staff member, and student is responsible for his/her own safety in the conduct of experiments.

1. Each supervisor, principal investigator, etc. is designated as a Project Director (P.D.) Each Project Director (P.D.) is responsible for safety in the laboratories under their direction. This shall include:
 - a. Becoming knowledgeable about the hazards in the laboratories.
 - b. Establishing written laboratory specific standard operating procedures (SOPs) and keeping copies in the laboratory safety notebook or on a computer in the laboratory.
 - c. Research Labs: Providing computer access to all materials safety data sheets (M/SDSs) via a computer (on-line or off-line) or maintaining a file of M/SDSs within each laboratory or group of laboratories where chemicals are used. However, all extremely hazardous chemicals (e.g., peroxides, class A carcinogens, and HF) M/SDSs should be kept in a file or posted at appropriate places in each laboratory where the chemicals are used.

Laboratory Courses: Printing M/SDSs in a notebook and keeping within the laboratory.
 - d. Ensuring that an annual Hazardous Substance Inventory is completed and kept on file. The P.D. will review the inventory to be aware of chemicals that should be treated as hazardous waste.
 - e. Ensuring that all personnel are aware of the risks involved in their work, including **posting** of the following:
 - i. Poster telling where M/SDSs can be found, as required by Michigan law.
 - ii. Placard on doorway exterior with emergency phone numbers and hazard labels

- f. Providing background for Independent Study/Project students on the following topics prior to student enrollment:
 - i. M/SDS Forms
 - ii. MSU Chemical Hygiene Plan
 - iii. MSU Right-to-Know Hazardous Communication Document

These documents are available at <https://ehs.msu.edu/>.

- g. Supplementing University and Departmental training for unique hazards in each laboratory, and assuring that safe practices are followed and evacuation procedures are established. Laboratory specific training shall include the following:
 - i. Departmental safety rules
 - ii. Specific hazards and disposal procedures for chemicals in your laboratory
 - iii. Specific physical hazards, i.e. hot surfaces, pinch points, rotating equipment, lock out/tag out, UV, laser light sources, electrical hazards
 - iv. Requirements for dress, eye protection
 - v. Laboratory safety equipment, its location and use
- h. Signing the Departmental Informed Employee/Student Consent Form for each employee or independent study student assigned to his or her laboratory.
- i. Assuring that bi-weekly “short list” compliance checks are made and recorded on-line so that the department can keep track of the inspections. The link for online reporting is available after logging into the departmental database.

2. The Department will be responsible for safety matters and will:

- a. Ensure the compliance of the following for all CHEMS Affiliates according to the Safety Training section of this document.
- b. Conduct an annual seminar giving an overview of chemical safety, outlining the necessary precautions, and clearly noting how to access these safety regulations.
- c. Nominate a faculty member to membership on the College Safety Committee. This person shall:

- i. Coordinate with EHS all Departmental safety inspections.
 - ii. Coordinate correction of safety hazards identified.
 - d. Coordinate safety inspections of all laboratories in cooperation with the College Safety Committee and/or EHS.
 - e. Prepare annual safety report in cooperation with the College Safety Committee.
- 3. Laboratory Courses. The faculty-in-charge of the course is responsible for:
 - a. Designing experiments to minimize hazards.
 - b. Establishing safety rules and regulations for all instruction and student personnel.
 - c. Maintaining a file of M/SDSs.
 - d. Ensuring that all personnel are aware of the risks involved in their work, including **posting** of the following:
 - i. Hazardous Substance Inventory
 - ii. Safety Rules and Regulations (one page)
 - iii. Poster indicating where M/SDSs can be found.
 - e. Assuring compliance with safety rules.
 - f. Training students and teaching assistants in safety.
 - g. Obtaining a "Classroom Laboratory Safety Agreement" from all students and teaching assistants. The completed form will be kept on file in the Department of Chemical Engineering and Materials Science Office.
- 4. Research Group Safety Representatives. Each project director will appoint a safety representative. In the event that a project director has laboratory facilities in two or more locations, more than one safety representative may be appointed. The safety representative will assist the project director by:
 - a. checking that all laboratory workers have completed the required safety training;

- b. coordinating annual inventories of laboratory chemicals;
- c. serving as research group contact for safety communications from the department;
- d. performing bi-weekly inspections using the departmental "Bi-weekly Laboratory Inspection Checklist" and recording the inspection results on-line. The bi-weekly checklist is:

One of the following applies:

A) The listed room is a shared office space. All personnel have received required training for the laboratory work they perform in other spaces.

or

B) The listed room is a laboratory or storage location. If the room to be inspected serves only for storage, compliance with Items 5-9 and 11 is sufficient.

1. All personnel have received required training.
2. Eyewash is unobstructed and has been tested/flushed on a weekly basis.
3. Food/Beverage is not used or stored in the lab.
4. Spill kits are available and complete.
5. All personnel working in the room know the location of the nearest fire extinguisher.
6. Gas cylinders are properly secured.
7. Peroxide forming agents were dated when opened and are not expired.
8. Hazardous waste containers are labeled and dated upon first use.
9. Waste tags are complete.
10. Biohazard waste containers are available for sharps and none have accumulated beyond 90 days.
11. No waste has accumulated over 90 days.

LABORATORY SAFETY RULES AND REGULATIONS

The safe conduct of all experiments is the responsibility of each student. You will be expected to follow the guidelines set forth below:

1. Know the location of safety equipment in and near the laboratory. Know how to use each item. These items include:
 - a. Safety shower
 - b. Fire extinguishers
 - c. First aid kits
 - d. Eye wash station
 - e. Fire blanket
 - f. Telephone
 - g. Material Safety Data Sheets (M/SDS)
 - h. Chemical spill kit
2. Report all hazardous situations to your professor.
3. Report all injuries to your professor.
4. Wear protective glasses in compliance with MSU guidelines and lab specific SOPs. Soft contact lenses should not be worn in a laboratory where hazardous chemicals are in use.
5. Refrain from drinking or eating in the lab.
6. Learn and avoid the hazards associated with the equipment you will use in your experiments.
7. Avoid horseplay.
8. Know the hazardous characteristics of the materials you will be using in your experiment. Know where M/SDSs are located. Incorporate suitable precautions into your lab work.
9. Become conscious of safety--make suggestions, assist others in maintaining a safe working environment.
10. Do not wear open-toe shoes or ties; tie back long hair and scarves; secure loose clothing; have legs covered down to the ankles.
11. All employees, graduate students, undergraduate independent study students working in labs must sign the "Informed Employee Consent Form" before working in the laboratory.

CLASSROOM LABORATORY SAFETY AGREEMENT

Lab Course

Room #

Instructor

Work in a laboratory exposes a person to risk of injury and illness from hazardous materials and equipment. The risks associated with working in this lab have been explained to my satisfaction, and I have had the opportunity to ask questions about them.

Regulations and guidelines, however well-conceived, are not sufficient to achieve safe laboratory practice. It is the skill, knowledge and basic common sense of the individual laboratory worker that is crucial to a safety program. To this end, each person working in a laboratory assumes the following responsibilities:

1. To attend safety seminars when asked and to read all safety materials issued (such as manuals, hazard alerts, etc.). If new hazards are observed, these should be communicated to the instructor and the unit safety committee.
2. To comply fully with all established safety regulations and practices and to consult the instructor for advice in circumstances where safe practice is in doubt.
3. To limit laboratory work to projects authorized by the instructor.
4. To warn visitors to the laboratory of existing hazards and, when necessary, to inform them of the Department and University safety regulations. Warning signs shall be properly displayed and maintained. Unoccupied laboratories must be locked.

Note: to be completed for laboratory courses including
ChE 316, ChE 472, ChE 481, laboratory sections of ChE 491
MSE 250, MSE 331, MSE 381, MSE 451, MSE 466

I have read and understand the responsibilities on the Classroom Laboratory Safety Agreement and agree to observe them in my laboratory work. I have also read the Safety Rules and Regulations for this laboratory. I know where to locate the M/SDS in the laboratory. Prior to an experiment, I will familiarize myself with known hazards of the materials involved in my experiment. I agree to observe the regulations in this course.

Signing of this Classroom Laboratory Worker Safety Agreement is not a waiver of individual rights of redress in case of injury.

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| 4. _____ | 19. _____ |
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| 12. _____ | 27. _____ |
| 13. _____ | 28. _____ |
| 14. _____ | 29. _____ |
| 15. _____ | 30. _____ |

Instructor _____ Date _____

TA _____ Date _____

Departmental Informed Employee/Student Consent Form

I understand that this statement does not legally bind me in any way, nor does it negate any employee rights as set forth in the Employee Rights and Responsibilities handbook. I further understand that this statement of consent is required strictly as an acknowledgment that I have completed the requisite training for my particular job description at Michigan State University and that I agree to fulfill those duties safely, to the best of my ability. Understanding this, I verify that (initial blanks for completed training):

1. I have consulted the Environmental Health & Safety (EHS) training guide (<https://ehs.msu.edu/lab-clinic/index.html>) for an overview of the training options available to me. I have received training concerning (check those that apply):
 - Hazard Communication
 - Chemical Hygiene, Laboratory Safety, and Hazardous Waste (includes Hazard Communication)
 - Radiation Safety (including X-Ray)
 - Biosafety Principles
 - Compressed Gas Cylinder
 - Autoclave Safety
 - Other (specify all that apply) _____

2. I know where to find material safety data sheets (M/SDS) for each hazardous chemical in my work area and how to read them.
3. I know how to access the University's Chemical Hygiene Plan, Radiation Safety Manual, and/or Biosafety Manual, for the related safety course(s) I have completed and checked above.
4. I know where to locate a copy of the Hazardous Waste Disposal Guide. I understand the proper procedures for labeling and disposal of all chemical, biological, or radioactive wastes which I will encounter. I understand that chemical wastes can be explosive if incompatible wastes are mixed. I understand that I will be required to complete an annual refresher course on Hazardous Waste if I routinely handle chemicals.
5. I have reviewed the CHEMS Departmental SAFETY RULES AND REGULATIONS, <https://chems.msu.edu/resources/safety> .
6. I have completed site-specific training as described in the Chemical Hygiene Plan including:
 - the procedures in my work area that involve hazardous chemicals;
 - the physical and health hazards that the chemicals in my work may present;
 - the measures I can take to protect myself from accidental overexposure to hazardous chemicals;

- the methods and observations for detecting the release of any hazardous chemical in my work area.
- an awareness of the need to update site-specific training as necessary.

Employee/Student Signature, Job Title, Department

Date

Printed Name

Permission is hereby granted to the above individual to conduct work under my supervision. I have supplemented the above documented University and Departmental training for this individual with discussions of identified hazards in their specific workplace, as outlined in the Departmental Safety Rules and Regulations and the MSU Chemical Hygiene Plan.

Principal Investigator Signature

Date