

## **ECE 480 PROJECT AND LABORATORY GUIDELINES**

Welcome to ECE 480 laboratory. In the course of your design project you will be utilizing many resources available from ECE Technical Services, also known as the Shop. The Shop is located in room 3234 and staff offices are located in room 3231. Shop hours vary, but assistance is generally available from 8 A.M. to 12 P.M. and 1 P.M. to 5 P.M. M-F. You can also email your question or request to [eceshop@egr.msu.edu](mailto:eceshop@egr.msu.edu). Additional information can be found at the ECE Technical Services web page: [www.egr.msu.edu/eceshop](http://www.egr.msu.edu/eceshop).

### **Benches**

The ECE 480 laboratory has twenty benches, each with a computer (Windows 2000), test and measurement equipment, and basic hand tools. In addition, there are two machines set up with the ChipMaster 6000 programmer that utilize the Windows 98 operating system. An additional Windows 98 machine and one of the programmers contain the PIC debugger/emulation system. Lastly, there is one machine with Windows XP that has full multi-media capability.

Each team will be assigned a bench to use for the duration of the semester. This bench should be labeled with the team project name and the names of all the team members. The lab and all work areas must be kept neat and clean. There will be periodic inspections of the lab and any items left lying about will be thrown away.

Teams that have hardware and software needs not currently available in the lab should contact Brian Wright via email at [eceshop@egr.msu.edu](mailto:eceshop@egr.msu.edu), no later than the mid point of the semester.

Also available in the laboratory is a parts cabinet, soldering irons, test leads, wire, and storage lockers. The ECE Shop assigns storage lockers and padlocks. Please go to room 3234 to get your locker assignment and combination.

### **To Report Problems**

All hardware and software problems encountered should first be addressed with the laboratory instructor. If that person is not available, or it is after 5 P.M., please send email to the appropriate email address listed below. When reporting any problem via email, be as specific as possible. Be sure to provide the name of the computer, the bench number, and where appropriate, the model number of the equipment being used. Include details of what lead up to the problem encountered, the problem itself, and what you did to try to correct the problem.

Software problems: [cpe\\_help@egr.msu.edu](mailto:cpe_help@egr.msu.edu)

Hardware or problems of unknown nature: [eceshop@egr.msu.edu](mailto:eceshop@egr.msu.edu)

Important note: 100% of the unreported problems remain unresolved.

## **Parts and Hardware**

In addition to the parts cabinet in the laboratory, some items needed for your project are available from the Shop: breadboards, solder, screws, nuts, duct tape, electrical tape, general TTL and linear ICs, IC sockets, diodes, L.E.D.s , oscillators, batteries, fuses, fuse holders, etc. However, other parts will need to be ordered from outside vendors. When requesting hardware and parts from the Shop it is best to have a list in hand before you arrive at the door. The Shop staff will check to see if the items needed are available from the Shop stock room. If the item is not on-hand it will need to be ordered, you should email your parts request to [eceshop@egr.msu.edu](mailto:eceshop@egr.msu.edu). Your request must include the following information:

- Your name and email address
- Team name or number
- Part number (including the package designation on ICs)
- Manufacture name
- Distributor name and telephone number, if known

You should allow one to two weeks for delivery. Some orders arrive sooner, but always plan on a minimum of one week. ECE preferred electronic parts distributors are Allied Electronics ([www.alliedelec.com](http://www.alliedelec.com)), Digikey Electronics ([www.digikey.com](http://www.digikey.com)) and Newark Electronics ([www.newark.com](http://www.newark.com)). Other preferred vendors are MSU Stores, ([universitystores.msu.edu](http://universitystores.msu.edu)), W. W. Grainger ([www.grainger.com](http://www.grainger.com)) and McMaster Carr ([www.mcmaster.com](http://www.mcmaster.com)). Note: when you find that perfect part for your project, check to see if it is available from one of these distributors; if it's not you must provide the name of a distributor where it can be purchased. Failure to provide all necessary information will delay your order. **No order will be shipped Express or Next Day.** International orders will not be processed.

## **Reimbursements**

Brian Wright or Roxanne Peacock, the Shop technicians, must give prior authorization before any reimbursement for parts or supplies will be processed.

## **Additional Hardware Notes**

Digital Cameras are available for loan so that you may document your project. The loan period is 4 hours and you must provide your own 3 ½" floppy diskette. There are no weekend loans and all cameras must be returned to the Shop by 4 p.m. Friday, regardless of the time they were checked out. In addition, the cameras are for use in the Engineering Building only.

Oscilloscope probes are not interchangeable due to the X10 sensing feature built into the probes. Always make sure you are using the correct probes when making a measurement.

All equipment and parts requisitioned from the Shop are the property of the ECE Department and must be returned to the Shop no later than the last day of classes (not the Friday of Finals Week).

### **Software**

Only software currently available on the machines and CPE servers can be used. No freeware, shareware, demo, or evaluation software will be installed on the machines. It is your responsibility to back up your files.

### **Engineering Machine Shop**

You may also find a need to utilize the Engineering Machine Shop. The Engineering Machine Shop is located in room B250 Engineering and has limited hours when their services and equipment are available for student projects. **Safety glasses or goggles are required to work in the Engineering Machine Shop.** It is your responsibility for furnishing your own safety glasses or goggles. Safety goggles can be purchased at the MSU Book Store located in the International Center. Prices range from \$2.99-\$7.99 per pair. There are safety rules that must be followed by all students who wish to use the Engineering Machine Shop. Each individual who wishes to use the Engineering Machine Shop must complete this form. The Engineering Machine Shop has available cutting tools, saws, drills, mills, and a lathe.

### **Engineering Machine Shop Rules**

SAFETY GLASSES with side shields are to be worn at times while in the machine shop. Prescription glasses must be fitted with side shields. There are no exceptions to this rule. Students working in the machine shops must furnish their own safety glasses.

- All jewelry must be removed from hands, wrists, neck and ears.
- Loose fitting clothing or clothing that does not protect the body, legs and feet (i.e. neck ties, shorts, torn pants, tennis shoes, sandals) from hot metal chips, falling tools or parts, are not allowed.
- Reckless behavior will not be tolerated.
- No food or drinks are allowed on the machine shop floor.
- Students will sign in each time they begin working in the shop and record the specific machine, by number, that is being used.
- Tools that are not standard issue must be signed out.
- Students are to check over the machine they are using for proper operating conditions and for proper clean up.
- Before starting work, test to make sure that all emergency shut-off switches and brakes work properly. Check to make sure that chucks, vises, and other fixtures or attachments are secured properly.
- Only ONE person is to operate a machine at a time.
- Students will NEVER leave a machine while it is operating.
- Report all breakage to the instructor so that repairs or replacements can be made.

- Notify the instructor when leaving the shop to take a break, use the bathroom, etc.
- Before leaving the shop, students must thoroughly clean and wipe down each machine they have used and return all tools to their proper location. This includes wiping out the oil that may accumulate on the base of the machine. The floor around the machines are to be completely swept. No tools, such as drills, files, rulers, etc., are to be left out on any machine.
- DO NOT use compressed air to clean or blow chips off machines. Particles can be blown into the face and cause injury. Particles are also driven between the sliding surfaces of the machine causing damage.
- The instructor MUST check the condition of the machine and be certain that all tools specific to the machine are back in the machine cabinet before the student leaves the shop.
- Sign out when you have completed your machine work and the instructor has checked the condition of your machine.
- Steel scrap must be kept separate from all other trash. Scrap Steel and Trash barrels are clearly marked on the barrels themselves.
- Above all, use caution and good sense when in any industrial environment.