Dear Students:

CED's Fabrication Shop at 277 Wurster is a great place for learning how to safely use Shop tools while fabricating your creative vision. The facility primarily serves students currently enrolled at CED who may have courses that explore the modeling and execution of three dimensional designs. However, the Shop is available to all Wurster students, faculty, staff, and CED alumni (see page 5 for more information on the Alumni program) for your own extracurricular projects.

The Shop has a full complement of tools and shelves of supplies (see page 4) to support the variety of materials you may bring in, and experts to help guide you in safety and tool use. Specifically, the Shop features:

- A variety of woodworking hand and power tools.
- Metal fabrication equipment.
- MIG, TIG, and Oxy-Acetylene welding stations, as well as a small portable plasma cutter.
- A paint booth.
- A yard for concrete model casting.

We also provide a comprehensive 3-hour Shop Safety and Use orientation; but most importantly, we provide ongoing assistance from very knowledgeable and friendly staff.

All of us wish you success in building your designs.

Assistant Dean—IIT Patty Mead
Shop Manager Semar Prom

Shop User Requirements

There are requirements that all affiliates of CED must meet before they can use the Fabrication Shop.

1) Pay the appropriate Shop fees and receive a ticket verifying payment.
2) Successfully complete the Shop orientation.
3) Read and sign Shop-use waivers.
4) Affix the current Shop sticker on your student id card.

Undergraduate and other MSF Students

Shop payment is required for each academic term and due before orientation and access are granted. Payments are made at 477 Wurster Hall (using your Cal1 Card) where you will receive a “Shop” ticket to bring to orientation.

Professional Degree Supplemental Tuition (PDST) Students

No additional Shop fees are required for Fall or Spring semesters, but you will still need to sign up in 477 and pick up the “Shop” ticket. Summer is not included in the PDST fee calculation and so fees for Summer are required.

For instructions on how to obtain a Cal 1 Card or fund your Cal debit account, please visit the Cal 1 Card, or visit room 477 Wurster.
**Shop Practices**

As soon as you enter the Shop, please sign in on the red clipboard and show your validation sticker to a Mechanician on duty.

While in the Shop, you are a safety monitor too. Assist your colleagues to follow safe work practices and procedures, and inform a Mechanician of any safety violations or injuries immediately, no matter how small.

Instruction on the operation of tools and equipment must come from a staff Mechanician, not from other users. Also, report dull or damaged tools and equipment to a Mechanician at once.

Do not attempt to use equipment you have not been trained on; equipment you have been trained on is documented on your User Profile.

Do not talk to others while operating tools or machinery; keep your concentration on your activity. Likewise, do not distract other operators, except to caution them about an immediate safety hazard.

Do not attempt to adjust or clean machines until they have come to a complete stop and have been unplugged.

Do not walk away from a machine that is still running.

Follow Mechanician recommendations before performing any excessively dusty, loud, or potentially blinding activities.

Consult with a Mechanician on the proper way to dispose of finishes, solvents, casting resins, glues, or rags.

Dust masks, ear and sight protection are available for all users.

**Clean up after yourself!**

Untidy work areas are a serious safety hazard. All tools, machines, worktables, floors, and other work areas must be cleaned after use.

Return all tools and equipment to their proper place when you have finished using them.

Users who consistently leave the facility without cleaning risk suspension of Shop privileges.

If you’re ever in doubt about anything, please ask for assistance. Mechanicians are here to help you.

---

**Alcohol/Drug/Fatigue Policy**

As a matter of life and safety, please note the following policy.

*Alcohol, drugs, and all controlled substances are strictly forbidden in the Shop at all times.*

Shop users under the influence of alcohol, drugs, or any other controlled substance are strictly forbidden from entering the Shop and/or using any of the equipment.

Violation of the policy prohibiting alcohol or drugs will result in an immediate loss-of-use of the Shop for the remainder of the semester (without reimbursement).

Further, as a Shop is inherently dangerous, any external circumstances, including fatigue, may endanger yourself or others and will not be tolerated.

*Users showing signs of fatigue will be asked to immediately leave the facility.*
Orientations Policies & Outline

Orientations are offered a limited number of times at the beginning of each term. Users failing to attend orientation (or arriving late to the session or leaving early) will not be granted access.

Sessions are subject to cancellation in the event of insufficient enrollment; however additional orientations may be added if scheduled sessions are filled, or for the training of students not enrolled in classes. For information on upcoming scheduled orientation sessions, please send an email to Shop Manager Semar Prom at: s.prom@berkeley.edu

Orientations are participatory presentations in which students will practice the techniques demonstrated. Therefore, proper attire is required (see page 5). Students not appropriately dressed will be asked to leave and re-schedule attendance.

Introduction
Review Shop rules, procedures, and measures. Review appropriate Shop attire and Personal Protective Equipment (PPE). Discuss general housekeeping requirements.

Emergencies
Review location of emergency exits, fire extinguishers, and fire alarms. Review eye wash and First Aid stations, as well as earthquake response.

Materials & Purchasing
Discuss dimensional lumber, rough stock, and sheet goods. Demonstrate cross-cutting, ripping, and milling techniques.

Tool Use & Safety
Discuss the purpose and provide a description for each carpentry tool (saws, sanders, planers, drill presses). Present its features, and accessories and discuss the operation and safety devices that are available.

Finally, all waivers and forms will be signed and access stickers applied to student’s id cards.

Shop Refunds & Negligence

Student Refunds
Student requests for MSF Shop refunds must be made within 4 weeks from the start of instruction.

There are no refunds at the end of a semester, regardless of whether you used the facility or not, and there will be no refunds once you have taken orientation. (PDST Students are not given refunds.) Therefore, our suggestion is to not sign up for Shop if you are not sure your class requires Shop use.

What is a “refund”
“Refund” means moving funds back onto your Cal1 Card.

If you wish to have cash, you will need to make arrangements with the Cal1 Card office, details are available at:
http://services.housing.berkeley.edu/c1c/static/index.

Negligence
If you break equipment due to negligence, you will be asked to pay for its repair. The assessment of negligence is made in consultation with the Mechanician on duty, the Shop Manager and the Assistant Dean of IIT.

For example, if you are careless or do not follow instruction and the SawStop is activated, you will be asked to pay for the repair to the saw.

Benjamin Carpenter
Ben earned a B.F.A. in metalsmithing and an M.F.A in Sculpture, for a career building larger-scale architectural, kinetic, interactive and educational projects. We consider him an interactive artist/fabricator/teacher working in the space between industrial heritage and the momentum of contemporary media. Currently, he spends his time pursuing his interests individually and with the collaborative groups 5 Ton Crane and Applied Kinetic Arts.

Elizabeth Thorp
Liz is our Carpenter/Model Mechanician. She received her BFA in Sculpture from Rhode Island School of Design in 2007. Her own work explores themes related to inter-dependence and autonomy, drawing inspiration from the built environment and domestic surroundings. Concrete, steel, plastic, and drywall abut fabric, found furniture, and picture frame molding. The resulting works are sometimes objects, other times kinetic and installation spaces inspired by human interactions.
**Shop Fees Explained**

**2013-14 MSF Fees**
Effective Fall 2013 the cost for Shop will be $130 per semester (*an increase of $10*), and we will be asking for an additional $10/semester to take effect Fall 2014.

**2013-14 PDST Fees**
Fall and Spring Shop Fees are included in the Professional Degree Supplemental Tuition (PDST) program; Summer is not.

**What is not covered?**
What is not provided by MSF or PDST are the actual base materials (wood, metal, or concrete) from which students will design and build models, structures, or furniture.

**What do fees cover?**
**Staffing:** We are required by policy and regulations to have two journeyman level staff on the Shop floor during open hours to assure safe use of tools and the facility, and we maintain a 1 Mechanician to 20 students ratio. Mechanics are also responsible for the orientations and materials training.

**Supplies** - Your fees cover the cost of maintaining a full selection of supplies that may be needed for your projects, including: sandpaper, sanding discs, belts, or drums, various glues, epoxy, acrylic cement, acetone, alcohol, thinners/solvents, gloves, respirators, tape, construction pencils, knife blades, wood and sheet metal screws, nuts, bolts, nails, grinding and cutting wheels, flap-disc and wire butting wheels, rags, paint, spray paint, varnishes/lacquers, Welding wire and compressed gasses and propane, cutting fluid, kerosene, solder, sweeping compound, hand soap, paper towels, vacuum filters, first aid supplies, joining biscuits, foam-cutting wire, casting buckets, cold-weld epoxy, buffing wax, etc.

**Replacements** - Your fees cover the cost of replacement when 300+ types of hand tools (such as chisels, screwdrivers, etc), power tools, specialty tools, and accesso-

**Maintenance** - Your fees cover the cost of equipment maintenance: sharpening, machine lubricating fluid, belt dressing & replacements, filters, belt cleaning blocks, and various replacement parts as needed.

**Hazardous Materials:**
Your fees cover the cost of hazardous waste disposal and pickup.

**Compliance Activities:**
Your fees cover the cost of meeting EH&S and CalOSHA requirements for safety.

*If you have questions or comments on fees, please email Assistant Dean-IIT Patty Mead at pmead@berkeley.edu*
Artisan Crafts Workshops

The Artisan-Crafts workshops offered at CED are part of an ongoing effort to reach out to those Makers in the community interested in learning more about artisan crafts.

Register in Person: Register in #477 Wurster Hall (south tower) via check, money order, or CAL1 Card.

Register on Line: Go to http://www.regonline.com/2014CEDworkshops

No Refunds: Because artisans/crafts people and materials are arranged in advance, there will be no refunds given unless the session is cancelled.

Prerequisites: * Shop sessions: Shop Users are required to be 18 years of age or older. (17 year olds may attend if accompanied by a parent or guardian who is also taking the workshop.)

** Fees: All material costs are included in the fees except for Shadowfolds that may require additional materials.

Workshop Examples

- Construct a maple Dining Table*
- Construct Bar Stool*
- Construct metal Ball-peen hammer *
- Vacuum form masks*
- Construct a Tool Box*
- Origami with paper to make gift boxes and flowers
- Shadowfolds for fabric folding**
- Quilling with paper and then plastic printing
- Flatgoods engineering using Laser Cutters on wood
- Ring making in silver and copper*
- Cameo making with Mill, and welding*
- Construct a bed frame using CNC and wood-working tools*

Personal Protection & Proper Attire

Inside the Shop eye protection must be worn at all times. Safety glasses may be pulled from the general-use safety glasses in the box located at the Shop entrance.

(Prescription eyeglasses are not considered safety glasses.)

Excessive or loose clothing must not be worn. During most operations, push long sleeves up past the elbows.

Long hair must be tied back securely. Rubber bands are provided in the cabinet near the office door.

Non-slip shoes that completely cover your feet are required. Tennis shoes are okay. Open-toed shoes, flip-flops, sandals, ballerina flats, heels, or “Toms” are not permitted.

Legs must be completely covered by long pants. Shorts, skirts, dresses, culottes, tights, leggings, or Capri pants may not be worn in the Shop.

Jewelry such as necklaces, bracelets, watches, rings, and some earrings must be removed as they can get caught in the machinery.

Likewise, lanyards, scarves, or ties must also be removed.

Gloves are available, although they should not be worn for most operations.

Headphones, ear buds, mobile phones, or blue tooth headsets are not to be used in the facility. However, ear protection in the form of foam inserts or head gear (as in photo to right) are allowed and provided.

Gloves may not be worn for most operations.

CED Shop & CAD/CAM Alumni Membership

CED-affiliated Alumni are now able to work on their own projects in CED’s fully equipped Shop facilities. Memberships are now available throughout the year as described below.

Shop Memberships

Fall 2013:
Friday through Tuesday
11:30 am to 8:00 pm
8/22/13 until 12/20/13
Limited to 25. $350

Spring 2014:
Friday through Tuesday
11:30 am to 8:00 pm
1/14/14 until 5/16/14
Limited to 15. $350

Summer 2014:
Monday through Friday
11:30 am to 8:00 pm
5/28/14 until 8/16/14
Limited to 50. $350
**Equipment Updates**

**Vacuum Former**
The Vacuum Former is a thermo-forming machine. It can heat up sheets of thermoplastics like acrylic and polystyrene to a malleable state at which point is lowered onto a form. The sheet is then pulled onto the form by a vacuum. Ask a Mechanician on its use.

**Saw Stop Saw**
The CED Fabrication Shop has safety of its users as our primary concern. In keeping with that goal we have acquired a second Saw Stop table saw. These saws sense fingers from wood and can stop rotating blades with bullet-speed so that fingers are saved.

**Jointer Retrofit**
We have also retro-fitted our 16 inch jointer with a modern guard made by Suvamatic. This guard minimizes the cutting edge exposure and assist the user with extra support to get a better pass through the jointer.

**Model Station**
The "Model Station" is an area in the shop dedicated to working with smaller materials. This station consists of a mini-drill press, scroll saw, mini-miter saw, and a mini-table saw.

**Equipment Updates**

**Shop Hours**

- **Fall & Spring 2013**
  - Friday—Tuesday
  - 11:30 am to 8 pm
- **Summer 2014**
  - Monday—Friday
  - 11:30 am to 8 pm

**Renovations**
The Shop will be undergoing some renovations to increase lighting, to support the new CAD/CAM Construction, and to construct a new Shop Yard and paint booth. We will try to provide a week advance notice for any Shop shut-down so please keep an eye on the schedule posted on the Shop door.

**Hazardous Material**
CED is initiating a review of Hazardous Materials at Wurster to bring our safety program into compliance. Underlying this review is the acknowledgement that:

- Materials are brought in and used in many places at Wurster without review as to the safety of those materials.
- Few users have seemed to actually understand the requirements for handling or disposing of some of these materials.
- The Shop is currently the only approved place for the review and supervised use of hazardous materials. Hazardous Materials in this context may include: spray and brush paints, certain spray and brush adhesives, certain varnishes, some epoxy resin systems, etc.

Over the course of this coming year, CED will be building a new Shop yard and a new paint booth capable of safely handling certain Shop and CAD/CAM materials considered hazards. Additionally, CED is working on a list of authorized and restricted materials; Standard Operating Procedures for use, spills and first aid; and Safety Training requirements. Stay tuned!