Last Revision: 28 August 2018

Mechanical Engineering Teaching Laboratory Safety Procedures

Original Implementation: August 2015

Purpose

The purpose of this safety and procedure document is to provide students who are enrolled in Mechanical Engineering Teaching Laboratories with an understanding of the laboratory facilities at KUME and their safe and proper use. Specifically, students should gain an understanding of their responsibilities with regard to:

- safety
- what to do in case of an accident
- space usage
- equipment training requirements and usage
- equipment/tool checkout/use procedures
- access to ME lab areas
- access and use of the Machine Shop
- access and use of other ME areas

This brief introduction should help KU students as they progress in their Mechanical Engineering education at KU. This information will be used for several classes with laboratory sessions, any undergraduate research experiences and, perhaps most importantly, in the capstone senior design project.

Student Laboratory/Area Descriptions

Room/Area	Current Purpose/Use	Access/Safety Level in Room
Learned B-160	ME Machine Shop Laboratory	**Faculty/Staff Supervisor Required** EHS safety training certificates and machine specific training Safety glasses, eyewash station, ear plugs, and first aid kit provided.
Learned B-171	Capstone Senior Design Projects	**Restricted via Door Code** "buddy system" of safety Safety glasses, eyewash station, ear plugs, and first aid kit provided.
Learned 1101	Design projects area for Formula SAE and some faculty research	**Restricted via Door Code** "buddy system" of safety Safety glasses, eyewash station, ear plugs, and first aid kit provided.
Learned 1101A	Instructional and research machines	**Authorized Supervisor Required**
Learned 1100	Freshman mechanical engineering laboratory and maker space	**Restricted via Door Code** "buddy system" of safety Safety glasses, eyewash station, ear plugs, and first aid kit provided.
Learned 3117	24 hour computer lab for students	Open to ME students only with code
Learned 3127	Mechanical engineering Lab and maker space	**Restricted via Door Code** "buddy system" of safety Safety glasses, eyewash station, ear plugs, and first aid kit provided

LEEP2 1421	Materials testing lab	**Restricted via Card Access** "buddy system" of safety Safety glasses, ear plugs, and first aid kit provided
LEEP2 1427	Instrumentation lab	**Restricted via Card Access** "buddy system" of safety Safety glasses and first aid kit provided
KU West Campus Student Project Space (KUSP	Capstone Senior Design facility	**Restricted via Card Access** "buddy system" of safety Safety glasses, eyewash station, ear plugs, and first aid kit are provided
Hill Center	Undergraduate Research Facility	**Restricted via Key Access** "buddy system" of safety Safety glasses, eyewash station, ear plugs, and first aid kit are provided

Details of the restrictions for each area and the equipment in that area will be provided when access to that space is granted.

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Operation of Machines and Equipment

Safety of the students, faculty and staff is the highest priority regarding the operation of machines/equipment and the use of tools in the ME or ME-shared space. Procedures have been developed to provide a safe environment while still providing the desired educational and/or research experience.

The following list is a general outline of the student responsibilities and safety guidelines that are established in detail and documented in the ME department. If these safety guidelines are not followed, student privileges may be revoked. Revoked student privileges can only be reinstated by the ME Department Faculty.

Student Responsibilities and General Safety Guidelines

- Project groups or individuals must follow all published safety procedures. Each member of a project team or lab group is responsible for ensuring the safety of his/her team members.
- Project groups or individuals are responsible for clean up of the areas to which they are assigned or use at the end of each work period.
- Project groups or individuals are to act responsibly in using only the tools/equipment/space on which they have been trained and authorized to use.
- Project groups or individuals must follow the safety guidelines regarding authorized supervision and/or the "buddy system" for each area and/or machine.
- Each individual or member of a project team must be trained and sign a form indicating that he/she understands and will adhere to the procedures governing safety and use of a machine/system/area prior to use.
- Individual pieces of equipment (excluding general laboratory equipment such as used in ME 307 or ME 455) will have tags on which authorized and trained users are listed. If your name is not on that list, don't use the equipment. If you need to use it, ask an authorized supervisor for help and/or take the necessary training.
- Students must carry their KU ID with them at all times when using the laboratory areas or equipment. Verification of the student authorization for use of the space/equipment can be made at any time by any ME faculty or staff.
- Do not loan keys, give out keypad codes or combination lock information to any unauthorized persons – in or out of KUME.
- Do not allow unauthorized people to use/operate ME machines/systems.
- Be responsible for assuring the supervisor is in the room (if required). Students must shut off any machines, clean up as needed and leave if the supervisor leaves.
- On the first violation of these guidelines, the student/group will lose access for 1 week. On the *second violation*, the student/group will *lose privileges for 4 weeks*. On the **third violation**, the student/group will **lose privileges for the rest of the semester**. Any individual/group found using the facility during a suspension will automatically lose privileges for the rest of the semester. Only the ME department faculty can reinstate privileges.
- An individual's actions can affect the entire group's privileges.
- Students must return all broken tools and equipment to authorized personnel responsible for those items. If the student does not return the item(s), he/she will be charged for the item(s).
- An honor code is in force, in which students are responsible to assure other students follow the safety system. We are all members of the ME department – we are all responsible for each other's safety. Penalties for failing to report violations may be equal to the penalty for the violation itself. To report violations, please call or email the ME office (785-864-3181, kume@ku.edu).

- Students must read and understand the KUME Controlled Areas Access Approval Form saying they understand and will abide by these rules and other specific rules for an area, machine or system. See the last page of this document for check off.

What is the "buddy system" and why is it so important?

The "buddy system" requires that there must be a second person in the room when anyone is in the room even if the machines are not in use. Machines, tools and equipment may not seem dangerous at first, but they can be deadly. It is important that there be a second, non-injured person to get help in case of an accident. Often an injured person is "dazed" or does not think straight. The second person can literally save the injured person's life and limb. Even if machines are not in use, it is often the case that chemicals or solvent are in use in the area. It is possible that a person using certain chemicals and/or solvents may spill these materials, possibly causing chemical burns or dangerous inhalation. Again, a "buddy" can save a life in such a situation.

The "buddy system" is important. By not following this system, you could lose much more than just student access privileges.

General Safety Guidelines

THINK AHEAD.

Don't fool yourself into thinking that you can't get hurt!
A fraction of a second can change your life forever.
Never trust mechanical devices – things go wrong.
Never place yourself in a position where you could be hurt if something mechanical failed.
Watch for possible pinch points, especially for your hands.
Give your undivided attention and thought to the task before you.
Daydreaming or talking with a friend reduces your attention on the job.

USE COMMON SENSE!

General Machine Shop and Testing Safety

1. Always wear safety glasses or face shields when operating any machine or doing work in the machine shop.
2. Wear shirts with short sleeves, sleeves cut off or rolled up above the elbows.
3. Wear clothing appropriate for the activity in which you are involved (e.g., no shorts during welding).
4. Do not wear loose or torn clothing that may get caught in equipment or machines.
5. All jewelry that may get caught in machines or equipment should be removed.
6. Do not wear any dangling electrical devices such as headphones, etc.
7. Your feet are important too. Do not wear open-toed shoes or sandals in the shop.
8. Handle sharp or rough materials with gloves, but remove the gloves before using the machine.
9. Always turn the machine off before handling any material.
10. Your hair should not be at risk of getting caught in any equipment. To protect long hair, you may wear a hair net, tie it behind your head or ear or wear a suitable hat that keeps all hair away from the machine.
11. When doing mechanical testing, always keep your hands and other body parts away from the test area and off of the specimen.
12. As with potentially dangerous equipment, please do not operate the machine shop or laboratory equipment when you are sleepy or extremely sleep deprived.

What to do in case of an accident….

Accidents happen. Quick and proper response to an accident can save further personal injury, pain, damage to equipment and money. Sometimes it can even save a life….
If someone is hurt:

- Remain calm. Think clearly.
- Shut off machines/equipment.
- If the injury is serious, call campus security at 911.
- Find a faculty or staff member to help. Call extension 3181 if between 8 am and 5 pm or leave a message about what happened if after office hours.
- To whatever degree possible, ascertain the status of the injured person (for example, heart rate, breathing rate, hot, cold, conscious, etc.).
- If conscious, keep the person mentally active to minimize shock.
- If unconscious, keep the person warm, dry and reasonably comfortable.
- Use a medical kit to stop bleeding. Protect yourself from any blood borne pathogens as well.
- If a person can move, elevate the hurt body extremity.
- Carefully move potentially dangerous items from injured person's vicinity.
- Do not move the injured person significantly as long as the situation appears to be non-threatening.

If a tool, piece of equipment or a machine is damaged:

- Whether damaged in your use or not, report the damage to a faculty member, the ME head machinist or other ME staff.
- Detail how the damage occurred (if known).
- Do not continue to use the damaged tool, equipment or machine.
- If you damaged the item, check on additional training to learn what can be done to reduce the probability of future damage.
- Once repaired, request a supervised "first run" from an authorized supervisor.

The procedures and guidelines detailed in this document are similar to the regulations enforced in professional engineering settings. The procedures were developed to help protect KUME students, staff, faculty and resources.

Please help us provide you with a positive learning experience by following these guidelines.

Place a <u>check in the circle,</u> indicating you have read this document and the statement below!

○ **Signing this form certifies you have read the <u>entire form</u> and agree to abide by these rules of conduct. It is your responsibility to help assure our facilities are operated in a safe and secure way.**

○ I also confirm that I have read and I understand the <u>KUME Controlled Access Approval Form</u>.

Printed Name: _____ Student KU ID No: _____

Signature of Student: _____ Date: _____