Diane Bryant Engineering Student Design Center

Safety Policy and Shop Rules

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Safety Policy and Shop Rules Document

This document will be required knowledge at minimum for all students and staff to first access the Diane Bryant Engineering Student Design Center (ESDC) for class or daily use. All persons expecting to gain shop access must read, sign, and date the Safety Record Agreement Form after reading and understanding the Safety Policy and Shop Rules document. This form will be authorized by an ESDC staff member upon completion. The agreement form is valid for up to 2 years after signing. At the discretion of the ESDC Shop Manager, the shop user’s knowledge and skill in the shop may need to be re-assessed after this point.

In conjunction with the Safety Record Agreement Form a safety quiz will be assigned; a passing score of at least 90% is required.

Why is Safety Important?
The following safety procedures are provided to prevent workplace injuries for shop users and staff operating within the Diane Bryant Engineering Student Design Center (ESDC). A safe workspace will foster a productive and healthy environment in which you and the shop equipment are unharmed. Our intent is that this document provides the most essential information needed concerning the various aspects of our daily work routine. This document often refers to other safety documents that can be found on the ESDC website.

Golden Rules of the ESDC

1. Safety glasses must be worn AT ALL TIMES in all specified areas of the ESDC.
2. Only closed-toed shoes which cover the entire foot may be worn. No sandals, flip-flops, or ballet flats.
3. Long pants are required. No exposed ankles. Please avoid jeggings/leggings or pajama-like material. Jeans or denim is preferred.
4. At Machines: No loose clothing. No dangling jewelry. No dangling hoodie strings. No watches, long hair must be tied up, long sleeves must be rolled up. Please remove them or tie them up.

The policies and rules described in this document must be followed by all users of the ESDC at all times. Violation of any safety policy or rule may result in loss of facility access or other disciplinary action, at the discretion of the ESDC Shop Manager.
ESDC Overview
The ESDC was established in May 2023 and is located at 1500-1547 Bainer Hall on the UC Davis campus. Bainer Hall houses the departments of Biological and Agricultural Engineering (BAE), Chemical Engineering & Materials Science, and Mechanical and Aerospace Engineering (MAE), as well as Civil Engineering laboratories.

Figure 1

The ESDC is the UC Davis College of Engineering’s (COE) primary teaching and prototyping shop. It supports COE courses, student projects, student teams and research. To meet the rapidly growing demand for collaboration and entrepreneurship among UC Davis engineers, the facility was renovated in 2023. The ESDC was expanded from approx. 9000 ft² to 23,000 ft² with $22M philanthropic fundraising.

Department
The ESDC is overseen by the Deans Offices within the COE. They are responsible for:

1. Ensuring that internal and external regulations and guidelines are adhered to.
2. Assigning necessary management with the authority to implement safe work practices.
3. Maintaining an up-to-date Injury and Illness Prevention Program that covers the ESDC
4. Providing the ESDC with the resources necessary to comply with health and safety policies and guidelines.

**ESDC Features:**

The goal of the ESDC is to transform how students engage in design curriculum, foster collaboration on interdisciplinary projects, learn about entrepreneurship, and receive hands-on experience to complement classroom theory. The ESDC provides a safe, supervised environment, where students have ample opportunity to learn, practice and master cutting-edge equipment! A floorplan of the ESDC can be found below in Figure 2.

![Figure 2](image)

**Student Startup Center (1501 Bainer)**
This entrepreneurial center is the home to the student startup center. This room has dedicated space for presentations, meetings, and brainstorming needs. The room also has virtual reality meeting capabilities.

**Electronics and Rapid Prototyping room (1502 Bainer)**
This Lab includes additive manufacturing equipment (3D printers), and laser cutting. It also enables electronics build-up including soldering stations, circuit building, reflow oven, and a PCB mill.
Conference Room (1503 Bainer)
This conference room a professional meeting space for clients or internship site supervisor. It is equipped with whiteboards, projectors, zoom capabilities, and an executive style table.

Machining and Fabrication Lab (1545 Bainer)
This lab comprises of machines for metal fabrication. The lab includes manual and CNC milling machines and lathes. Cutting and grinding equipment are also available. Hands on classes will take place throughout the year for students to gain these necessary skills.

Welding Area (1545B Bainer)
This partitioned welding room is equipped with TIG, MIG, and gas welding. Four welding tables are available with ample fixture tooling for welding processes.

Staff Office Suite (1514 Bainer)
This area houses the greeting kiosk, staff, and Managers offices, as well as staff break and staff changing rooms. Only the ESDC staff has the access to these rooms. The ESDC staff can greet entering shop users, answer questions and monitor operations from here.

Huddle Rooms (1508, 1524 Bainer)
The huddle rooms provide space for students, staff, and faculty to meet and collaborate. Each room is equipped with projectors, zoom capabilities, white bords and tables.

Sanding and Shaping room (1518 Bainer)
This room is dedicated to the sanding and cutting of composite workpieces. Downdraft tables are available to remove debris and particulates away from users.

Carpentry Room (1520 Bainer)
The carpentry room provides a space for the cutting, drilling, milling, planning, and shaping of wood pieces.

Composites Lab (1522 Bair)
The composites lab is the dedicated area for layout of composite work. Epoxy mixing, shaping and curing as well as mold setups and composite fabric cutting will take place here.

Instructional Design Classrooms (1526, 1528 Bainer)
These 45-person classrooms are operated by COE and equipped with Interactive projection with instructor programmed control. Via large roll-up doors they can be opened to be included in the collaborative zone.

Collaborative Zone (1545C Bainer)
This reconfigurable space enables teams and the individuals to work on cross-discipline projects, the space also has the provision for welding, assembly, competitions, drop and vehicle testing.
Baum Shelter (1547 Bainer)
The outdoor student plaza, on the westside of the ESDC, provides the space for large project assemblies, drop testing, sketching workspace and vehicle access. Events can also take place such as competitions, club meetings and project showcasing.

ESDC Staff
Under the supervision of COE and present onsite the ESDC staff includes:

Jose Mojica (Shop Manager)
David Kehlet
Michael Fish
Jeffrey Ortiz
Josh Ira

- Teaching assistants (TAs) and graduate student researchers (GSRs)
- Graduate and undergraduate shop technicians

Shop Staff Responsibilities
The shop staff play a key role in the day-to-day operation of the ESDC. The shop staff can be found on the shop floor or the office suite. Shop staff are there to ensure safety practices, maintain shop equipment, conduct lab instructions, and answer questions. Regardless of position instruction from an ESDC staff member is to be adhered to without question. The ESDC staff is friendly and open to advice and concerns about using the facilities. Questions are welcomed and encouraged!

ESDC Access, hours of operation and scheduling

Building access
College of Engineering Students, Student Start Up Center, and UC Davis sanctioned student team members will have access to the ESDC, with priority given to COE and Student Start Up Center members. The ESDC has five main access points to users from the outside, controlled by the Aggie Access phone app or key cards: (1) The Main lobby, (2) The Student Startup Center, (3) The Bainer corridor, (4) the Instructional Classrooms, and (5) the West Plaza (See Figure 4 below). Access to these is dependent on the time of day and specific training of the user.
Access Badge (Make Pass)
All trained users and those users looking to have limited un-escorted access in the ESDC will require to wear a badge that is always visible to staff. Make Passes will display the users Picture (taken at the ESDC office), Name, and completed training stamps (see Figure 3). Badges will first be issued free of charge after completing the Safety Policy and Shop Rules Quiz. Any additional training will require the issue of a new card at no cost to the user.

Lost badges: Users are responsible for bringing their Make Pass to access the ESDC with every visit. The first time that a user forgets their badge they will be able to receive a temporary badge after checking in with staff at the staff office. Sequential instances of not bringing a badge will result in denied access or the user may choose to pay out of pocket for a replacement badge.

![Figure 3](image)

Hours of Operation
Hours of operation may change, depending on the quarter, academic schedule, machine availability and staff availability. Please check [design.engineering.ucdavis.edu](http://design.engineering.ucdavis.edu) or the main entrance shop calendar for updates.

Monday-Friday
- **9am – 5pm** → Classes, open lab, tours, and shop activities are all taking place. Access to machines and shop features are based on user completed training.
Safety Policy and Shop Rules – University of California, Davis – Engineering Student Design Center

- **5pm – 8pm** → Classes, open lab and shop activities may be taking place depending on academic quarter. Access to machines and shop features are based on completed shop training.

- **9pm – 8am** → Closed.

*The ESDC is closed Saturday and Sunday unless otherwise specified.*

Regardless of what area of the ESDC you are working in clean-up is 30-minutes before lab ends or 30-minutes before the shop closes. No machines or tools will be in use at this time. Plan work accordingly.

**Contact**

Phone Number: 530-752-1011

Email: design.engineering.ucdavis.edu

Address: 1500-1547 Bainer Hall
University of California
One Shields Ave, Davis, CA 95616

**Room & Machine Scheduling**

After a user completes machine training, they can activate the machine using their Aggie Access phone app or with their Aggie Access badge.

ESDC conference room, instructional classrooms, and huddle rooms can be scheduled using COWS [https://cows.ucdavis.edu/](https://cows.ucdavis.edu/).

**Shared Team Spaces**

Allocated spaces and designated toolboxes in the Collaboration Zone of the ESDC can be requested by UC sponsored teams based on need and available space. All teams must adhere to ESDC rules and directions about space allotment and hazardous material prevention. Team leads should contact the ESDC staff to inquire about participation.
Personal Protective Equipment (PPE)

This section outlines the minimum training and personal protective equipment (PPE) required to be in a particular area of the ESDC. Note this is the minimum, and there may be additional training or PPE required as specified by the ESDC staff. See Figure 4 and Table 1 below.

![Image of a floor plan with different zones marked]

Figure 4

**Table 1**

<table>
<thead>
<tr>
<th>TIER</th>
<th>Minimum PPE</th>
<th>ROOMS/SECTIONS</th>
<th>Note</th>
</tr>
</thead>
</table>
| 1.   | • No PPE required | 1. Classrooms*  
2. Huddle rooms 1 & 2  
3. Conference room  
4. Student startup center  
5. Main Lobby  
6. West student plaza*  
7. Staff areas (staff offices/Break room) | *Appropriate PPE if used as teams’ work area. |
| 2.   | • Glasses,  
• Long pants | 1. Collaborative work zone  
2. Machining & Fabrication  
3. Mudroom | Training may be required depending on equipment used |
Minimum Required PPE includes:

Safety Glasses

Eye protection that meets the American National Standards Institute (ANSI) Z-87+ standard must be worn at all times while in the ESDC, except for offices, the restroom, and the washroom. Due to the influence of COVID and its contagious nature, the ESDC cannot provide safety glasses as it has in the past. Users are expected to bring their own pair of safety glasses when visiting any ESDC space. Glasses can be bought from the MU bookstore or Ace Hardware in downtown Davis.

For people who wear corrective glasses, ANSI approved eye protection must be worn over glasses. Prescription-ground safety lenses may be substituted if they provide equivalent protection and if side shields are firmly attached to the glasses frame.

Closed-toed shoes

Full-coverage, closed-toe shoes must be worn when in the machine shop. The entire foot must be covered.

Thin fabric shoes or ballet flats are not acceptable for working with any machine tool or equipment, hand tool, sheet metal or metal scrap, and welding equipment.

Long pants

Long pants must be worn when working with any machines, tools or equipment, sheet metal or metal scraps or while staying in the machine shop for extended periods of time.

All lower body skin must be covered. Chips can easily enter shoes and cut any exposed skin.
At Machines: Tied back hair, rolled up sleeves

Long hair must be tied up and not draped over shoulders when using rotating machinery. Loose hair and long sleeves can become easily entangled in the rotating parts.

Long beards (about 3 inches below the chin) must be tied up to keep them away from rotating machine parts.

At Machines: No loose clothing. No jewelry. No dangling hoodie strings.

Ties, rings, watches, bracelets, unbuttoned long sleeves, dresses, or other loose clothing cannot be worn while operating machinery. Tuck in, roll up, or remove all loose articles of clothing. Loose head wraps should be tucked in under shirt collars or tied back.

Do not wear gloves when operating any rotating machinery.

However, gloves are recommended for handling sheet metal sharp tools or hot materials.

Additional PPE

- **Clear Face Shields**: Both full-face shields and safety glasses are required for all grinding operations. Full-face shields are provided in the grinding area, the welding area, and the woodshop room.

- **Tinted Face Shields**: Properly tinted face shields will be provided when observing the gas welding processes to protect eyes from the bright light emitted by the flame. Safety glasses must still be worn under the tinted face shield.

- **Bunny Suits**: Used in composites room to ensure particulates don’t adhere to users clothing.

- **Respirators**: Personal respirators will be provided for the Sanding and Shaping, and Composites rooms. These respirators will need to be worn at all times while working in these areas.

- **Welding Jackets and Gloves**: Due to the light emitted from welding arcs, jackets are provided to prevent this light from burning skin. Gloves are also available for handling hot work material.
**Shop Rules and Guidelines**

**General Safety Guidelines and Rules Around Machines**

- Do not design or build any type of weapon. Authorities will be contacted if there is any suspicion of weapon building or manufacturing.
- Any project brought into the shop must be academically related.
- If there is any uncertainty on how a tool or machine should be used, do not hesitate to ask an ESDC staff member for help or clarification. It is better to ask for an explanation than it is to take a potential risk.
- Provided machine guards and shields must be in place whenever the machine is operated.
- Turn off machines and wait for any rotating parts to come to a complete stop before reaching in to measure or inspect the part.
- Cutting tools and cut edges are very sharp. Avoid skin contact with mill cutters, metal chips, and metal burrs. Move tools or vises away before reaching in to measure or inspect the part.
- Never leave a machine tool running unattended.
- Always remove the chuck key immediately after use and place the key in the holder before operating any machinery. Every machine has a designated chuck key holder. Remember the mantra: “The chuck key should be in your hand or in the holder.”
- Each machine may only have one operator at a time. There should never be more than one pair of hands touching the machine and its components.
- Headphones, earbuds, AirPods, or the like should not be worn in the machine shop. It is important to be able to hear any announcements or emergency alarms in the shop. Leave these distractions in backpacks.
- All attention must be on the machine tool being used. Do not utilize cellphones, smartphones, or music players while operating a machine. Leave these distractions at the workbenches.
- Ear protection is available for those sensitive to loud machine sounds.
- Machine operators should not be startled while in contact with the machine. Avoid sudden loud noises when others are using machine tools in the same room.
- Machine tools and hand tools that are broken or unsafe should not be used and should be reported immediately to an ESDC staff member. An ESDC staff member will lock out the machine or tools in need of repair.
- Keep shop rags away from all rotating machinery.
- Wipe up any leaking or spilled oil with a shop rag. Oily shop rags should be disposed in the yellow rag’s container.
- All machines and the surrounding work area must be thoroughly cleaned and wiped down after use. Floors must be swept. All trash or metal chips must be placed into their respective disposal containers.
- Clean up is 30-minutes before the shop closes. Thoroughly clean and return all tools to their correct places.
- Always keep fingers and hands away from cutting blades. Use a push stick (also known as a chicken finger) to push material into or away from cutting blades on vertical band saws or table saws or mills.
- Compressed air is used for cleaning surfaces and parts. It must never be pointed at the body or another person for any reason. Do not use compressed air to blow chips off clothing or out of hair. Each nozzle is equipped with a cone/shield attached to it. If it is missing or broken, please bring it to the attention of an ESDC shop staff and it will be repaired or replaced.
- Ask an ESDC staff member to change chucks on lathes or vises on mills.
- Do not attempt to lift more than 50 lbs unassisted and ask others to help in lifting any heavy tools, attachments, or equipment.
- Ask a qualified ESDC staff member for help with using the hoist, fork truck, and other lifting devices as needed to prevent back injuries.
- Keep aisles clear of clutter and debris. Avoid tripping hazards. Hang backpacks up on the hooks under the workbenches.
- Electrical panels must be kept clear of obstructions so that emergency personnel can access if needed.
- With the exception of EME 50, BIM 110, and Training courses (which all have applicable class fees), do not expect to find free material in the shop. Please bring personal material for future projects.
- Nitrile or latex gloves may be used for handling chemicals. Leather gloves are necessary for welding and handling hot metal. Leather gloves may also be used for handling sheet
metal with very sharp edges. However, gloves may not be worn around rotating machinery.

- Safety is everyone’s responsibility. Use common sense to avoid all potential dangers.

**Chemical Safety**

Safety Data Sheet (SDS) information is stored in the yellow binders located at the entrances of the Rapid Prototyping room 1502 and the Staff Offices room 1514. Consult the SDS to review the safety precautions of the chemical.

Flammable chemicals must be stored in designated flammable cabinets. Acids, bases, and strong oxidizing chemicals must be stored in segregated cabinets. The ESDC manager must be informed when a new chemical is brought into the ESDC and must be shown a printed copy of the SDS. This copy will add to the appropriate SDS binder.

Disposable nitrile gloves are effective barriers for most chemicals can be found in the shop areas.

Cutting fluid, coolant, lubricants, steel blue ink, and diluted cleaning solutions are used specifically in the machine shop areas. Chemical resistant gloves are not needed to handle these items but are available for use and can be found in the ESDC washroom.

In the event that a chemical makes contact with skin or eyes, eyewash stations and chemical showers can be found at the pillar near the staff offices 1514 Bainer, the center pillar in the collaborative zone 1545C Bainer, next to the sink in the Rapid prototyping room 1502 Bainer and next to the door in the Composites Lab 1522 Bainer.

Oil spills and splatters must be cleaned up with a shop rag and rags must be disposed in the appropriate yellow rags container. Alert an ESDC staff member when spills are too large to be absorbed by shop rags and the staff member will perform the appropriate chemical spill procedure.

**Practicing Safety**

All shop rules and regulations must be followed. This includes all published rules in this *Safety Policy and Shop Rules* document as well as any posted signs and warnings around the shop area.

Shop users exhibiting unsafe practices in the shop will be asked to stop working. If the unsafe practices continue, an ESDC staff member may choose to remove the unsafe shop user from the facilities.

In most cases, the first safety infraction will result in a verbal warning, the second in a written warning, and loss of shop privileges will follow a third safety offense.
Again: Safety is everyone’s responsibility. Use common sense to avoid all potential dangers.

**Working Responsibly**

Any disregard for machine protocol resulting in abuse or damage will be cause for disciplinary action.

It is important that you understand how to use the machines properly not only to ensure your safety and any people in the immediate area, but to also protect the functionality of the machines and associated tools for future users.

**Emergencies**

**Evacuation**

In the event of a fire or building evacuation, everyone must shut down the machines and calmly and safely leave the shop areas immediately. Locate the nearest building exit and follow the directions of the ESDC shop staff/Area Assembly Managers. They will instruct where to meet/gather and when it is safe to re-enter the building.

**In Case of Injury**

Injuries must be reported to an ESDC staff member. Anyone who is injured may need to be seen by a medical professional as soon as possible.

For small injuries such as skin cuts or abrasions, a First Aid kit containing bandages and ointment can be found near the sink area next to the Staff Offices room 1514. Wash wound with mild soap, dry and stanch the wound, then dress wound with a clean bandage.

Please follow the following chart to access injuries.
Call 911 for emergency care and transport to Sutter Davis Hospital. Reference the charts below in the case of a non-emergency.

<table>
<thead>
<tr>
<th>Non-Emergency, but needs medical attention</th>
<th>Normal Hours</th>
<th>After Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Student</td>
<td>Student Health</td>
<td>Sutter Urgent Care</td>
</tr>
<tr>
<td>Employee</td>
<td>Occupational Health</td>
<td>Sutter Urgent Care</td>
</tr>
</tbody>
</table>

**Treatment Facilities**

**Sutter Urgent Care**

2020 Sutter Place, #101, Davis, CA 95616

Covell Blvd, cross Hwy 113, turn right at Riesling Court

**Student Health and Counseling Services**

Located on campus

La Rue Road between Hutchison Drive and Orchard Road, across the street from the Activities and Recreation Center (ARC) and next to the Colleges at La Rue.
| Safety Policy and Shop Rules – University of California, Davis – Engineering Student Design Center |
|---|---|---|
| **Sutter Emergency Department** | **Occupational Health Clinic** |
| 2000 Sutter Pl, Davis, CA 95616 | Located on campus |
| Covell Blvd, cross Hwy 113, turn right at Riesling Court | Cowell Hall on California Ave |
| (530) 757-5111 | Call before walking over |
| 24 hrs/day | (530) 752-6051 |
| (530) 750-5830 (phones open at 5 PM) | M,T,TH,F 8 AM – 5:30 PM |
| Weekdays 5:30 PM – 9:30 PM | W 9 AM – 5:30 PM |
| Weekends/Holidays 10 AM – 5:30 PM | 9 AM – 5PM |