College of Natural Sciences & Mathematics

Safety Program Manual

CNSM Science Safety Office

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Introduction

This Safety Manual is a key part of the CNSM Safety and Environmental Protection Program which is designed to protect students, the general public, and all College of Natural Sciences and Mathematics (CNSM) personnel from health hazards and injuries associated with College operations. The campus **Injury and Illness Prevention Program** (IIPP), the campus **Hazard Communication Program** (HAZCOM or "Right To Know"), and the **CNSM Chemical Hygiene Plan** (CHP) for laboratory workers are all part of the CNSM Safety Program.

This manual endeavors to make all employees aware of the presence of and risks associated with potential hazards in the workplace, and presents the rights and obligations of employees according to California Occupational Safety and Health Administration (Cal/OSHA) regulations. It includes Standard Operating Procedures with a focus on personal safety, and addresses protection of the environment per local, State and Federal regulations.

Updates to the Manual and other important safety information are conveyed to personnel periodically via email and via the CNSM Safety Website, which is updated regularly. Each person who supervises the work of others must inform the supervised individual(s) (students included) of these updates as applicable, and incorporate any necessary changes into existing operations. Note that the CNSM Science Safety Office website always presents the most current version of the Manual and other guides. Visit this site often to ensure that you remain current with CNSM policies and procedures.

If any portion of the Manual or website provides information in conflict with an earlier communication, the most recent guide must be adopted as the current policy of the CNSM. Additional Safety Program information is presented on the Official Workplace Safety Bulletin Board, near the doorway near HSCI-160. All guidelines, references and regulations referred to in this Manual are available for your review in the CNSM Science Safety Office in MIC-207.

1. Safety Structure and Policy for the College of Natural Sciences and Mathematics

Primary responsibility for the safety of people and protection of the environment at CSULB rests with the President and is generally communicated through the CSULB Office of Environmental Health and Safety (EH&S, x52283). The University in turn delegates to Deans and Department Chairs the responsibility for addressing the specific Environmental Health & Safety needs of each College.

Dean of the College of Natural Sciences and Mathematics

The Dean of CNSM, via the CNSM Science Safety Office, is the administrator of the CNSM Safety and Environmental Protection Program. The Dean and/or Department Chairs will take action to correct potential problems within the College that have been identified, and will initiate disciplinary action against employees and students who refuse or fail to follow established procedures.

CNSM Science Safety Office

CNSM Science Safety Office personnel Radiation Safety Officer/Chemical Hygiene Officer (CHO) and Alt. Radiation Safety Officer/CHO, under the direction of the CNSM Dean, manage the CNSM Safety and Environmental Protection Program and the University-wide Radiation Protection Program in conjunction with appropriate committees. CNSM Science Safety personnel review and evaluate various activities, projects and research programs from a safety and environmental standpoint; maintain most EH&S-related employee records, and coordinate compliance with Federal, State, Local and University regulations and policies. CNSM Science Safety Office personnel investigate reported accidents and problems within the CNSM; assist committees, Department Chairs, Faculty and Staff to remedy EH&S problems; provide or coordinate specialized training classes; and are available to review instructional programs for EH&S provisions, etc.

Department Chairs

Department Chairs, with the assistance of the CNSM Science Safety Office and any Department safety designee(s), must adequately address hazards associated with Department operations, including those activities associated with student groups, volunteers, and Foundation employees. The Chair must make every effort to ensure that only competent, trained individuals are supervising others and/or working in hazardous environments. Written procedures and specific training programs for employees/students may be developed and implemented at the Department level. These programs should be sent for review/approval by CNSM Science Safety.

CNSM Environmental Health and Safety Committee

The CNSM Environmental Health and Safety Committee (EH&S) is assembled as needed and is composed of a Staff member and Faculty representatives from each Department. The CNSM EH&S Committee may review matters of College wide significance and report to the Dean.

Mathematics and Statistics Department

The Mathematics and Statistics Department and select non-technical employees, while still covered by the CNSM Safety program, may participate in an abbreviated version of introductory safety training. This

level of introductory safety training is termed "Basic." Basic level trained personnel may not handle chemicals or do hazardous work.

Staff, Faculty, and Administrators

Staff, Faculty and Administrators (including volunteer employees and Foundation-paid personnel) are required to ensure that the appropriate level of Safety and "Hazard Communication" (HAZCOM) training (see item "2." below) is provided to all persons under their supervision, including service personnel, visitors etc. All personnel, including students, must be informed and adequately trained with respect to any potentially hazardous materials or operations present in the workplace/instructional setting. This training should be documented; forms are available from the CNSM Safety Office and their website. Training documentation should be retained or forwarded per Department policy.

All Personnel

All personnel, including students, are required to work safely and never undertake or assign a task in the absence of adequate knowledge, training, engineering controls and personal protective equipment (PPE). Safety is the responsibility of everyone within the College of Natural Sciences and Mathematics. Anyone aware of a health, safety or environmental problem, including unsafe conditions or suspect exposures, must report it appropriately and pursue an effective resolution. Employees have the right to view records (available in the Central EH&S Office or through the CNSM Safety Office) relating to medical surveillance, exposure monitoring and other activities or data relevant to occupational safety and health.

All members of the College are charged with adhering to the policies and procedures of this Safety Manual, and overseeing the safe work of all individuals frequenting areas under their supervision.

2. Safety Training, Hazard Communication, Chemical Hygiene Plan & Safety Data Sheets

A. Employee Introductory Safety Training

Each supervisor, as described in the introduction, is responsible for ensuring that all employees she/he supervises or directs have completed the Introductory CNSM Safety Program Training.

This training mandate applies to Work Study (WS), Student Assistant (SA), Teaching Associate (TA), Graduate Assistant (GA), Staff, Faculty, Adjunct, Volunteer, and Foundation-paid personnel, etc. **This training must be completed BEFORE assigned work is begun.** This training is also required for students engaged in potentially hazardous work with minimal supervision, e.g., students working in research labs.

All employees must complete all elements of the CNSM Safety Program Training, consisting of:

- Completing CNSM General (introductory) Safety Training, which is web based or presented live by CNSM Safety and coordinated through Department Offices and/or individual supervising Faculty/Staff. This training is required for all lab personnel and has a three-year refresher requirement. Office personnel must complete CNSM Office Worker Safety Training.

- Reading this Manual, including Manual updates/refresher training conveyed via email notification, and including any appropriate supplemental safety policies/procedures (available from CNSM Science Safety).
- Passing the website exam, printing off the Safety Program Form and taking the form to the supervisor for signature.
- Returning the completed "Safety Program Form" in person to CNSM Science Safety (MIC-207) personnel within 14 days of passing the safety quiz.

Each supervisor (faculty, staff or administrator) is responsible for providing information and training to each supervised individual regarding the *specific* hazards to which she/he may be exposed while performing her/his job duties. This training shall be provided at the time of initial assignment and whenever a new type of hazard is introduced into the work place. No employee may direct an inadequately trained student/employee to perform a hazardous operation. Faculty are responsible for making every effort to ensure the safety of individuals associated with student projects they approve/oversee, and the protection of the environment.

Task-specific training should be documented by project supervisors on sign-up sheets and after lab meetings. Documentation is *required* for certain operations; check with the CNSM Safety or EH&S website if you are not sure. This training shall include the following where appropriate:

- Physical and health hazards of equipment, chemicals, or other materials
- Electrical safety
- Proper precautions for handling
- Necessary engineering controls, personal protective equipment (PPE), or other safety precautions to minimize or prevent exposure or injury and chronic health effects
- Possible signs and symptoms associated with the overexposure to a hazardous substance
- Exposure limits
- Methods used to detect the presence or release of a hazardous chemical
- Emergency procedures for spills, fire, theft. etc.

B. CSULB Hazard Communication (HAZCOM) Training and CNSM Chemical Hygiene Plans

This Manual incorporates the provisions of the CSULB HAZCOM and CNSM Chemical Hygiene plans, available for employee review in the CNSM Science Safety Office. The main purpose of these plans is to:

1. inform employees of, and protect employees from, the health hazards present in the workplace.
2. keep exposures below regulated limits.

These plans also describe training requirements, and the HAZCOM plan is linked to a list of hazardous materials used or stored on this campus.

C. Safety Data Sheets and "Right to Know"

The "Right to Know" is an important part of the HAZCOM Plan and refers to an employee's right and responsibility to be informed about hazards present in his/her workplace. This right makes the proper labeling of containers essential (full NAME and HAZARD; see label policy below). Right to Know laws also give employees the right to access medical records, exposure history, and workplace exposure survey data held by the employer for that individual as well as for other employees with similar duties.

Product manufacturers are required to supply health and safety information for their materials in the form of a Safety Data Sheet (SDS). All employees within CNSM have the right to see a SDS for any hazardous materials used in their work areas, and each person should read and understand an appropriate SDS before a material is used.

Before beginning work, **all employees must know the possible hazardous properties of, and appropriate precautions/PPE for working with, any potentially hazardous material or equipment.** Note that a hazardous material may be "hidden," such as the refrigerant in a freezer, oil in a pump, acid in a battery, etc.

Most current SDS must be maintained (either in hard copy or electronic form) and readily accessible in the work area for each hazardous material that can be ingested, inhaled or absorbed. Each SDS must be for the specific chemical on hand. Electronic access as an alternative to maintaining paper copies must not have any barriers that would prevent immediate employee access.

Acceptable means of electronic access include creating a storage file on a lab computer or the "SDS" software tool that is part of the Risk & Safety Solutions (RSS) software package. All employees must know how to interpret an SDS. If you need additional instruction, ask your supervisor or contact the CNSM Science Safety Office.

Any CNSM employee who supervises the work of another is **required** by Cal/OSHA law, to provide employees SDS information about chemicals/materials to their employees. Please note that Cal/OSHA posters describing workplace HAZCOM information are posted on the official CNSM bulletin board located near the doorway to HSCI-160.

3. Student Safety Training

All laboratory instructors, and project advisors of 495/496-type students must address laboratory safety by presenting all pertinent sections of the "Instructions for Student Safety Verification Form" to their students and then obtaining their signatures on the "Safety Instruction and Verification" form after filling out the form as appropriate. Both documents are available from your Department Office at the beginning of each semester (Chemistry instructors must obtain theirs from the Chemistry Issue Room) and must be returned to Department Offices upon completion. Scripts are also available online to assist instructors with presenting this important safety information.

Course Coordinators and others who develop lab exercises must ensure that appropriate safety information is incorporated into their Lab Manuals and lab procedures. For example, TAs, GAs, and students all need to know that chemical splash goggles are required whenever there is the risk of a chemical splash; what steps require a fume hood; how each chemical must be collected as hazardous waste, etc.

4. Room Entry Restrictions

CNSM has established a set of Lab Security Regulations which are posted in all research labs. These regulations shall be adhered to by all CNSM personnel.

An "access label" has been placed above nearly every non-office door lock in the CNSM to help ensure the safety of unescorted outside people and to protect sensitive assets. These labels indicate the level of training needed to safely enter the room. Anyone wishing unescorted entry to rooms labeled "Special Permission Required" must first receive the "CNSM Access Training" instructing the person on basic issues such as special hazards sometimes present in labs (radioactive materials, biohazards etc.), how to read and understand labels, how to use the shower/eyewash, and mandates such as never move chemicals, never throw broken glass into the trash cans, never drink or eat in labs etc. This training can be given by CNSM Safety or FM/University Planning supervisors, etc.

The training guide can be printed from the CNSM Science Safety Office website and handed out as appropriate (documenting this training is essential and the website has such forms available. Nearly all Facilities personnel and custodians have been so trained.

Help out by making sure that:

1. Hazardous items in the workplace bear clear warning labels/signs.
2. Temporary KEEP OUT sign(s) are posted as necessary.
3. Persons found to be working in an unsafe manner are corrected and/or ejected.

Please notify the CNSM Safety Office or your department chair if outside personnel are compromising your safety, or the safety of others.

5. Mandate for Continuous Oversight During Lab/Class

Instructors must provide continuous oversight during lab/class sessions. The presence of the instructor in the laboratory/classroom is required in order to respond to problems and to ensure that safety rules are enforced. Except for brief intervals, instructors must not leave their class during laboratory/class sessions.

6. Faculty Responsibility for Academic/Research Project Safety and Cleanup

Faculty are responsible for knowing, communicating and enforcing the health and safety aspects of any thesis project/directed research they approve. Faculty advisors must carefully review proposed materials and methods, and help the students select the safest methods possible. Project chemicals must be listed on the faculty's Chemical Inventory spreadsheet; the faculty member is responsible for the proper labeling, storage, use and disposal of these chemicals. It is easy to forget the "how-to" details with respect to the above; please feel free to call the CNSM Science Safety Office (x55623) for more information or assistance or visit the website.

Faculty are ultimately responsible for the clean-up of ALL materials generated by their students, including samples, notebooks, dirty glassware, hazardous waste, materials stored in refrigerators,

freezers, incubators, cupboards, fume hoods etc. Many faculty have had to deal with these unwanted leftovers and the task can be unpleasant. Please ensure that your students perform a thorough clean-up of their materials prior to leaving your lab. Contact CNSM Science Safety Office for disposal of unwanted chemicals.

7. Disciplinary Policy

As required by Cal/OSHA, Union contracts and University policy, a system of progressive discipline is in place. This system is designed to promote corrective action upon the discovery of an employee who does not follow established EH&S policies, thereby endangering her/himself and others. Discipline of students is coordinated by the campus Office of Student Conduct and Ethical Development.

8. Control of Exposures to Chemicals and Other Hazards

A. Hazard Identification and Minimization

Supervisors and instructors are responsible for recognizing potential hazards in any areas they work in or occupy. Operations considered hazardous or of unknown risk must not be performed until the supervisor or instructor has carefully identified and evaluated the potential hazards, has approved the procedure, and has given appropriate instructions regarding safe procedures and any necessary control measures to be implemented.

Departmental and CNSM office approval must be granted and special control measures implemented before particularly hazardous substances/equipment are used, e.g. human blood products, recombinant DNA, radioactive materials, lasers, x-ray units, some regulated carcinogens and drugs, etc. In some cases formal University approval may be required through the EH&S office. No employee or student within the CNSM may perform a hazardous operation using equipment, materials or techniques which she/he feels is unsafe or dangerous.

Whenever hazards not addressed in this Manual are encountered, more specific or detailed safety information must be obtained. Reference sources and Manual supplements regarding specific hazards and procedures are listed at the end of this manual. The employee's supervisor, Department resources and/or the CNSM Science Safety Office should be consulted if any doubts or questions arise. Each new major project or program, and major revision of existing projects, must be evaluated from a safety standpoint e.g., the degree of risk arising from exposure to chemical, physical and biological agents, the control measures needed, etc. Hazards identified in the evaluation must be appropriately addressed.

B. Exposure Control

Fumes, vapors, radiation, dust, mist, smoke, contaminated surfaces etc. cannot always be eliminated from the work place. Departments as well as individual employees must make every effort to keep exposures to hazards below the limits for Cal/OSHA regulated substances, or recommended exposure limits for other hazards where there are no specific Cal/OSHA standards. Safety Data Sheets (SDS) and the National Institute for Occupational Safety and Health (NIOSH) Guide (available in the CNSM Science Safety Office) may be used to obtain this information.

Airborne concentrations of chemicals/particles shall be monitored if there is reason to believe these levels are being exceeded. Campus EH&S personnel typically perform or coordinate this monitoring.

CNSM personnel shall take the following measures to **reduce exposure to workplace hazards**:

1. Engineering controls e.g., hoods, mechanical safeguards, needle boxes, warning lights/alarms, interlocks, etc.
2. Administrative controls e.g., chemical substitution, limiting access and exposure time, composing and following specific SOPs.
3. Personal protective equipment e.g., proper gloves, goggles, labcoats, aprons, portable shields, proper footwear, etc.
4. Safe work practices e.g., uniform container labeling, the prohibition of eating and drinking in the lab, use of double containment trays, the buddy system, etc.

9. Reproductive Health

Male or female, you should never work with a chemical or radioactive material without knowing how it may affect the reproductive system, and the length of time the material could remain in your body if ingested, inhaled or absorbed. The use of some agents should be stopped well in advance of conception. If you are concerned about reproductive health, you should consult your physician to evaluate the any potentially hazardous materials and procedures in your workplace. CSULB has an effective Reproductive Health Policy in place.

Please feel free to contact CNSM Science Safety Office or Campus EH&S with any further requests for information.

10. Medical Monitoring for Workplace Health Hazards

The University Medical Monitoring Program as defined in the IIPP is designed to protect employee health and to ascertain the effectiveness of hazard control methods. Appropriate medical surveillance, consultations and exams shall be provided to employees who work with specific hazardous chemicals or agents and/or when certain criteria are met e.g., symptoms of illness present, possibly related to such exposure; hazardous material exposure level above the action level; hazardous materials spill, leak or other event that made exposure likely. This medical process will be at no cost to the employee, without loss of pay and at a reasonable time and place. Contact the CNSM Science Safety Office for details.

11. Ergonomics

Unhealthy work habits in keyboard operation are a common source of ergonomic complaints; aches, pains headache, etc. If not addressed promptly, serious injuries can arise.

Use common sense to minimize ergonomic problems in your workplace and strive to comfortably configure your workstation. Where possible, schedule computer tasks into multiple sessions rather than a single block. Break from the tasks as needed to minimize stress and strain. Specially designed aids such as ergonomic chairs, wrist rests etc. can be purchased which can lessen the chance of these injuries.

Contact the CNSM Science Safety Office for information on obtaining an evaluation of your work station.

12. Employee and Student Injuries

Use campus emergency call box or Dial 911 on any campus phone in emergency situations to reach CSULB Police. Avoid using 911 on cell phones as the Highway Patrol may be alerted instead of CSULB Police, thus delaying response.

Injuries sustained by employees (including student employees) while performing job duties are termed "occupational" or "industrial" injuries and must be reported to the supervisor and the Campus Workers' Compensation Manager. The CNSM Science Safety Office should also be notified. Foundation employees must additionally report such injuries to the Foundation Office.

Injured employees will be treated/evaluated by the University's health care provider. Injuries sustained by students while performing non-occupational duties are not occupational injuries; students injured in this manner should be treated at the Student Health Center and/or under any personal health insurance policy.

CSULB will not pay or reimburse for the treatment of injuries to students who are not CSULB employees. Student employees, however when injured while "on the job" (Teaching as a TA, lifting items while a student assistant) are fully covered by Workers Compensation insurance and are treated as regular employees, as are dean-appointed volunteers.

13. Fire/Emergency Procedures

DIAL 911 FROM A CAMPUS PHONE OR USE AN EMERGENCY CALL BOX. PERSONAL SAFETY IS OF PRIMARY IMPORTANCE. DO NOT ENDANGER YOURSELF OR OTHERS.

Initiate building wide fire evacuation or other building-wide emergencies by activating one of the hallway fire alarm boxes. **Learn the locations now.**

When possible, call 911 from a campus phone and give the exact location (this number may be used for any emergency). Instructors and others are encouraged to add the campus police phone number to personal cell phones (562 958-4101). This number is answered by the same dispatcher that answers 911 calls from campus phones.

You can also use the EMERGENCY PHONE BOXES located throughout campus and in CNSM hallways and elevators. Just push and release the button. You will automatically be connected to University Police with your location relayed. If safe to do so, remain available to direct responders to the site, and to provide information on any special hazards present such as chemicals or radioactive materials. If possible, send someone out to "flag down" the response team, and escort them to the problem.

Employees trained in fire extinguisher use may control very small fires by use of fire extinguishers, providing the employee does not endanger her/his own personal safety or the safety of any other individual. Most hallways and some laboratories have a fire extinguisher available; check the location of your nearest unit. Campus EH&S personnel provide periodic training in fire extinguisher use.

If fire is uncontrollable by simple measures, **close any open doors** in the location if it is safe to do so. In HSCI and MLSC fire doors close automatically when an alarm/smoke detector trips. Everyone must **take their personal items** (backpacks, car keys, etc.) and **evacuate the building**; do not lock doors.

The campus has an Emergency Operations Plan that calls for evacuation using the alarm system. Drills are held periodically. The Plan calls for orderly egress, sometimes directed by personnel in vests and/or

hard hats, to designated Evacuation Assembly Areas when the alarm sounds. If directed to evacuate, personnel must do so immediately. Instructors must lead their classes/students 100 feet away from the building and maintain order.

When directed to evacuate during a power outage, take essential personal belongings if it is safe to do so, as reentry may be delayed. It may be a considerable length of time before you are allowed to return to your area. Turn off the lights and as much other equipment (most notably lab equipment such as hot plates, Bunsen burners, etc.) as possible. **Do not attempt to use elevators.** When leaving the upper floors of a building remember the elevators will not be operating. Anyone trapped inside an elevator should use the emergency phone to contact the University Police for assistance. All operations using hazardous materials must be safely and promptly terminated upon power outage. As per the CNSM Chemical Fume Hood Use Guide, in the event of a hood failure or ventilation malfunction (such as during a power failure), stop work immediately. Do not manipulate hazardous materials in a malfunctioning hood as you will be exposed to the material being handled.

The College maintains *Safety Cabinets*, both stocked with supplies, on the top floor of MLSC and in HSCI-385. These cabinets contain personal protective equipment, spill control material, labels, bottle carriers, first aid and other emergency supplies. The MLSC padlock opens with any building or room key for that building and HSCI-385 is left unlocked. Employees are encouraged to examine the contents. Use these supplies as needed but please promptly notify CNSM Science Safety Office when the inventory is low or items are missing so it can be restocked.

14. Reporting Accidents, Incidents and Unsafe Conditions

CNSM personnel are responsible for reporting any significant accidents, incidents, exposures and unsafe conditions to their department, supervisor and/or CNSM Science Safety Office. The standard Incident Report Form is stocked in the two safety cabinets and can be obtained from the CNSM Science Safety Office Website. The supervisor shall ensure that the report is submitted to CNSM Science Safety Office. CNSM personnel investigate each incident and often recommend or require corrective action to prevent a recurrence.

CNSM personnel should report building problems such as flooding or defective heating, ventilation, lighting, plumbing, electricity, flooring, windows, custodial service etc. to the campus Facilities Management (FM) Help Line at extension 5-HELP (54357). FM will typically send professionals to promptly fix the problem. (You may also contact the CNSM Facilities Coordinator for assistance.)

15. Human Blood Concerns

Cuts from broken glass are among the most common workplace injuries. Helping the victim of a cut is a natural response, but keep in mind that contact with blood may lead to exposure to blood-born pathogens such as hepatitis virus and HIV.

To protect yourself and to comply with Cal/OSHA regulations, do not clean up or dispose of blood or blood-contaminated items yourself. Contact CNSM Science Safety Office for assistance; use the emergency telephones or dial 911 from regular campus phones when appropriate. If you plan to use unfixed human tissue, blood, blood products, etc. in your work/project, see "Biohazardous Agents" below.

16. First Aid Kits

The CNSM has provided OSHA/ANSI compliant first aid kits to most department office and instructional support locations for use in assisting with minor injuries. Additionally, a first aid kit can be found in each of the College's Safety Supply Cabinets located in"

- MLSC (3rd floor elevator lobby, lock opened by any CNSM building or lab key)
- HSCI (Room 385, door opened by HSCI building key)
- MIC (100 level alcove near elevator, lock opened by any CNSM building key)

Kits are to be kept stocked and regularly checked for expiration dates etc. First aid kits shall be used in accordance with established guidelines which are available via the Science Safety Office. Contact Science Safety if you wish to obtain or upgrade a kit.

17. Emergency Eyewashes and Safety Showers

Everyone should be familiar with the locations of the emergency eyewash facilities and safety showers installed throughout the college. No one may work with substances which are corrosive, severely irritating, or are toxic by absorption, unless that person can reach an eyewash/safety shower within 10 seconds.

Affected eyes/tissues must be flushed with water for a minimum of 15 minutes. Never apply chemicals such as bicarbonates to the affected area. Remove contaminated clothing as necessary. Never block the path surrounding a safety shower/ eye wash station.

Safety shower/eyewash training is required by all persons using chemicals that may be damaging to eyes or skin. Contact the Safety Office for details.

18. Housekeeping, Slips, Trips, and Falls

Department Chairs are responsible for enforcing good housekeeping practices within their Department. Poor workplace housekeeping is a violation of Cal/OSHA regulations. Every employee and student is expected to participate in the maintenance of good housekeeping practices within the areas they occupy/use.

Poor housekeeping practices may produce a variety of significant Environmental Health and Safety problems such as pest infestation, blocking of emergency exits/paths, spontaneous combustion of stored material, leaking containers, faded labels, unstable reagents etc. See "Corridor Obstructions" below.

There is no need to maintain a personal collection of more than five empty boxes in your workplace. The CNSM box recycling bin is freshly stocked each week with a wide variety of boxes. Unnecessary empty box storage by faculty and staff is perhaps the #1 housekeeping infraction in the CNSM. Free document shredding service and document/journal/catalogue recycling are available.

Slips, trips, and falls account for a large proportion of workplace injuries and fatalities. Most are caused by hurried or careless work habits, damaged or slippery (often wet) surfaces, obstructions in walkways, poor visibility or unsafe use of stairs or ladders.

Good practices to avoid slips, trips and falls include proper planning of work activities, promptly cleaning up water or other spills, maintaining tidy, well-kept work areas, avoid leaving tools or other materials on floors and not carrying loads large enough to obstruct vision up or down stairs. Only use ladders in good condition and during use fold them out completely, face the ladder when climbing, keep weight centered and keep 3 out of 4 limbs on ladder at all times. When using temporary extension cords, position equipment to avoid crossing walkways or use cord protectors.

Report any potential slips, trips or fall hazards to your supervisor or CNSM Science Safety Office immediately.

19. Sharp Objects and Broken Glass Disposal

We must protect our custodial crew by never throwing broken glass or other sharp objects in the regular trash. Collect broken glass in a small, sturdy cardboard box; when full, label "broken glass", then seal and place by the door for custodial collection or dispose of in the nearest dumpster. Do not overfill the box or make it too heavy. Be sure that all discards are free from toxic/hazardous residues.

Needles, scalpels and other medical-type waste must be collected in a hard, puncture-proof sharps container (available from the Safety Office). CNSM offers sharps containers at no cost and will dispose of your full, closed containers. Call the Science Safety Office for details.

20. Earthquake Safety

The presence of hazardous materials within our College makes even a minor earthquake potentially quite dangerous. The protective measures listed below will lessen the possibility of property damage and personal injury in the event of an earthquake. Anyone who encounters a potential earthquake hazard problem should notify their supervisor and/or the CNSM Science Safety Office.

Note the following guidelines:

1. All bookshelves, cabinets and other freestanding furnishings over six feet tall must be secured in some manner e.g., attached to a wall, the floor, or to each other.
2. All chemicals, glassware, or heavy objects that could present a danger by falling from storage locations must be secured from falling by the installation of safety wires, shelf lips, doors etc.
3. Books or other "non-hazardous" items stored on shelves must be secured by some means when these items, upon falling, would impede exit from or access to a commonly occupied location.
4. In sprinklered buildings nothing may be placed or stored within eighteen inches of below the level of the fire sprinkler heads. In non-sprinklered buildings nothing may be placed or stored within twenty-four inches below the ceiling.
5. In the event of a significant earthquake, the detailed CSULB Emergency Operations Plan will be implemented by campus authorities.

21. Hallways, Corridors, Walkways, and Safety Equipment Clearance

Unrestricted passage through walkways must be available in all occupied areas. Generally, Cal/OSHA dictates a minimum width of 28 inches (8CCR 3229), (2) (b). Building and Fire Codes forbid placement of ANYTHING except metal lockers in building hallways or on the Microbiology/walkways, especially unwanted furniture or equipment. Contact your Department Technician or CNSM Science Safety Office for proper procedures regarding the disposal of these items.

Skateboarding, bicycling, riding scooters, etc., in CNSM hallways is prohibited. Campus Regulations forbid bicycles and non-motorized coasting devices (such as scooters or skateboards) inside buildings, including offices and storage rooms. Motorized coasting devices may be used to travel to campus but must be left at established drop-off zones on the campus perimeter prior to passing through or entering campus. CSULB is a designated dismount zone as electric and motorized scooters are not allowed on the campus interior. See the CSULB website for General Campus Policies for more information.

Access to electrical panels and emergency equipment must be kept clear. Never block the path surrounding a safety shower, eye wash station, fire extinguisher, etc. These exclusion zones are sometimes outlined with yellow tape.

22. Electrical Safety Guidelines

These guidelines were composed with help from Cal/OSHA and State Fire Marshal officials after the college was issued a series of electrical safety citations. Strict adherence to this guide is mandatory in order to keep our workplaces safe.

Faculty and Staff must frequently check their work areas for any unsafe conditions including those listed below and immediately correct any such conditions found. Tags are available from CNSM Science Safety Office to clearly mark unsafe equipment that has been taken out of service pending electrical repair or upgrade. The CNSM Shop assigns high priority to such repairs.

Note that many types of equipment, electrical and/or mechanical, may only be serviced/repaired by Facilities Management or certified contractors. These people will employ the mandatory University "Lock out-Tag out" safety protocols and documentation where appropriate.

Unsafe Conditions - Correct Immediately

1. **Blocked electrical panels**: Do not block electrical panels. Panel clearance requires a minimum of 30 inches width (side to side), and 36 inches to the front. The floor in front of the panel must be completely clear -- no storage is allowed within the exclusion zone. Yellow tape (available from CNSM Science Safety Office) can be applied to serve as a reminder.
2. **Live wires**: Never use electrical equipment with exposed electrical contacts (frequently found on old or homemade items, or on electrical devices where the housing or other safety panel has been removed).
3. **Compromised cords**: Never use power cords with broken/cracked insulation, tape-covered splices, or other makeshift repairs/connections. A functioning "strain relief" must be present on every cord so the wires can't pull loose.

4. **Overloaded circuits**: Do not use multi-outlet plug adapters; use breaker equipped "power strips" instead. Never plug a power strip into another power strip. This practice, called daisy chaining, is prohibited and has lead to numerous State Fire Marshal violations.
5. **Misuse of extension cords**: Flexible power cords may not be used as a substitute for a proper building power outlet. Power cords and extension cords MAY NOT be permanently mounted, run through holes in walls, ceilings, floors, or be run through doorways or windows. Cords must not be attached to building surfaces with tape or nails, etc., or be run behind moldings, walls, ceilings, floors carpets etc. If extension cords must be used for other than a short fixed period of time, use fused/breaker equipped power strips instead.
6. **Lack of grounding**: Don't use ungrounded, "two wire" metal devices (such as a metal incandescent lighting fixture) in unsafe locations or in an unsafe manner as listed below. Cal/OSHA REQUIRES "Three Wire" grounded power cords in each of the following cases:
    - On metal equipment used by persons who must stand in water or on metal, bare earth, bare concrete, or other "conductive" locations.
    - On metal electrical equipment mounted on ungrounded metal items (such as a light on machinery or on a metal table).
    - On equipment that was originally manufactured with a "three wire" cord. *Adapters that bypass the grounding prong of a "three wire" plug are prohibited.*
    - NOTE: "Double insulated" U.L. approved "two wire" metal tools don't need such grounding.
7. **Underrated electrical equipment**: Be cautious in using ordinary electric items in corrosive, explosive (flammable vapors, dust cloud etc.) or wet areas such as outdoors, in "cold rooms", aquarium areas etc. Special insulation, plugs, and outlets may be required; they look different and bear special markings.
8. **Equipment misuse**: Don't use electric/electronic devices that are designed to be securely mounted and grounded (such as "rack mounted" equipment) without such proper mounting and grounding (for example, used while unsecured upon a table). Do not use a plug with the wide prong cut or ground down.
9. **Flexible power cords used to supply power to fixed equipment**: Permanently mounted equipment must get power via conduit; contact Facilities Management electricians for installation.

23. Facility Modification Rules

You must contact both CNSM Science Safety Office and the CNSM Director for Facilities for authorization before beginning procedures to modify fixtures e.g., window coverings, electrical, gas, plumbing, steam, air, vacuum etc. or building structure e.g., walls, doorways, enclosures, etc.

Plans without Science Safety Office involvement can lead to costly delays, termination of the project and mandatory restoration to the original condition. Many jobs may ONLY be done by F.M. or F.M. approved contractors.

24. Junk and Unwanted Items

Never abandon items in hallways of Microbiology, the PH2 basement, and Faculty Offices, or on a loading dock as this is a violation of State Fire regulations. If the item is "electronic waste" (also known as e-waste— most anything that has a circuit board), there are special disposal considerations. Contact your Department property coordinator to arrange for disposal. Most items will require a property survey form.

Faculty and staff who bring in personal items such as furniture, refrigerators, microwaves etc. are responsible for disposal of these items.

Contact the University Property Management Office or your Department contact for guidance on disposal of unwanted University property.

25. Smoking, Eating, and Drinking Prohibition

Smoking is prohibited anywhere on campus as of Fall 2016. Eating and drinking are generally prohibited in all laboratories and hazardous materials storage/use areas, except where "Food OK" status has been granted by CNSM Science Safety Office and Campus EH&S.

26. Driving "On The Job"

Policies and requirements that must be followed by those that will drive on University business are stated in the CSU's Use of University and Private Vehicles Guidelines (updated 2025). This information is summarized in this section and found on: Use of University and Privately Owned Vehicles on University Business. Additional information, including instructions for how to complete defensive driver training, is found on: Defensive Driving.

State employees include paid faculty, staff, student employees and non-paid persons on appointed volunteer status. Foundation paid employees are not considered university employees in this context.

State employees who drive on University-related business using their privately-owned vehicle or who will to drive a State vehicle (including electric carts) must complete the UPD developed Defensive Driver Program in CSU Learn accessible through CSULB Single Sign-On (SSO). This training must be renewed every 4 years. State employees transporting students on field trips driving a University vehicle or in their privately-owned vehicle must have satisfactorily completed the course.

State employees who travel on University business using their privately-owned vehicle must have a current Authorization Form (STD. 261) document on file in their respective department. Only such authorized employees may use their own cars to transport students or drive on job-related errands.

State employees must follow specific travel guidelines to ensure the appropriate insurance coverage (worker's compensation benefits, third party coverage etc.). Each Department has at least one person (usually an office employee) who is trained in the specifics of Travel Authorization and has the official forms used. Please make sure your paperwork is current and on-file prior to traveling on University business. Consult the CSULB website for more information.

27. Foreign Travel

Anyone intending to travel outside of the United States on University business must ensure that their insurance coverage meets University requirements, including coverage for repatriation and emergency evacuation. See Foreign Travel Insurance Program for more information.

28. Transportation of Hazardous Materials

Specific approval from CNSM Science Safety Office or Campus Environmental Health and Safety must be obtained prior to moving hazardous materials (except for modest amounts of "consumer" chemicals) to or from campus. This activity is restricted mainly due to the complex and stringent federal requirements set forth in U.S. Department of Transportation (DOT) regulations (enforced in California by the Highway Patrol).

29. Field Projects and Academic Field Trips

A field trip is a university course-related off-campus activity led by a faculty or staff member and designed to serve educational purposes. A field trip would include the gathering of data for research (such as at a geological or archaeological site), museum visit, participation in a conference or competition, or visits to an event or place of interest.

Additional field trip safety information is available through the CNSM Science Safety Office website. Contact the CNSM Science Safety Office for more information.

All persons who lead field trips or supervise off-campus trips for University-related projects are required to present and discuss in detail the hazards that may be encountered to the intended participants prior to departure on the field trip/project. Trip/Project leaders must ensure that all participant responsibilities, instructor/supervisor responsibilities, safety issues etc. are adequately communicated to all participants.

30. Boat/Watercraft Safety

Boat safety is a college-based program that follows a college Boat Safety Manual. A qualified Boat Safety Officer is appointed by the Dean. All personnel directing University projects involving motorized watercraft shall make sure boat operators have completed the CNSM Boating Safety Training Program and are currently authorized to operate the specific watercraft.

Contact the CNSM Science Safety Office for more information. The Boating Safety Manual is available from the CNSM Science Safety Office website.

31. Hazardous Item Acquisition, Donations, and Storage

A. Acquisition of Hazardous Materials and/or Equipment

Chemical orders and equipment orders are subject to a safety review and may be restricted. Faculty are responsible for chemicals acquired for their use, student projects, and must consider any mitigation of

hazards and special requirements when acquiring hazardous materials. Staff are also responsible for proper management of any chemicals they use or store.

Faculty or Staff who leave campus for an extended period of time (e.g., sabbatical, etc.) should work with the Department Chair to assign to another employee the environmental health and safety responsibilities for any chemicals/hazardous equipment left in storage.

B. Proposed Donations of Chemicals and/or Equipment to CSULB

Administrators, faculty, staff, and chairs may not accept donations of chemicals or equipment without prior approval from the Dean and/or CNSM Science Safety Office. Equipment donations require approval because many items are "restricted" by campus policy for safety or regulatory reasons.

Personnel in the CNSM who wish to obtain a "free" chemical should contact CNSM Science Safety Office as they keep records of amounts and locations of chemicals on campus as required by law. They may be able to find that chemical elsewhere on campus.

C. Storage of Chemicals

Follow these requirements to avoid catastrophic consequences.

1) Amount Acquired/Stored

Do not acquire or store unnecessary chemicals. Chemical containers should be dated upon receipt. Writing the date opened is REQUIRED for ethers and similar peroxide formers. Keep all containers closed when not in immediate use. Contact CNSM Science Safety Office prior to ordering chemicals; they will check the campus inventory and may find the materials for you at no cost. Hazardous chemicals not used within the past three years should be removed from your storage areas. Contact CNSM Science Safety Office or the Chemistry Issue Room for recycling or disposal. Most Ethers open for more than one year, or missing a "date opened" label will be confiscated. Chemicals with incomplete labels or degrading containers are also subject to confiscation.

2) Chemical Inventory

Chemicals must be inventoried upon receipt using the RSS inventory platform. As per direction from campus Environmental Health & Safety, for reactive chemicals the PI/supervisor shall set an expiration date of three years in the RSS inventory system and notify CNSM Science Safety Office that a chemical fitting this description is on their inventory. Continued possession of an expired reactive chemical requires written permission from Science Safety. In this context, reactive chemicals are defined as any chemical described by the Safety Data Sheet or RSS inventory software as being self-reactive, a pyrophoric liquid, a pyrophoric solid, a self-heating chemical, or as chemicals which, when in contact with water emit flammable and/or toxic gases.

3) Transfer of Bulk Chemicals

transfer to smaller containers is permitted, providing the new container is compatible with the material and is properly labeled. Use plastic containers whenever possible to avoid breakage and release of contents. Only small volumes (1qt. maximum) of flammable liquids may be transferred to glass containers. The only exception to this rule is for high purity solvents. High purity solvents may be held in volumes up to 1 gallon (3.8 l) in glass containers. Bulk transfers of flammable liquids require specific grounding and bonding techniques. CNSM Science Safety Office trains people on this procedure. Such training is mandatory if the container is greater than 5 gallons (Lt) are involved.

4) "Double Containment" Storage and "Bottle Carriers"

Whenever acids, bases, organics or other types of hazardous materials in breakable containers are carried out of the laboratory, the bottle(s) must be placed in a transport container i.e. a secondary protective receptacle or a liquid-tight cart. (Bottle carriers) are available in every issue room and from the Safety Cabinets. All persons requesting hazardous materials from the Chemistry Issue Room will either be loaned a transport container or be required to provide their own. Original DOT shipping containers (fiberboard packaging or foam packaging) may be used in lieu of containment devices to transport bottles of hazardous liquids. Double containment must also be employed when hazardous liquids are stored in the lab outside of flammable or corrosive liquids storage cabinets (such cabinets are designed with a containment tray).

5) Compatibility in Storage

Chemicals must be stored compatibly. Incompatible storage can result in violent chemical reaction, fire, toxic fumes, property damage, severe personal injury or death in the event of accidental container failure and resultant mixing of reactive chemicals. Always return chemicals to the proper storage location after use. Incompatible materials (acids/bases, flammables/oxidizers, etc.) must be stored in separate cabinets or be at least three feet apart when stored outside of cabinets. The only exception to this is for quantities less than or equal to 100ml for liquids and 50g for solids stored in separate secondary containment. This exception must be approved in writing by CNSM Science Safety Office and campus EH&S. For additional information, contact the CNSM Science Safety Office for your copy of the CNSM Chemical Compatibility Chart. The BLUE "Corrosive" cabinets in MLSC may be used for either acids OR bases--never both. One may store acetic acid in the flammables cabinet as long as no flammable bases are present.

6) Storage Location

Avoid storing hazardous chemicals near an exit path. Chemical storage shelving must be made of appropriate material and seismically protected with protective lips, wires, etc. Double containment trays are required for hazardous liquids, and may be available through CNSM Science Safety Office. Closed chemical containers may be stored in fume hoods (small amounts only), lab cabinets, flammable liquid cabinets, flammable material refrigerators, acid cabinets, and on earthquake-braced shelves with safety lips. Never store both acids and bases in the same cabinet. Storage in fume hoods must be limited so as not to interfere with proper airflow etc. Special "Flammables Rated" refrigerators are required for storing alcohols and other flammables. Never store flammables in a regular refrigerator or freezer.

7) Storage Area Labeling

Cabinets used to store chemicals must be plainly marked to indicate the hazard within, typically using 4"x 4" labels (flammable, corrosive, acid, base etc.) available from CNSM Science Safety Office.

32. Labeling of Hazardous And Non-Hazardous Materials and Hazard Definitions

Put both **full name and hazard(s)** on every unattended container as follows. Note: if you leave the room for a lunch break, all containers in the room are unattended.

A. Name

Always label each unattended container with the full name of its contents. Write the name on the container or write it on a piece of tape and stick it on the container. Even non-hazardous materials must be labeled.

All materials not stored in their factory-labeled containers must be **clearly labeled with the full name, *NOT* just the chemical formula like "H2O", or an abbreviation like "ETOH" or the structural formula.** You may write a commercial name like Windex™, Alconox™, etc.

Chemical *waste* requires a specific yellow CSULB "Hazardous Waste" label; see below. **Never write the word "waste" on any container unless it also has a preprinted yellow waste label.**

B. Hazard

In addition to the full name as indicated above, all unattended containers of hazardous materials must also have the hazard(s) written/marked on them too; **Biohazard, Carcinogen, Corrosive, Flammable, Oxidizer, Poison, Radioactive, Water Reactive** are the most common hazards.

Hand-write the word(s) OR use a pre-printed safety label that bears the word; this CNSM labeling system is based upon Federal and International shipping regulations (DOT/IATA). Label reminder guides are posted in all CNSM labs and the Science Safety Office website has a list with the information.

Try to make your labeling **durable**. Many inks wash off easily or fade. Chemicals attack tape and stickers. Always completely deface or remove any conflicting label(s) on a container being used for a different material. Hazard information labels on original containers shall not be removed or defaced unless the container is empty and clean (triple rinsed). Clean empty containers may be discarded as regular trash.

C. Definitions of the Hazard Words Used on Labels

Biohazard

Contains biological agents capable of producing disease in humans. Examples include infectious viruses, bacteria, fungal agents, prions, any human blood/tissues etc.

Carcinogen

Contains material that can promote the development of cancerous growths in living tissue. Examples include inorganic arsenic, benzene, cadmium, diaminobenzidine (DAB), formalin etc. See below for a list of these specifically-regulated Cal/OSHA regulated carcinogens. There are many more powerful carcinogenic chemicals, but only the specifically regulated ones must always bear carcinogen labels.

This cancer warning must often be accompanied by another warning word such as "Flammable", "Corrosive", etc. as appropriate.

Combustible

A fire hazard, but relatively difficult to ignite and it burns at a moderate rate. Examples include charcoal, paint thinner, glycerine, oils etc. Combustible liquids have a Flash Point of > 100° F (37.7° C). No specific hazard word/label is required for combustibles, although you may use the word FLAMMABLE.

Corrosive

Can cause chemical burns and may quickly degrade metal and other materials. Examples include acids, bases/caustics, acid anhydrides, amines, etc. Many materials labeled "Corrosive" are not compatible with each other (e.g., acids and bases). Any material with a pH of <2 or >12 is considered corrosive and persons handling such materials must be fully protected.

Explosive

May detonate when subjected to shock, friction, heat and/or electrical discharge. Examples include dynamite, lead azide, trinitrotoluene or detonators etc. Explosives are prohibited on campus. Some materials used on campus (e.g., picric acid, dinitrophenol, dinitrophenylhydrazine) are classified as explosive when DRY, and must always be kept wet. When wet, they are considered simply flammable.

Mixing chemicals such as perchlorates, perchloric acid, azides etc. can create dangerous explosive compounds. Persons who use explosive precursors like these must take steps to prevent creating explosive compounds as accidental reaction byproducts.

Extreme caution must be taken by those whose operations include synthesis of compounds. As an example, N-halogen compounds are known explosives and there has been an incident involving the detonation of a synthesized chemical of this class in the CNSM. Those involved in synthesis work are required to know and communicate all hazards associated with the products they create. Even novel synthesis products must be entered into the RSS inventory system.

EPA Registered Product or Environmental Hazard

A commercial product (disinfectant, pesticide, herbicide, fungicide etc.) that, if misused, can hurt the environment and/or the user. These products must be used and labeled per the original container instructions. Some products may only be used by licensed pesticide applicators.

Flammable

Will ignite easily and burn vigorously. Examples include gasoline, acetone, alcohols, nitrocellulose membrane, powdered metals, alkali metals, phosphorus etc. Flammable liquids have a flashpoint of <100° F (37.7° C) but >20° F (-6.6° C).

If they have an even lower flashpoint (< 20° F or -6.6° C) they are called *extremely flammable* (hydrogen, carbon monoxide, acetylene, propylene oxide, acetaldehyde, diethyl ether etc.). These materials are easily ignited by low-heat ignition sources (steam, heating mantles, etc.). **Label them all as "Flammable" and use extreme caution.**

Oxidizer

A material which greatly accelerates the burning of other materials. Oxidizers must always be kept away from flammable and combustible materials. When an oxidizer mixes with any fuel, an immediate or delayed fire or explosion can occur. Concentrated *nitric acid* and hydrogen peroxide (8% or greater) are two of the most common strong oxidizers.

Oxidizers may NEVER be stored near flammables and may never be stored in a cabinet or refrigerator containing a flammable liquid. The most common oxidizers are as follows:

bromine	bromates	chlorates	chromates
dichromates	iodates	iodine	nitrates
nitrites	ozone	perborates	perbromates
perchloric acid	perchlorates	superoxides	periodates
permanganates	persulfates	peroxides**	

***Note: diethyl ether, isopropyl ether, ethylene dichloride, tetrahydrofuran, potassium metal, and many other chemicals may form explosive PEROXIDES in storage. Write date opened on these and see the "Peroxidizable Compounds" supplement to this Manual. Organic peroxides are the most dangerous oxidizers and can explode with heat, friction or shock.*

Poison

Toxic, fatal, or harmful to humans when inhaled, ingested, or absorbed by the skin. Be advised that materials requiring any of the hazard warnings mentioned in this section of the Manual are usually poisonous as well, although the "poison" label is usually applied only to containers of materials which have no other hazard.

Radioactive

Emits radiation: alpha, beta and/or gamma. Examples include natural uranium ores, self-luminous EXIT signs, specially radiolabeled research materials etc. Safety precautions and rules for radioactive materials are very specialized and all usage must conform to the CSULB Radioactive Materials License. See the CNSM Science Safety Office website for details.

Reactive

Water Reactive chemicals may catch fire, explode, produce flammable/toxic/corrosive gas, etc. in contact with water. Even the moisture in the air can cause a reaction. A list of the most commonly encountered water reactive materials is available on the CNSM Science Safety Office website.

Other dangerously reactive chemicals may be **Air Reactive** (reacts vigorously in contact with air), **Spontaneously Combustible** (undergoes combustion without the addition of heat or flame), **Pyrophoric** (can ignite spontaneously in air), etc. Contact your supervisor for training before obtaining or using these materials as special precautions must be taken for handling and storage. Possession and use of pyrophoric materials requires approval by the CNSM Science Safety Office, the Chemistry Department Safety Committee, and campus EHS.

Contact your supervisor, Department Issue Room, or CNSM Science Safety Office if you are uncertain as to which definition applies to the hazardous material in question. An SDS and other information will be provided.

33. Standard Operating Procedures (SOP) for Workplace Safety

A. Know the Properties of and Safety Requirements for the Hazards in Your Workplace

All laboratory supervisors shall conduct and certify a Laboratory Hazard Assessment using the RSS platform. All laboratory personnel shall be added to the risk assessment as a group member and acknowledge the assessment. Cal/OSHA and common sense require employees to know this information about the chemicals they are using or plan to use, including any required PPE, laboratory building needs, engineering controls (hoods, sprinklers, climate control) etc.

- Consult safety references, SDS's, the CNSM Science Safety Office Chemical Compatibility Chart, etc. Read the container label.
- Handle chemicals following the standard operating procedures listed below
- Contact the CNSM Science Safety Office prior to ordering any regulated carcinogen or other especially dangerous chemical.
- Make sure you know the toxicity, compatibility, reactive properties and environmental issues associated with them.
- Make sure you know all possible resultant reaction products and wastes. Know and employ appropriate storage, handling and waste procedures and support equipment.
- Assume that all substances of unknown toxicity are toxic.
- Find out about, then implement any necessary precautions before acquiring new materials or equipment; your current work area may be inadequate.
- Before acquiring new equipment, ensure that all necessary facility modifications are in place (power source alterations, noise/vibration controls, electromagnetic field controls etc.).
- Know the proper action to take in the event of a spill or accident.

Supervisors must share all of this safety knowledge with those they allow to have access to their work areas.

B. Implement the Appropriate Precautions

1) Enforce the Rules

Supervisors (Administrators, Faculty, Course Coordinators, lab TA's, staff etc.) **must personally employ and enforce** the use of appropriate eye protection and other protective gear such as protective aprons, lab coats, face shields, gloves etc. by their personnel and/or students wherever chemicals are handled. A list of required PPE is generated by RSS upon completion of the laboratory hazard assessment.

When pouring or mixing hazardous materials, work behind a fume hood sash or wear a face shield for extra protection in addition to goggles. **Everyone handling materials that can injure the eyes or skin must work within 10 seconds of a properly functioning eyewash.** A safety shower is normally required as well; see below.

2) Protect your eyes

Chemical Splash Goggles (fully enclosed, indirect-vented) and appropriate chemical resistant protective clothing (i.e. aprons, lab coats, gloves etc.) **shall be worn when working with hazardous liquids and also by anyone working in the "splash zone" or "danger zone"** (a minimum of 10 feet, increasing according to the hazard e.g., potential for hazardous materials splash, explosive reaction, flying particles, etc.). *In CNSM labs, this typically means that one individual handling injurious chemicals in a laboratory necessitates the use of chemical splash goggles by all lab occupants.*

CNSM Science Safety Office personnel may permit the use of appropriate splash shields in lieu of goggles in rare instances, evaluated on a case-by-case basis only. See the RSS Laboratory Hazard Assessment for list of required PPE. Science Safety Office personnel may permit the use of appropriate splash shields in lieu of goggles in rare instances, evaluated on a case-by-case basis only.

Contact lenses are permitted when working with chemicals if worn with appropriate chemical splash goggles. Safety glasses, face shields, chipping goggles, prescription eyewear etc. may not be worn instead of chemical splash goggles.

Face shield, must always be worn *in addition to* chemical splash goggles; never alone when handling hazardous liquids. Face shields must be worn over the goggles when handling liquid nitrogen and anytime such extra protection is warranted.

Anyone unable or unwilling to comply with these policies may not remain in the laboratory/work area. There are no exceptions at any time.

3) Protect Your Skin

Wear the appropriate personal protective equipment (PPE) when working with hazardous material. Supervisors (administrators, faculty, staff, etc.) **must enforce** the use of appropriate eye protection and other protective gear such as protective aprons, lab coats, face shields, closed-toe shoes, gloves etc. whenever hazardous materials/chemicals are handled.

Closed-toe shoes are required in all Chemistry classes at all times, and also in all non-chemistry classes whenever hazardous chemicals are used. Chemistry classes also require the use of aprons or lab coats whenever hazardous chemicals are used.

CNSM personnel photographed or recorded working in CNSM laboratories or other areas must be in full compliance with all PPE and other college safety policies relevant to the work being done even if the work is "staged" and no actual hazards are present. Publicly accessible images must satisfy the perception that the appropriate safety measures are in use. CNSM Science Safety recommends that planners, organizers, and photographers consult with the CNSM Science Safety Office prior to planned shoots/recordings to ensure safety and CNSM policies are properly represented.

C. Work Near a Safety Shower/Eyewash

Anyone working with chemicals that can injure the eyes or skin must be within 10 seconds of a properly-operating eyewash station and safety deluge shower (even when wearing all the appropriate PPE). Examine the eyewash/shower prior to beginning work to ensure that it is not posted as "out of service", and check the inspection tag on the device to make sure it has been recently tested by campus plumbers.

In the event of a hazardous chemical splash to the eyes or clothing/skin, use the eyewash and/or shower for the full 15 minutes, and ignore the flood. Assisting parties or the supervisor should call x5-

HELP to request clean-up assistance, then spread "kitty litter" on the floor to minimize the slip hazard (available from the CNSM Science Safety Office and the Safety Cabinets in HSCI-385, and MLSC 300 level hallway).

D. Use Safe Laboratory Practices

When mixing two different materials, use small amounts and observe the reaction. Control reactions with an ice bath as appropriate. Change or dry gloves that are wet or slippery. Secure reaction labware and equipment properly. Employ pressure relief in labware setups.

Do not remove a container from the hood or handle it if a reaction is in progress. Never cap or stopper a reaction.

Bulk chemicals may be transferred to smaller containers, providing the new container is compatible with the material and is properly labeled. *Use plastic containers whenever possible.* See transfer of bulk chemicals, above.

E. Promptly Report All Incidents (Including "Near Misses")

Report known, suspected or potential dangers, spills, odors, chemical exposures and other health, safety and/or environmental problems to the CNSM Science Safety Office. If safe to do so, take immediate action to protect people and property.

The CNSM employee in charge of the incident area and/or effected personnel must fill out an incident report form, then forward it to CNSM Science Safety Office. Blank forms are available in safety cabinets, Department offices and from the CNSM Science Safety Office website.

Safety personnel will review the incident as appropriate. Incident reporting is very important part of the program and demonstrates that the supervisor is in full compliance with the safety policy.

F. Avoid Working Alone

A "buddy system" of some sort *must* be in place when engaging in a hazardous activity. Students who work on-campus at night are encouraged to call University Police (x54101) to obtain an escort to or from the parking lot. It is always a good idea to inform the Police of your presence after hours.

Lab-specific security policies may prohibit working in lab after regular business hours. The lab security policy should be posted at all entries to research labs.

G. Maintain Good Laboratory Housekeeping

Maintain clear aisles, don't let dirty labware accumulate, periodically defrost the refrigerator/freezer. Clean out the fume hood regularly. Students should clean up their work areas and leave the laboratory well-ordered.

Don't overfill the broken glass box. Don't stockpile empty boxes. Clean up spilled buffers and non-hazardous materials promptly, but **spills of *hazardous materials* may only be addressed following exactly the requirements presented below**.

CNSM personnel are **prohibited** to undertake dangerous chemical clean-ups. Improper technique can cause injury or death.

H. Clean/Decontaminate Your Own Equipment and Labware

Do this prior to releasing it to another person, returning it to the Issue Room, or sending it out for repair. Even "harmless" residues must be removed. Make any hazard labels on cleaned equipment illegible. Balance areas, reagent bottle exteriors and other chemical containers must be kept clean. Wipe off contamination as it occurs.

Materials contaminated with hazardous residue must be collected as hazardous waste; **never throw dangerous contaminated items into the regular trash or into the broken glass box**. Never accept equipment, labware, or containers contaminated with an unknown material.

I. Use the House Vacuum System Responsibly

Whenever there is a possibility of pulling liquid and/or hazardous material into the vacuum line, an appropriate trap/filter of some type *must* be employed. Misuse can create a health hazard and/or disable the entire system.

A simple trap employing an additional capture flask for liquids, an in-line cotton/charcoal packing for gases/particulates, or a dry ice trap for low boiling point liquids is usually appropriate. Ensure that the packing is compatible with the material being trapped. Don't let solvents evaporate into the system during any drying processes.

J. Unattended Operations

Mishaps arising from unattended experiments or processes can be very dangerous. In a heated system, loss of needed coolant due to a detached coolant hose or failed coolant circulation pump can result in solvent loss, reaction overheating, pressure build up, hazardous material release, explosion and/or fire. In systems where volatile substances can be generated, pressure release mechanisms can fail leading to a potential for explosions or release of hazardous substances. In flow systems where either inputs or outputs can become unbalanced the system can go out of control with varying potential hazards.

When preventive controls rely on external utility services, unscheduled utility outages can render these safety precautions ineffective. Such utility outages are far too common to take chances when a reaction is unattended.

Any distillation or other ongoing potentially hazardous process must be overseen by a qualified person. When unattended the qualified person must ensure that safety systems are in place that will prevent accidents and damage to persons or property.

Operations requiring power to maintain a safety feature shall be equipped with an automatic safety shut-down device if left unattended, or should be on an uninterruptible power supply. Liquid flow, liquid level, heat, pressure, and water spill sensor switches, etc., can be installed on apparatus to trigger the emergency shutdown. CNSM Science Safety Office stocks some of these devices, available for loan.

In heated systems requiring coolants, the house water system shall NOT be used to cool an unattended operation. Unattended operations must be cooled by a recirculating pump system from a reservoir holding no more than 20 liters of coolant. Cooling hoses should be synthetic, not latex, and must be secured with wire or clamps. A containment tray sufficient to contain any spills or overflow must be provided under the setup.

In addition to the above precautions, leave a light on the operation when possible, and place the appropriate unattended reaction sign on the door. Contact the CNSM Science Safety Office for guidance on system shutdown design.

34. Storage and Use Requirements According to Hazard

A. Flammable Liquids

Flammable liquids must be stored away from any oxidizers, heat source, open flame, sparks etc. and should be stored apart from other materials. Store them close to the floor when practical. As with all hazardous liquids, a tray of minimum 2 inches depth is required to provide "double containment" for spills/breakage. 100% containment capacity is even better and strongly recommended. Never store unprotected bottles on the floor, and **never store flammable liquids in a refrigerator unless it is *factory-labeled* as "Flammable Materials Storage Refrigerator" or "Explosion-Proof". *No exceptions.***

Flammable liquid should be stored inside a flammables cabinet. Storage outside of flammables cabinets is limited by fire codes. Up to 60 gallons of flammable liquids may be stored in a flammables cabinet and no greater than 10 gallons may be stored outside a flammables cabinet in any lab.

Transfer of flammable liquids (pouring or pumping from drums) is potentially hazardous. Employees may not transfer bulk (> 5 gallon container) flammable liquids until they have been specifically trained to do so by CNSM Science Safety Office. Metal containers must be grounded and bonded to prevent fires due to sparks from static electricity. Plastic containers must remain on the ground during transfer. Contact CNSM Science Safety Office for training.

B. Flammable Solids

Flammable solids must be stored away from any oxidizers, heat sources, open flames, sparks, etc.

C. Flammable/Reactive Compressed Gases

Flammable/reactive compressed gases, like all compressed gasses, must be used and stored with the cylinders securely strapped/chained. These gases are even more dangerous than flammable liquids. Exercise the utmost caution with flammable gases such as hydrogen, acetylene and liquefied hydrocarbon gases. Carbon monoxide is flammable and toxic.

Reactive gases include oxygen, chlorine and nitrous oxide. A general rule of thumb, based upon regulations, is to limit the number of full-size flammable/reactive cylinders to 3 PER ROOM in any lab. Flammable gases (fuels) must be separated from oxidizers (e.g., oxygen) by a minimum of 20 feet, or be separated by a suitable barrier that meets CGA standards. Contact CNSM Science Safety Office for details.

D. Corrosive Liquids

Corrosive liquids include both *acids and bases*. Separate acids and bases and other incompatible combinations; for example, NEVER store organic acids such as acetic acid next to strongly oxidizing mineral acids such as nitric or perchloric acids. If perchloric acid is used in the laboratory, be especially careful that this powerful oxidizer does not inadvertently come into contact with incompatible materials. Such contact has resulted in severe explosions. Perchloric acid should be carefully segregated into its own containment trays. Other perchloric acid requirements apply. Contact CNSM Science Safety Office for details.

Corrosive liquids must be stored in a containment tray and should be stored close to the floor when possible. A common storage place is a properly labeled cabinet under a fume hood. Corrosive materials often degrade their containers and therefore the **integrity of the container, label and cap/lid must be**

checked often. Vapors from closed bottles of corrosive materials may react with other substances and/or attack metals to cause erosion and structural deterioration.

Do not store corrosives in a metal cabinet. Acids in contact with metals produce extremely flammable hydrogen gas, and bases in contact with aluminum have also been known to liberate hydrogen. Avoid storing corrosives within laboratory cabinets containing gas pipes, water pipes, or electric conduit since accidents have resulted from the corrosive action on pipes. The blue corrosive cabinets in MLSC may only be used for acid *OR* base, never both. CNSM Science Safety Office offers free Acid and Base Cabinet Labels.

Never add water directly to concentrated acid; add the acid to the water. "Do what you otter, add acid to water."

E. Metals and Metal Compounds

Metals and metal compounds are often *poisonous*; effects vary and depend greatly upon the physical and chemical state of the metal or compound. Exposure to some metals/metal compounds can produce rapid death, injury and/or chronic illness. Many are extremely flammable when in fine particulate form or when in contact with other materials. Beryllium use is prohibited without specific Safety approval.

Uranium and Thorium require Radiation Safety authorization.

1) Alkali Metals (Li, Na, K, Rb, Cs)

Special use and storage requirements apply to alkali metals and alkoxides due to their extreme flammability, violent reactions with water, and potential for production of corrosive fumes/byproducts. Follow the latest guidelines from the supplier and safety references. Some older published methods are no longer considered safe.

2) Mercury Metal and Mercury Compounds

Metallic mercury evaporates slowly at room temperature and is capable of producing toxic/lethal concentrations when heated following a release. Use unbreakable containers and always employ double-containment pans under manometers, etc. Minimize the use of mercury-containing equipment when possible, e.g., use electronic or red spirit thermometers instead of mercury thermometers. The use of mercury thermometers in instructional labs is not permitted.

Organic mercury compounds are exceptionally dangerous; one drop of dimethyl mercury can deliver a lethal dose even through a latex glove. You must contact the CNSM Science Safety Office for guidance and specific approval prior to acquisition or use of organic mercury compounds.

Spilled mercury must be cleaned up promptly. CNSM Science Safety Office and/or EH&S are the only personnel authorized to clean up mercury spills. Contact CNSM Science Safety Office (562.985.5623) or EH&S (562.985.2283) in the event of a spill. Do not attempt to clean up yourself. Special kits and equipment must be used by trained individuals.

CNSM Science Safety Office can provide assistance with cleaning any mercury-contaminated hot plates, heating mantles, ovens, and other heating equipment before using. After decontaminating a heating device, make sure the first use occurs in a fume hood. Call CNSM Science Safety Office to arrange for a mercury vapor survey if exposure or residual contamination is suspected.

F. Oxidizers

Oxidizers with few exceptions, shall be stored separately in a cool place, away from flammable/combustible materials such as organic compounds or powdered metals. **Hydrogen peroxide at >8% may NOT be stored in areas (including refrigerators) where flammable/combustible chemicals are stored.**

G. Water-Reactive or Air-Reactive materials

Water- or air-reactive materials must be stored and/or used in areas remote from air, oxygen, water etc. as appropriate. Storage under kerosene, oil or nitrogen may be required. Handle reactives in a properly working glove box following the manufacturer's instructions for the special packaging used. Specific training in the use of these materials and equipment should be documented by supervising faculty/staff.

Pyrophoric materials (e.g., extremely air-reactive flammables like pure butyl lithium) **are prohibited** in CNSM except by very specific case-by-case basis following approval by CNSM Science Safety Office, the Chemistry Department Safety Committee and campus EHS approval.

These and other materials may be stored in the metal cans in which they were shipped as long as the container remains in good condition without signs of corrosions and is properly labeled for the contents and hazards. Storage containers showing signs of corrosion must be discarded or replaced.

H. Extremely Hazardous Compounds

Extremely hazardous compounds such as cyanides and diisopropylfluorophoshate must be securely stored as to prevent accidents, theft and unauthorized handling. Confine small cylinders of toxic gases in a fume hood (i.e., carbon monoxide, fluorine, chlorine, nitric oxide etc.). Any material that has an LD50 of <50 mg per kg (oral rat) is considered extremely hazardous.

I. DEA Regulated "Drugs"

DEA (Drug Enforcement Agency) Regulated "Drugs" may not be possessed, used or acquired without a current Federal permit, e.g., barbital, testosterone, ketamine, chloral hydrate, etc. Certain drug precursor chemicals are also restricted; contact the CNSM Science Safety Office for details.

35. Safety Control Measures for Particularly Hazardous Substances

Particularly hazardous or highly regulated substances such as radioactive materials, regulated drugs, poison gas, explosives, pyrophorics, select carcinogens (see below), dimethyl mercury, HF (hydrofluoric acid), human unfixed tissues/blood/ blood products etc. **MAY NOT BE USED OR POSSESSED** until approval by the CNSM Science Safety Office and/or Radiation Safety Office has been granted and the appropriate safety measures have been implemented.

36. Control of Inhalation Hazards – Vapors, Fumes, Smoke, Dusts, Microbes

Chemical inhalation exposures must be kept below current "Threshold Limit Values" or "Permissible Exposure Limits" and "Short Term Exposure Levels" (TLV or PEL and STEL, respectively) accepted by Cal/OSHA. Contact the CNSM Science Safety Office for a workplace survey if you think your work may create excessive exposure levels. Exposure minimization is achieved via the following.

A. Fume hoods and Biosafety Cabinets

Use chemical fume hoods when an operation may generate bad odors or airborne exposures above Cal/OSHA permitted levels. To ensure worker protection, the fume hood airflow must average 100 linear feet per minute (lfm) through the hood opening; the use of carcinogens may require 150 lfm. The hood sash must remain at or below the sash stop arrow line to maintain adequate face velocity. In order to ensure proper airflow, keep all items in the hood at least six inches away from the front of the sash and separated from each other by at least one inch, and keep all laboratory doors and windows shut.

1) Hood Performance

Check hood performance before and during use by **observing the airflow indicator** (electronic indicator or Vane-O-Meter® must be present and operational). When equipped with an alarm test button and/or emergency purge button those features too must be checked.

Do not use a hood for protection from airborne exposures if the airflow has been compromised or the alarm and purge functions are bad. If you have reason to believe you have been or are being exposed to unsafe levels of airborne contaminants, you should **stop working immediately** and request a quantitative survey.

Hoods that are not properly functioning must be posted with a warning sign. Check the "Fume Hood Survey" sticker near the hood face to confirm that a performance check has been done within the past year (or within the past 6 months for carcinogen hoods). Do not use an "outdated" hood for a dangerous operation.

Report unchecked hoods and defective or suspected defective operation to the CNSM Science Safety Office. Call CNSM Science Safety Office to request a resurvey to confirm adequate air flow in hoods if a problem is suspected.

Some toxic materials are commonly stored in the fume hood to provide continuous ventilation. Keep stored materials to a minimum; excess storage clutter reduces the efficiency of the hood. Almost any large item in a hood, especially if positioned near the front, will create a "dead spot" rendering the airflow inadequate.

Do not use the hood to intentionally dispose of hazardous materials via evaporation. Call the CNSM Science Safety Office for details.

Do not rely solely on the hood sash for protection from splash or flying particles. The appropriate goggles are still required when working in the hood with chemicals/materials that could injure the eyes. Consult the detailed Chemical Fume Hood use policy (PDF) on the CNSM Science Safety Office website at for more information.

2) Biosafety Cabinets (Biohoods)

Biosafety cabinets (biohoods) can provide a work area free from ambient microbial contamination. CDC/NIH Guidelines require that Biohoods used at biosafety level 2 (BSL2) must have been tested and certified (passed a performance check) within the past 12 months. Individuals that will be working with BSL-2 infectious materials in any way that may generate aerosols (such as liquid transfers, pipetting, mixing, etc.) must do so inside of a certified biosafety cabinet.

Work at BSL3 is currently not permitted at CSULB. Working with or storage of large volumes of flammable or hazardous materials inside biosafety cabinets is not permitted.

B. Personal Respirators

Even though many SDS's suggest that you use a respirator (dust mask, gas mask and/or air supply device) to protect yourself from an inhalation hazard, these devices are prohibited at CSULB except by a small group of highly trained and medically approved safety professionals.

Everyone else must control exposures to inhalation hazards by using the proper engineering controls such as fume hood or biological hood. Only in the event that exposure levels cannot be maintained below permissible exposure limits through the use of a hood or other means, the use of respiratory protective equipment by staff or faculty will be considered.

EH&S manages the campus respirator program, and only respirators provided by them may be used. Disposable "one-strap" dust masks are not regulated and may be worn in non-hazardous areas to filter "nuisance level" dusts.

37. Clean-Up of Hazardous Chemical Spills

Only properly trained and equipped personnel may attempt to clean up hazardous spills.

Whenever there is a question regarding safe cleanup, contact CNSM Science Safety Office and/or EH&S. Airborne surveys may be required prior to cleanup to establish respirator needs. It is each chemical user's responsibility to ensure that emergency response personnel are contacted as needed, spills are completely and promptly cleaned-up in a proper and responsible manner, and all pertinent information is relayed to any spill response personnel.

The limitations of available PPE and emergency equipment must be thoroughly understood by potential users. Never jeopardize your health or the health/safety of others in a spill situation.

1. **If it is extremely hazardous, a major spill, or you don't know what it is, WARN PEOPLE AND GET OUT.** Tell everyone who may be in danger that there is a spill; direct them to leave the danger zone. Shut the door. Call 911 or pull the building "fire/evacuation" alarm if necessary.
2. Call CNSM Science Safety Office x55623 (MIC-207) and/or the Chemistry Issue Room (MLSC-305) x54868 and/or Environmental Health and Safety x52283 to report the spill. Request assistance as needed.
3. Identify the spilled chemical if safe to do so. If you don't know its hazards (flammable, corrosive, poison etc), **FIND OUT NOW**. Ask someone who works with the chemical, or Issue Room/Safety people and/or read the SDS BEFORE proceeding.

4. Spill cleanup for small or non-hazardous spills: If it is safe to remain in the room, the spill is smaller than a few milliliters, is non-hazardous, and you are capable of safely cleaning it up yourself, proceed as follows:
    1) Stop the flow of the spill with absorbent material. Use paper towels, lab coats, kitty litter or absorbent pillows. Do not use paper or cloth on an oxidizer spill.
    2) If spilled material is flammable, extinguish all flames and heat sources and keep sparks away. Do NOT use steel or iron tools (dustpan, shovel, bucket etc.) with or near flammables. They can cause sparks when scraped on many surfaces. Do not use an electric fan to help dry out the spill.
    3) Keep people away from the spill; use barrier tape etc. as needed.
    4) Put on fully enclosed chemical splash goggles.
    5) Put on two pairs of gloves; check glove chart to be sure of protection from the chemical.
    6) Carefully put soaked material into a compatible bag/container that can be well sealed.
    7) Put the closed container in a hood. Label it with a yellow "Hazardous Waste Label".
    8) Decontaminate surfaces/tools promptly. Use an appropriate cleaning agent.
5. Gloves, glove chart, kitty litter, clean-up guide, goggles, bags, labels etc. are in the Safety Cabinets located in HSCI 385 and MLSC 300 level near the elevator. HSCI 385 is unlocked and any MLSC building key will open the locked cabinet.
6. Start an **Incident Report form** (get from the CNSM Science Safety Office, Department office/Safety Cabinet) and take it to the CNSM Science Safety Office.

38. Hazardous Waste Disposal and Environmental Protection

Everyone within the College shares the responsibility for safe, legal and environmentally sound disposal of hazardous wastes. Hazardous waste includes used oils, paints, animal preservatives, glues, solvents, batteries, office chemicals etc. as well as the more familiar laboratory chemicals. Hazardous material may NOT be poured down the drain. Disposal of waste by evaporation in the fume hood is prohibited.

Check your waste staging areas frequently to ensure that containers are kept closed, are in good condition, are fully labeled, and less than six months old. EH&S makes weekly pickups. Call CNSM Science Safety Office to request a pick up. Contact the CNSM Science Safety Office for guidance in the collection and disposal of hazardous waste and surplus chemicals.

Please note that Cal/EPA inspections are conducted regularly. If a waste violation is found, your department must pay the fine. Grant chargeback is likely.

- All hazardous waste must be labeled with a standard yellow CNSM Hazardous Waste Label as soon as ANY waste is collected.
- Always close the bottle when not immediately adding waste.
- **Never write the word "WASTE" (or "waste oil" etc.) on any container.**

- Never allow a waste bottle to stay in service more than **6 months**. Call CNSM Science Safety Office for disposal if you have a waste container approaching this limit.

Each yellow Hazardous Waste Label must be properly filled out; do not forget that the "Start Date" is the day the first drop goes in the bottle, or the day the material is declared to be "waste". Labels are available in Department offices, Issue Rooms Safety Cabinets and the CNSM Science Safety Office.

Every effort should be made to identify the contents of any unlabeled waste; identification of waste chemicals by outside contractors (even if it proves to be detergent) is expensive. Do not move an unlabeled container; call CNSM Science Safety Office and they will investigate. The location provides important clues as to its identity.

"Empty" containers formerly holding ordinary hazardous materials typically must be "TRIPLE RINSED" and the label defaced or marked EMPTY prior to disposal via public trash. Containers that held extremely hazardous material may require different procedures for disposal; consult the CNSM Science Safety Office if in doubt.

Rinseate

Empty containers that are being rinsed should be triple rinsed with a minimal amount of liquid and the rinseate collected and managed as hazardous waste. Subsequent rinses may be discharged to the sewer. Depending on the waste, fewer rinses may be required to be collected.

39. Minimization of Hazardous Waste

Minimization through chemical sharing is encouraged; if you are about to order a chemical, ask CNSM Science Safety Office to search for it on the campus Hazardous Materials Inventory as it may be on-campus and available to you free of charge.

All Faculty and Staff are required to participate in the campus wide Hazardous Materials Inventory Program. This spreadsheet data is forwarded via CNSM Science Safety Office to the campus EH&S Office. Individual chemical inventories must be examined periodically to identify surplus materials. Faculty and staff are expected to obtain chemicals in quantities that will be used within a reasonable period of time.

40. Working With Needles

You must consistently observe the following **Safe Work Practices** to reduce the likelihood of chemical or biohazardous materials exposure and/or injury from needles:

- Needles shall NEVER be bent or broken prior to disposal. Needle cutting devices may not be used.
- Needles must NEVER be recapped unless no other alternative is feasible. Reusable needles may only be recapped using mechanical means or a one-handed recapping process, meaning that you cannot hold the cap while recapping. Instead of recapping, store the needle/syringe in a tray or rack.
- Single-use needles/sharps shall be discarded immediately after use into an approved Sharps Container obtained from CNSM Science Safety. Never throw needles into a trash can. Lancets

used to obtain a blood sample may only be of single use type whereby upon use, the piercing implement automatically retracts and is not accessible or removable.

- Do not overfill the sharps containers. Contact CNSM Science Safety when 2/3 full.
- Consult the detailed Needle Handling Policy on the CNSM website for more information.

41. Biohazardous Agents (CNSM Biohazard Control Program)

The CNSM Biohazard Control Program is based on the California Health and Safety Code Sections 117600-118360 and the CDC/NIH Guidelines for Biosafety in Microbiological and Biomedical Laboratories 6th edition (2020). The guidelines indicate the Biosafety Level (BSL) for each microbial agent; the levels range from 1-4. The Biosafety Level dictates the method of disposal, use of certain lab practices, containment techniques, safety equipment and facilities.

1. Agents handled at BSL-1 normally do not cause disease in healthy humans (e.g., Penicillium).
2. Agents handled at BSL-2 are associated with human disease (e.g., Cryptococcus neoformans, Shigella, human body fluids, etc.).
3. Agents handled at BSL-3 may cause serious or possibly lethal disease, with a potential for aerosol transmission (e.g., HIV, yellow fever virus, etc.).
4. Agents handled at BSL-4 pose a high risk of aerosol transmitted laboratory infections and life-threatening disease (e.g., Ebola virus).

The biosafety level required is based on the risk group into which the agent is assigned and how it will be handled. Please note that acquisition and use of biohazardous agents in the CNSM requires written approval by the CNSM Biosafety Officer.

The CNSM has BSL-1 and BSL-2 laboratory facilities only. CNSM lacks the facility engineering controls required to operate a BSL-3 laboratory. CDC/NIH Guidelines: Biosafety in Microbiological and Biomedical Laboratories (BMBL) are available for review in the CNSM Science Safety Office (MIC-207) and are available online.

The purpose of the CDC/NIH Guidelines is to protect students, employees and the general public from exposure to biohazardous materials. If you work with biohazardous materials, you should ensure that everyone in your program is trained and that the CDC/NIH Guidelines will be observed as appropriate.

Safe Work Practices

The safe work practices listed below (sometimes referred to as administrative controls) must be consistently followed to reduce the likelihood of exposure when using biohazardous agents:

- No eating, drinking, storage of food or beverages or applying cosmetics in the lab. Avoid hand to face contact.
- Long hair is restrained so that it cannot contact hands, specimens, containers or equipment.
- Don't use sharp items (Pasteur pipets, slides, capillary tubes, broken glass, etc.) unless you must. Handle all sharps carefully. See CNSM Needle Handling Policy for more information.

- Use engineered sharps protection (needle w/protective device attached) when drawing human blood.
- Immediately dispose of sharp items in rigid, leak-proof, closeable containers specifically labeled for biohazards if the sharps are biohazardous, contaminated with human blood or blood products, or were used in research involving the treatment or immunization of human beings or animals suspected of carrying infectious agents. Contact the CNSM Science Safety Office (x55623) to obtain free sharps containers or to arrange for container disposal.
- Sharps containers used for the collection of biohazards must be secured or kept in secondary containment that prevents tipping.
- Never bend, break, or shear needles. Never recap needles contaminated with biohazards.
- Wash hands after handling biohazardous materials, even when gloves were worn. Wash hands again before leaving lab.
- Always use mechanical pipetting, never mouth pipette.
- Use procedures that minimize formation of splashes and aerosols. Conduct all procedures that may produce infectious aerosols inside a certified biosafety cabinet (BSC).
- Develop and use a method of decontamination based on surfaces and type of contamination e.g., wipe benchtops down before and after use with a fresh 5-10% solution of bleach. Also decontaminate surfaces whenever contamination occurs or is suspected to have occurred.
- Each lab using biohazards, recombinant materials or other biological agents must prepare a laboratory-specific biosafety manual. Contact CNSM Science Safety Office for assistance with getting one put together, many templates are available.
- Employ **Universal Precautions**: treat all human body fluids as infectious for HIV (see "Special Biohazards" below for more information).

Engineering Controls

Engineering controls must be used whenever appropriate; examples include BSCs, sealed centrifuge rotor caps, mechanical barriers, sharps containers, engineered sharps protection on needles, etc. If a BSC is required per the CDC/NIH guidelines, it must be certified according to OSHA's Title 8, CCR 5154.1(a).

Personal Protective Equipment

Ensure that everyone concerned uses personal protective equipment (PPE) when needed to shield skin, clothing and mucous membranes from contact with infectious materials. The PPE (including eye protection) must be appropriate and fit properly; consider:

- types of fluid or tissue involved.
- potential exposure volume.
- probable route of exposure e.g., eyes via splash; if the potential for a splash to the eye exists, properly fitting and fully enclosed, indirect vented chemical splash goggles must be worn.
- working conditions e.g., aerosol production will require BSC use.

Biohazardous Waste

Solid biohazardous waste produced in a teaching or research lab cannot legally be treated and disposed of as regular trash on the premises. The waste shall be placed in a leak-proof container that is double-lined with red biohazard bags. CNSM Science Safety Office will provide the container and bags. Contact the CNSM Science Safety Office for the appropriate container and for the disposal of liquid biohazardous waste.

Biohazardous waste, as defined in the California Health and Safety Code section 117625 is:

> Laboratory waste, including, but not limited to, the following:
>
> **Cultures and stocks of *infectious agents* from research laboratories.** Wastes from the production of bacteria, viruses, spores… and [contaminated] culture dishes and devices used to transfer, inoculate, and mix cultures.

These regulations define "Infectious agents" to include any microorganism, bacteria, mold, parasite, or virus, including, but not limited to, organisms managed as BSL-2, 3 or 4. The Chief of the Medical Waste Management Program at the California Department of Public Health has concurred with this definition. Some of the cultures we work with in microbiology, mycology, molecular biology, biochemistry and research labs are at BSL-2 level.

Remember, NEVER put sharps in trash bags of any kind; always use rigid containers such as the sharps containers provided free of charge by the CNSM Science Safety Office.

Housekeeping

Housekeeping is another important issue for biohazard areas - keep your area clean. OSHA's general sanitation laws in Title 8, section 3362, state that the workplace must be clean and sanitary, and be in a condition not liable to give rise to harmful exposure. Know where your lab's cleaning and disinfecting chemicals are and use them when necessary. Also, make sure corridors and eyewash/shower units are not blocked.

Special Biohazards

A. Medical Waste

If you or those you supervise immunize animals or work with human tissues or human blood-derived products, you produce medical waste. If you perform research pertaining to the diagnosis, treatment or immunization of humans or animals, you are probably producing Medical Waste.

Solid medical waste may NOT be autoclaved and/or disposed of on campus property. The regulations for the collection and disposal of medical waste are quite stringent; improper handling could result in serious fines from the City of Long Beach.

Please call the Safety Office immediately if you think you might have medical waste. We will set up your program for you, and supply you with all the necessary information and free medical waste bags, collection containers, etc. We will also coordinate the waste pick-up and disposal for you.

B. Bloodborne Pathogens

If you or those you supervise (including students) work with any human tissue or fluid - except urine, saliva or cheek cells - your work is regulated by the Cal/OSHA Bloodborne Pathogen Standard. Improper handling could result in serious fines from the city of Long Beach.

Please call the Science Safety Office immediately if you think your work might fall under the Bloodborne Pathogen Standard.

C. Recombinant DNA

You must obtain approval from the Institutional Biosafety Committee for projects involving recombinant DNA. Please submit a Recombinant DNA Application available at Biosafety - Office of Research and Sponsored Programs.

D. Imported Samples/Specimens

All imported soils must be handled carefully and autoclaved prior to disposal. A USDA permit is required to import soils. Imported animal specimens fall under a variety of regulations. A Biological Materials Transfer form may be required.

Call CNSM Science Safety Office for guidance early in the planning stages.

42. Carcinogens

While chemical exposures are always kept to a minimum, efforts must be made to determine whether chemicals to be used in any project have carcinogenic properties. One must review the professional literature, manufacturer or vendor data, container labels, publications by health and safety agencies, and utilizing knowledge gained through professional experience.

The materials included on the official Cal/OSHA regulated carcinogen list appear below. Note that many powerful carcinogens are not listed. No one may procure or work with any of the materials below without the express permission of the CNSM Science Safety Office.

Cal/OSHA Regulated Carcinogens

Possession and use of these are restricted. Please report the discovery or planned acquisition of any of the materials listed below to the CNSM Science Safety Office. Many of these materials have several synonyms; it is your responsibility to contact the CNSM Science Safety Office if you are unsure as to whether a certain chemical is one of those below. Materials with an asterisk (*) are the "listed" Cal/OSHA Regulated Carcinogens.

For more information, see the CNSM Chemical Hygiene Plan, the CNSM Policy for the Use of Cal/OSHA Regulated Carcinogens in the Academic Laboratory, the CNSM Policy for the Use of Formaldehyde in Anatomy Laboratories, and the CNSM Methylene Chloride Exposure Control Plan.

- Methylenedianiline
- Methylene chloride
- Beryllium
- Cadmium
- Inorganic arsenic
- Lead
- Benzene
- Ethylene Oxide

- 1,2-Dibromo-3-Chloropropane
- 2-Acetylaminofluorene*
- Benzidine (and it's salts)*
- 4-Dimethylaminoazobenzene*
- Beta-Naphthylamine*
- N-Nitrosodimethylamine*
- Bis-Chloromethyl ether*
- Ethyleneimine*
- Vinyl chloride
- Crystalline silica
- 1,3-Butadiene
- Chromium VI ("hexavalent" chromium)
- Asbestos
- Coke oven emissions
- Acrylonitrile
- 4,4'-Methylenebis (2-chloroaniline)
- Formaldehyde/formalin
- Ethylene dibromide
- 4-Aminodiphenyl*
- 3,3'-Dichlorobenzidine (and it's salts)*
- Alpha-Naphthylamine*
- 4-Nitrobiphenyl*
- Methyl chloromethyl ether*
- Beta-Propiolactone*

43. Compressed Gases, Liquid Nitrogen (LN_2), and Dry Ice

CNSM maintains stocks of these materials for Faculty and Staff use. A chargeback system is in place with forms available on CNSM Forms and Documents.

Only those who have completed the "Compressed gases and LN2 training" class may move cylinders, hook-up regulators or draw LN2 from a storage tank. These training sessions are composed of online and hands-on components. The compressed gas online module is available on the CNSM Science Safety Office website.

The hands-on component usually runs the first Wednesday of the month at 1:00 PM. Contact CNSM Science Safety Office if you need to attend a session.

Some key safety requirements are as follows.

A. Identification

Identify the gas according to the manufacturer's label, not the cylinder color. Color coding is not standardized and varies greatly. Be aware that lecture bottles (very small gas cylinders) often contain extremely hazardous materials such as chlorine, hydrogen chloride, methyl bromide, etc.

B. Storage

Empty cylinders should be labeled "empty" and stored separate from full units. ***Promptly*** **return empties to the gas facility. Others need these cylinders refilled and in service.** Do not leave a regulator pressurized when the gas is off. When the cylinder is not in frequent use, remove the regulator and protect the cylinder valve by screwing on the steel safety cap. All cylinders must be effectively secured

from falling and/or rolling. Liquid nitrogen or dry ice may NEVER be placed or stored, even for a very short time, in a tightly closed container; it must constantly vent or the container will explode.

C. Handling

Always move cylinders using dollies or carts designed for that purpose. The cylinder valve cap must be in place and the cylinder must be secured to the cart. Safety glasses, gloves and safety shoes or other ANSI rated foot protection should be worn when handling cylinders. Foot protection is available in the CNSM gas bunker.

D. Usage

Know the SDS information related to your specific gas. Before removing the valve protection cap, gas cylinders must be properly secured by using a floor stand, wall bracket or bench bracket. Inspect the cylinder valve for damaged threads, dirt, oil or grease. Remove any dust or dirt with a clean cloth. If oil or grease is present on the valve of a cylinder which contains oxygen or another reactive gas, do NOT attempt to use it; a deadly explosion could result.

NEVER apply lubricant to any part of the regulator, regulator threads or cylinder valves. Never fabricate special adapters for cylinder, regulator or equipment connections that will defeat the engineered-in compatibility feature designed by the Compressed Gas Association (CGA). Never use a defective or corroded valve or regulator.

Additional compressed gas/cryogenic safety information is available from the CNSM Science Safety Office.

E. Liquid Nitrogen/Dry Ice

Adequate personal protective equipment (cryo gloves, covered arms and legs, chemical splash goggles and face shield) must be worn when using dry ice or liquid nitrogen.

44. Equipment Safety

A wide variety of specialized equipment is used in the college; many presenting mechanical, electrical chemical, physical and/or radiation hazards. The equipment is required to have built-in safeguards to prevent injuries, but these provisions alone are no substitute for a knowledgeable operator following the equipment manufacturer's instructions.

A faculty or staff person is responsible for every equipment item in the college. Employees with this oversight responsibility shall institute an effective set of controls to ensure that all who operate a potentially hazardous piece of equipment are adequately trained and supervised. CNSM Science Safety Office will gladly work with equipment supervisors to make sure the safeguards are in place.

With the help of the CNSM Shop and our Facilities Coordinator door locks and equipment power lockout security measures can be upgraded. The CNSM Science Safety Office can provide training sheets to document your training. We can also provide use-logs to document who uses the equipment.

45. Radioactive Materials, X-Ray Emitters, and Electron Microscopes

Radioactive materials, equipment containing radioactive materials (e.g., scintillation counters, gas chromatographs, etc.) and x-ray emitting equipment require special storage, handling, and use as described in the CSULB Radiation Safety Manual. No radioactive materials, equipment containing radioactive materials, or x-ray emitting equipment may be procured, used, stored or transported without prior approval from the Campus Radiation Safety Office (x55623).

Radioactive materials are usually labeled with a yellow sticker which usually says "Caution" in magenta letters, and has a magenta "propeller" symbol. Unless you have been fully trained and authorized in the use and handling of radioactive materials, you may not touch any item or radioactive materials work area (usually bordered by yellow tape) labeled with this sticker.

Principle Users of Electron Microscopes (EM) must ensure that anyone under their supervision who intends to use an EM is trained according to the current policy set forth by CSULB Radiation Safety. Signatures must be obtained to document proof of training. Contact CNSM Radiation Safety for more details.

46. Lasers

No one may operate a Class 3B or 4 laser, or be present in a laser's "Nominal Hazard Zone" (NHZ, area within which they could be injured by a hazardous beam or its reflection) without wearing properly-rated goggles as appropriate, and having first received documented CNSM Laser Safety Training.

This training consists of reading and understanding the CNSM Laser Safety Manual (available online), and reading, the "Laser Institute of America Laser Safety Guide" (available from Safety Office), viewing the "Laser Safety Micro-course" (online) and then taking the CNSM Laser Safety Quiz. This training shall be documented. Device-specific documented training will be provided by the laser supervisor or principal investigator. Contact the Campus Radiation Safety Office (x55623) for training materials.

47. Animals

A. Use in Research

Projects involving live vertebrate animals and cephalopod mollusks (including observation, classroom or research) may not commence until they have been approved by the CSULB Institutional Animal Care and Use Committee.

See Policy on Purchasing Live Animals – Office of Research and Economic Development for more information. Contact CNSM Science Safety Office for Details.

B. Service Animals

Service animals are defined by the Americans with Disabilities Act (ADA) as "individually trained to do work or perform tasks for people with disabilities" and are accommodated in consultation with faculty, BMAC, and CNSM Science Safety Office to evaluate the hazards and advise on appropriate safety precautions. The animal must be under the direct control of the handler at all times, leashed or

harnessed, and the animal cannot be strapped or leashed to lab furniture or a portion of the facility. Contact CNSM Science Safety Office for additional information.

Appendix

The following pages contain:

I. List of Some Key Safety Policies

II. Safety Instruction and Verification Form for Lab Classes

NOTE: In addition to the supplemental reading material listed in this Manual, the CNSM Science Safety Office maintains a wide variety of other chemical, health, safety, environmental, and regulatory reference materials as well as an inventory of Safety Data Sheets.

List of Some Key Safety Policies

Note those that apply to your work and make sure your program is in full compliance. Most are available from the CNSM website.

Find your topic:

Safety-Regulated Issue	Safety Policy
Access to Labs and Hazardous Areas	See door label near keyhole. Specific training is required for unescorted entry into many areas. Lab security regulations in effect and posted at laboratory doors.
Accidents, Incidents, Near Misses	An Incident Report is required. See workplace safety posters for post-injury instructions. Dial 911 for help (from campus phone for shortest response time).
Airborne Contamination Surveys	Contact the Safety Office for evaluation/measurement of levels if you think you're overexposed.
Animals, Use in Projects[1,2]	Specific approval required for all live vertebrates. The Campus has an oversight committee.
Attire, Lab	No open toe footwear in most labs. Lab coat, gloves, and apron must be used as appropriate.
Autoclaves[1,2]	Specific training/authorization is required. Autoclaving and disposal of Biohazardous waste is restricted.
Benzene	Regulated carcinogen -- report possession/use to Science Safety Office. Use a substitute where possible.
Bicycles	Not allowed in buildings. Chain ONLY to racks - NOT to railings, etc.
Biosafety, Blood, Human Blood Etc.[1]	Specific training required for use of human blood/blood products
Boxes, Empty	Do Not accumulate boxes - 5 max unless you have Safety OK
Boat Safety[1,2]	Motorized boating is highly regulated via boat safety program. Specific training/approval is required
Carcinogens	Safety approvals required for CAL/OSHA listed materials - See Safety Manual for list.
Cart, Electric[2]	Defensive Driver certification required. Employee/Formal Volunteers ONLY may operate cart.
Centrifuge Safety	Inspect/downgrade maximum rotor RPM per manufacturer's specifications. Supervising faculty/staff provide training.
Chemical Compatability Chart[1]	CNSM has a chart posted at and in Safety Cabinets. Know what cannot be mixed.
Children In Buildings[1]	Minor children are never allowed in labs or unsupervised in offices.

Safety-Regulated Issue	Safety Policy
Chromic Acid Glassware Wash Policy	Don't use for glassware wash without Science Safety Office approval. Listed as a CAL/OSHA carcinogen.
Cold Rooms	Light required to be ON when inside. Report any defective light or other problems.
Construction/Modification of Room	Any change to building walls, partitions, cabinets, awnings etc. requires University approval
Corrosive Material/Acids & Bases	Always carry in a bucket. Use with eyewash/shower 10 seconds max. away and goggles.
Cyanide Use[1]	Keep it locked away when not required
Cyrogenic Materials & Dry Ice Handling[1]	CNSM Science Safety Office trains those who acquire these materials
Defrosting Freezers	Do as needed, but catch the water. Water on floors will leak to floors below
Discipline[1]	A progressive disciplinary policy fosters workplace safety and is required by law.
Dogs And Other Pets	Not allowed in buildings (except guide animals or DSS approved ESAs)
Donations To CNSM/CSULB	Accepting equipment, supplies, chems requires formal chair/dean/Safety OK. Specific forms are required.
Drugs, Used in Teaching/Research[1]	Annual Federal DEA permit required. Possession without valid permit is illegal.
Sink Traps, Dry (Drain Pipes)	Keep water in them to stop entry of sewer odors. Most common odor complaint source.
Earthquake/Seismic Safety[1]	Cabinets >6' high must be bolted. Chemical shelves require containment (lips, cables etc.).
Electrical Panels[1]	Keep clear for 36" in front - including floor. 30" side to side also required.
Electrical Safety[1]	Use of extension cords is restricted. Never Plug power strips together. Use 3-wire cords when necessary and do not defeat ground with adapter.
Emergency 911 Calls	Call, then send someone to meet responders. Cell Phone 911 gets the Highway Patrol
Emergency Phone System	Located in elevators, hallways & across campus. Direct line to police. Campus Police (562) 985-4101 (add to your cell)
Ergonomics (Safe Lifting, Sitting And Working)	Workplace assessment available through EH&S. Arrange through CNSM Science Safety Office
Ethers and Peroxide Forming Chems[1]	Ethers, THF, Dioxane must be DATED when open & discarded in 1 yr. or tested. Peroxide explosions kill

Safety-Regulated Issue	Safety Policy
Evacuation, Emergency Exit	Shutdown equipment, close doors, take personal items, and get out
Experiments, Unattended	Auto shutdown and posting required if unattended more than 2 hrs. Safety has equipment.
Extremely Hazardous Material	Know if you or your students/employees use them. List available. See web.
Eye Protection[1]	Required in most labs. See safety manual and CNSM Science Safety Office website for details.
Eyewash/Deluge Shower	Must be within 10 sec. of worksite using chemicals that injure eyes.
Facility Modifications[1]	Specific SAFETY permission required to construct in or modify a room/space.
Fetal Health - Reproductive Health[1]	Know the materials you use and exposure levels. Consult with your M.D. Policy available.
Field Trips And Field Projects[1]	Special University paperwork required. See University Website & department office.
Fire Extinguishers	Use them ONLY IF SAFE to do so. Periodic training available.
First Aid Kits	Must be Science Safety Office approved, inspected/restocked regularly, and bear a FAC/Staff name.
Flammable Liquid In Frig/Freezer	No alcohol, ether, etc. allowed unless unit clearly marked by mfg. for FLAMMABLES.
Flammable Storage Cabinets	Some provided by Science Safety Office. Specific limits in and out of cabinets apply.
Flammables	Amounts, containment, storage & some use restricted. See Manual.
Food In Improper Location	Food & drink not allowed in labs and some technical work areas.
Formaldehyde/Formalin[1]	CAL/OSHA-regulated carcinogen. Requires carcinogen label. Use alternates if possible.
Fume Hood Use[1]	Used in lieu of respirators. Safety Manual and website describes use & maintenance.
Gas Cylinder Safety[2]	Training and passing a Science Safety Office exam is required to move/install them.
Glass, Broken	Never put in regular trash. Collect in a box & tape it shut for custodians or take directly to dumpster.
Gloves	Use the CORRECT glove (see chart). Don't wear gloves outside of the lab.
Guards, Belts, & Chain	Must be present on equipment to prevent access to moving parts.

Safety-Regulated Issue	Safety Policy
Hazardous Material Inventory	A specific spreadsheet format is used. (Faculty and staff must participate).
Hazardous Material Transport	Use bottle carriers on campus. No Off-campus without Science Safety Office OK.
Hazardous Waste[1]	Faculty & Staff must monitor amount and date. 6-month accumulation time.
Housekeeping	Please keep all areas tidy -- it's an OSHA requirement. Minimize stored paper.
Human Subjects[1]	Special committee review and approval required
Human Tissue Specimens[1]	See BioSafety. Bloodborne Pathogen training required. Medical Waste rules apply.
Hydrogen Fluoride - Hydrofluoric Acid[1]	Extremely dangerous material. Science Safety Office OK required.
Injury/Incident Procedures[1]	Read Department Bulletin Board posters to know what to do and where to get treatment.
Inspection Program, Safety	A Standard checklist is used. Done periodically and upon request.
Junk and Unwanted Item Policy	Do NOT place unwanted items in hall, landing, walkway. Contact dept. designee for removal.
Lab Class - Safety Instruction	Science Safety Office overview of class must be provided by instructor using std. form.
Lab Manuals - Include Safety	Make sure to include goggles, gloves, etc. Also address waste/containers
Labeling Materials[1]	Write full name AND primary hazard. See posters throughout CNSM.
Lasers[1]	Mandatory program for any Class 3b or 4 device. Science Safety Office OK required to acquire and use.
Liquid Nitrogen[1,2]	Safety training/exam required to obtain/transport from CNSM supply.
Lockout of Electrical Equipment[1]	LOCK power OFF prior to servicing equipment. Lock boxes are available.
Safety Data Sheets	Ask CNSM Science Safety Office &/or get sheet from web link. Know the hazards and communicate them.
Medical Waste[1]	Human blood etc. See "Human."
Needles, Hypodermic[1]	Never re-cap by hand, clip or bend. Needle boxes are available from Safety Office
New Employee Training	CNSM Introductory training is mandatory. Faculty/staff give job-specific training.

Safety-Regulated Issue	Safety Policy
Parking, Vip & Contractor	Special permit required to park. OK to load/unload with flashers on. Violators ticketed/towed.
Perchloric Acid[1]	Use special hood or trap emissions if evaporating. Very reactive - Forms explosives. Safety office OK required
Peroxide Forming Agents[1]	Mark date opened on cans of ethers, dioxane, THF. Peroxides explode. Discard after 1 year.
Pipetting By Mouth	Don't do it -- even with harmless liquids.
Pregnant Persons	Consult your MD for exposure concerns. Discrimination is illegal.
Radioactive Materials/X-Rays[1]	Separate Manual. Requires specific approval to get RADMAT or x-ray devices.
Rags, Soiled	If combustible, empty the metal can every day.
Recombinant DNA Use[1]	Formal committee approval required - Contact Safety.
Refrigerators/Freezers	Specific label stating contents and user info required on each one
Reproductive Health[1]	Accommodations will be made as necessary to protect people from reproductive hazards.
Research Projects, Faculty Role	Faculty must submit a standard safety review and approval form.
Respirators[1,2]	University policy. Use is prohibited unless in the formal CSULB EH&S program.
Right-To-Know, "Hazcom"	Know about chemicals you work with. Know the SDS info and communicate to others.
Room Labeling Policy	NFPA Diamond relays hazards & emergency info to Police and Fire personnel.
Safety Cabinets Mlsc-317/HSCI 385	Employees may use safety supplies stored inside. Opens with any bldg. room key.
Safety Manual, CNSM[1]	Version you got when trained may be outdated. CNSM Science Safety Office is current - visit often.
Safety Training	Required for faculty, staff, and student workers. Also for unsupervised lab students.
Scuba Diving[1,2]	Ocean Studies Institute Dive Office approval required for any CSU dive.
Sharps (Hypodermic Needles Etc.) [1]	Sharps containers and disposal provided free by the Science Safety Office.
Shop Safety/Tool Use Policy	Shop coordinator will control access/work for all CNSM personnel using shop facility.
Smoking Policy[1]	University smoke-free as of Fall 2016.
Spills, Chemical[1]	Don't endanger yourself or others - get help as needed. Follow poster guidelines.

Safety-Regulated Issue	Safety Policy
Spills, Water	Floors aren't water-tight and leak to lower rooms. Avoid spills. Mop up water IMMEDIATELY.
Student Safety	Specific lab safety info. MUST be relayed using a green form. Departments keep the forms 5 years.
Supervision - Classroom	Instructor must be IN THE ROOM for continuous oversight. Bathroom breaks excepted.
Training Opportunities, Refresher	Follow Safety e-Memos and webpage for CNSM refresher. Mandatory meetings/exams may be required.
Transport of Hazardous Materials	Clearance required for EACH faculty/staff HAZMAT transaction to/from campus.
Unattended Operations	No stills etc. running >2 hr. w/o auto shutdown. Recirculating water required. Put sign on the door warning of running operation.
Vacuum System Protection (House)	Employ an in-line trap to prevent contamination of the system.
Volunteers	Non CSULB students/employees must be formally appointed to work in CNSM. See CNSM website.
Water Reactive Materials[1]	Safety has a list. Special precautions required.
Watercraft Safety	See BOAT. Non-motorized craft require fac/staff supervision and safety too.
Working Alone	Don't do anything dangerous unless someone's nearby and can help. You have campus police number in your cell, right? 562 985-4101. Some labs prohibit after hours work.

Footnotes:

[1] A stand-alone policy and/or manual is in place that addresses specific details and requirements. If not on the CNSM Science Safety Office website, get it from the CNSM Science Safety Office.

[2] Specific Training & Exam/Skill Test required

Safety Instruction and Verification

(Student Laboratory and/or Field Work)

To the Instructor

Please read the applicable information printed on the "Instructions for Student Safety Verification Form" to your class (document available in your Department Office/Issue Room and CNSM Science Safety Office Website). **Check off each topic on this form as you discuss it with them. Write "N/A" for topics that do not apply.**

Return the completed sheet to your Dept. Office or Issue Room. It is your responsibility to describe the hazards associated with the course and the appropriate health and safety measures needed to minimize the risks posed by the hazards. This document was designed to facilitate this task.

Throughout the semester, it is your responsibility to ensure that the appropriate health and safety measures are followed. Any questions regarding this safety training and documentation and enforcement should be directed to the Department Chair, or the CNSM Science Safety Office (x55623).

To the Student

It is your responsibility to be knowledgeable in the safety-related matters associated with this course and to abide by the safety policies and procedures presented by the instructor. Part of the evaluation of your performance in this laboratory will be based upon your strict attention to these safety policies. **Failure to meet these requirements may result in expulsion.**

Instructor Name: _____ Course: _____ Section No.:_____

Part I. General Safety Matters

This entire section is required information for everyone.

___ 1. Right-to-know/Hazard Communication – Labeling containers and rooms
___ 2. Material Safety Data Sheets (SDS)
___ 3. Goggle policy for liquids, lasers, UV light, flying particles
___ 4. No eating/drinking/food and no smoking policies
___ 5. Housekeeping/clean-up
___ 6. Conduct in the laboratory or field site, no personal electronic devices may be used unless for instructional or emergency use**
___ 7. Reporting of accidents, exposures, and injuries (Instructor must turn in an *Incident Report Form* too)
___ 8. Student medical costs (no coverage!)

Part II. Safety Equipment And Procedures

Points 5 and 6 apply to everyone.

___ 1. Safety shower
___ 2. Eyewash
___ 3. Fire extinguishers
___ 4. Proper Laboratory Attire (closed-toe shoes REQUIRED AT ALL TIMES in labs that EVER use corrosive/toxic chemicals – NO sandals!)
___ 5. Emergency evacuation route (required information for everyone)
___ 6. Emergency phone procedures (required information for everyone)
___ 7. College safety supply cabinet
___ 8. Chemical and/or biological hood
___ 9. Protect house vacuum. Use a vacuum trap

Part III. Chemical and Equipment Hazards

Point 10 applies to everyone. Point 15 may apply to many.

___ 1. Chemical storage and incompatibilities
___ 2. Proper disposal of chemical wastes
___ 3. Use and handling of concentrated acid and bases
___ 4. Use and handling of toxic chemicals & exposure routes
___ 5. Use and handling of carcinogenic chemicals
___ 6. Use and handling of radioactive materials
___ 7. Use and handling of biohazards
___ 8. Use of scientific glassware
___ 9. Handling and reporting of chemical spills
___ 10. Proper disposal of broken glassware/sharps (required information for everyone)
___ 11. Use and handling of water reactive chemicals
___ 12. Use and handling of oxidizing and reducing chemicals
___ 13. Use and handling of reproductive toxins
___ 14. Use and handling of compressed and/or liquefied gas
___ 15. Equipment hazards e.g., centrifuges, Bunsen burners etc.
(list the equipment to be used on this line): _____

Part IV. Fieldwork and Travel Hazards

Additional documentation required prior to departure. See NOTE to instructors below.

NOTE: All instructors/trip leaders who conduct field trips/projects MUST follow University procedures outlined in the Faculty Resources webpage. Start by completing the "CSULB Academic Course Field Trips Checklist" found at the above website.

** *The CSULB policy states: "Disciplinary action: The University, through appropriate administrators, may take the following disciplinary actions against employees or students who violate proper safety procedures willfully or through negligence. The severity of this action will be determined by circumstances of the violation:*
(a) Oral reprimand, (b) Written reprimand placed in his/her official folder, (c) Temporary suspension, (d) Demotion (CSULB employee), (e) Dismissal or expulsion.

Signatures on Next Page

Instructor Certification

I certify that I presented the applicable safety and health information to the students of this class/lab as indicated above based upon the current CNSM *Instructions for Student Safety Verification Form*.

Print Instructor's Name: _____

Instructor Signature: _____ Date: _____

Student Certification

I hereby acknowledge that I have been instructed in and understand the applicable safety and health information, and safe use of materials, equipment and machinery as given by the instructor for this course/lab as appropriate. I realize that inappropriate behavior and/or the misuse of equipment, materials etc. can lead to serious injury. I hereby agree to follow all instructions for student safety as given by my instructor now and in the future. I hereby agree to fully comply at all times with all CNSM and University policies and procedures associated with safety as pertains to this course/lab. I hereby agree to work safely at all times, protecting both myself and those around me. I hereby agree to handle materials, equipment, machinery and other items identified by the instructor in accordance with the safety instructions provided at all times during this course/lab. I further agree that I will not operate any equipment or machinery or use any materials or other items identified as applicable by the instructor without appropriate instruction, supervision and understanding of the potential hazards involved. I understand that I am responsible for medical treatment costs if I am injured in this class/lab.

Print Name	Signature	Print Name	Signature