SAFETY POLICY

Carleton Lab is an active heavy civil engineering testing lab. This lab is not only subject to the standard safety regulations for chemical labs, as mandated by EH&S and FDNY, but also further safety regulations that are common in manufacturing facilities and construction sites.

RULES OF CONDUCT
• Guests must register with lab management. “Browsing” of the lab is dangerous and will result in expulsion from the premises.
• No person is allowed outside of white lines without completion of Machine Shop Safety Training and receipt of Carleton Lab safety sticker.
• No laboratory property may be removed from the premises unless authorized by lab management.
• The entire lab is an active forklift and crane lift area. Persons without rigging training must always yield to cranes and forklift.
• Eating and drinking is prohibited in active lab space.
• Open shoes, loose clothing, and shorts and short skirts are prohibited in active lab space.
• Lab machinery and equipment may only be approached and/or operated with the express training and permission of the lab staff.

FLOOR MARKINGS
Important: colored cones forming a line are equivalent to floor lines.

Traffic Area – main traffic routes through lab; keep area clear of obstructions; beware of moving vehicles. Persons without safety training are to remain in these areas unless authorized by lab staff.

Physical Hazard Area – this area contains a physical hazard, entry with express permission by laboratory staff only.

Clean Area – enter only with clean clothes and shoes, and do not bring tools, chemicals into space. Food and drink are allowed in this area.

CEILING LIGHTS
Fire Equipment

STROBE LIGHTS
Amber – active forklift and/or crane, yield to horizontal/vertical transportation and rigging at all times.

Green – hazardous test in progress, enter area only with express staff permission. Tests may be automated, so staff may not be present.

AUDIBLE WARNINGS
Siren (high pitch) – single blow signal when remote control crane is activated. Operator may also blow siren to signal users to clear area.

Buzzer (low pitch) – signal used to warn persons of active testing
• one blow – prepare for test, clear area
• two blows – area clear, test commencing – blown before each test
• three blows – test completed, area safe

Bell - fire alarm, evacuate building immediately, close but do not lock all doors on the way out.

Important: The Engineering Terrace building is equipped with a NYC Code Fire Alarm System; this system will only sound two sets of four bell rings. All personnel must evacuate, even if the bell stops ringing.

FORKLIFT SAFETY
• In the lab pedestrians must yield to the forklift. Due to the limited line of sight of the forklift operator in many loading and lifting situations, you must assume that the forklift operator cannot see you.
• Never walk directly in front of, behind, or beside the forklift when it is in motion.

RIGGING SAFETY
The lab is equipped with a number of remote controlled gantry cranes. Be aware of their presence at all times. The hi-bay area contains three trambeam cranes that can move within the entire hi-bay space and parts of the mezzanine.
• Never step under a crane, be it loaded or unloaded.
• Always look up and check for the position of cranes before entering the high-bay area. A flashing strobe indicates that the crane is active. The lab also has a number of removable floor panels. Be aware of these when you are walking. Never cross an area that is cordoned off with yellow cones. This is a warning that hazards lie beyond this point. Ask the lab staff for a safe path in case a normal route is obstructed.

MACHINE SAFETY
Active machinery should be approached only with the permission of the operator of the machine. Appropriate Personal Protective Equipment (PPE) – i.e. earplugs, safety goggles, etc. – must be worn. Only authorized persons are allowed to use the machinery in the laboratory and in the machine shop. Machines may be used only by staff and students who have been properly trained by the lab personnel. Long hair must be tied back, and loose clothing and neckties are strictly prohibited. Machines may not be used by a person who is alone – an authorized “buddy” must be present at all times.

ACCESS & SECURITY POLICY

Access to Carleton Lab is controlled by Columbia University’s proximo access system as well as a closed-circuit cameras. It is a violation of policy to swipe in unauthorized persons and will result in disciplinary action and loss of laboratory access.

CLASS ACCESS
Undergraduate and graduate students taking a class that contains a laboratory teaching component must apply for Class Access via the Carleton Laboratory website after completing online shop safety training. Access is restricted to the meeting time of the lab class and rescinds upon completion of the class. This application must be filed with the laboratory only once. Access will be granted automatically for all future classes if the student is registered for the class.

Absolutely no independent work may be performed with this level of access.

RESEARCH ACCESS (INCLUDING SEM RESEARCH ACCESS)
All undergraduate and graduate engineering students may apply for daytime lab access via the Carleton Laboratory website only upon completion of online safety training. Students who are working in the Carleton Laboratory on research projects beyond normal business hours will have to apply for 24 hour access. Mezzanine access may be granted to students with labs on the mezzanine level. All persons working in active laboratory areas outside of lab operating hours must obtain a C-14 Certificate of Fitness. Students using only office space within the laboratory (marked blue) must not obtain a C-14 but are strictly limited to these spaces outside of operating hours. Research access permissions rescind on 31 May annually but may be renewed/extended online.
HOW TO APPLY FOR ACCESS

To apply for laboratory access, go to: http://carleton.columbia.edu/

RESEARCH ACCESS
Research Access is defined as any access to the Laboratory to perform independent work that is not directly associated with a constantly supervised laboratory class. Research includes undergraduate and graduate independent research, student club work, Ph.D. research, and use of the Scanning Electron Microscope (SEM). Undergraduate students may apply for daytime access while graduate students and researchers may apply for 24/7 access; the following requirements must be fulfilled:

1. Legitimate academic need to use laboratory.
2. Faculty liaison: all students and student groups must have a faculty advisor/sponsor
3. Certifications
   a. Machine Shop Safety Training – required for all persons present in the laboratory
   b. Laboratory Safety/Chemical Hygiene/Hazardous Waste/Laboratory Fire Safety Training – required for all persons working with any chemicals
   c. Certificate of Fitness (C-14) - required for all persons requesting access outside of laboratory business hours. Students using only office space within the laboratory (marked blue) must not obtain a certificate of fitness but are strictly limited to these spaces outside of laboratory operating hours.
4. Access Application – fill out online application for the appropriate level of access and upload your training certificates
5. Carleton Lab Sticker: after filling out the application, go to the management office to receive your “Carleton Lab” sticker.
   Faculty + Staff
   Research
   Class
   SEM
   Visitor
6. With the exception of Faculty & Staff access, all access permissions rescind on 31 May of every year.

SEM RESEARCHERS
Users of the Scanning Electron Microscope must also successfully complete SEM training and be certified by a member of the SEM super user team before starting the access application process. SEM access is a restricted profile, allowing only access to the SEM room; the rest of the laboratory is off-limits to all SEM users.

VISITORS
Visitors must be appointed by the University in order to be allowed to perform any laboratory research. Visitors without an appointment are prohibited from performing any work in the laboratory.

SAFETY TRAININGS

MACHINE SHOP SAFETY TRAINING
Hand and power tools are routinely used in various machine shops at Columbia University. When not used properly they can cause serious and sometimes fatal accidents and injuries. Personnel using tools, machines and equipment in academic shop are required to attend this training because understanding of potential hazards and observing proper safety guidelines can help to reduce accidents and injuries.

This training program provides a basic overview of hazards associated with the use of hand and power tools that are found in academic machine shops. The training covers types of hazards, general shop safety rules, ways to keep shop clean, usage of safe work practices and use of proper personal protective equipment for the task. This training, however, IS NOT a substitute for a machine specific safety training that must be provided by your supervisor before you use any machine in the shop. The course also meets the training requirements of various OSHA Standards and University policy.

At the conclusion of this course you must take a short quiz to verify that you have completed the course and understands its contents. Upon passing the quiz (80% correct answers are required to pass); you should print the certificate as a proof of course completion and present it to your shop supervisor and arrange for a machine specific training before using any machine. Please go to the Rascal Training Center to take the Machine Shop Safety training course. The training course can be found: Training Center > Safety Courses > Shop Safety Training.

LABORATORY SAFETY/CHEMICAL HYGIENE/HAZARDOUS WASTE/LABORATORY FIRE SAFETY TRAINING
Environmental Health & Safety policy requires that all persons working with any chemicals in the laboratory be trained attend an initial training session and perform a refresher training every three years thereafter. Persons who have not completed this training will not be allowed to handle any chemicals. Please see the EH&S Website for an updated training schedule.

CERTIFICATE OF FITNESS (C-14) TRAINING
Carleton Laboratory is required to have a C-14 Certificate of Fitness holder present at any time when the laboratory is in operation. This is a simple certification by the FDNY that proves an understanding of basic fire safety in a laboratory environment. Both the manager and assistant manager of Carleton Lab hold C-14 certifications, so all activities performed during normal operating hours of the lab do not require the individual user to be certified.

However, any researcher who works in the Carleton Laboratory (including Burmister Laboratory) outside of normal operating hours (9:00am to 5:00pm M-F) must obtain a C-14 Certificate of Fitness. Columbia Environmental Health and Safety (EH&S) holds a one-hour certification class every week. An important qualification for this certification is a completed M.S. degree or a B.S. degree with two years of laboratory experience. A copy of your diploma must be brought to the certification session. The certification process is sponsored by Columbia University, so the application process is free to all students, faculty, and staff. Please see the EH&S Website for further information on the C-14 Certificate of Fitness.