What You Need to Know in Order to Utilize

the Varian Physics Student Machine Shop

The Physics Department is fortunate to have a well-equipped Machine Shop that is staffed by the following highly skilled professional Machinists:

Mr. Karlheinz Merkle
Mr. Mehmet Solyali
Mr. Matthew Chuck
Mr. Quang Ho

Before you can utilize the machine shop you must complete the shop course, which is offered once a year. For more information, please check the Machine Shop Course Sign Up Sheet on the Physics Machine Shop web site.

This shop course only gives you the basic foundation for simple machining as well as all the necessary safety procedures for the equipment you will be using. Use only the machines you have been certified to use, and that your Instructor has shown you how to use safely and correctly. Do not use any equipment that you have not been trained to use, or that you do not remember how to use. Feel free to ask for help. This course is not intended to make a professional Machinist out of you; if you need complex parts made, please submit a work order with the Machine Shop.

You may only use the machines in the Student Shop; on rare occasions, we will make exceptions and allow you to use some of the equipment in the Main Shop. Any unauthorized use of machinery will be reason to suspend all of your Shop privileges. The machinists are quite willing to answer any questions you may have, except during lunch from 12:00 until 12:30 pm and during their breaks from 10:00 - 10:15 am and from 03:00 - 03:15 pm.

The use of the Student Shop is only for legitimate University business. Your signature on the sign out sheet certifies that the charges are appropriate and directly beneficial to the Project, Task, and Award indicated.

It is important that you record the time spent using the Student Shop, including any materials you used on the time sheet posted in the shop. The Student Shop Users Fee is stated on the main website, with charges in increments of 15 minutes. Both Shop time and Material charges will be billed monthly and charged to your account.

In order to charge any student shop usage or work order you need prior approval on each account (Project, Task, and Award). Your administrator needs to submit a web authorization form which can be found on the following website.
http://www.stanford.edu/dept/physics/facilities/shop.html

Thank you, Karlheinz Merkle Machine Shop Supervisor
Shop Rules!!!!

The machine shop is a potentially dangerous environment. By following the safety rules and applying a lot of common sense you will be able to safely produce quality machine work. We encourage you to plan your machining tasks before you come into the shop. Think before you cut! We also encourage you to take your time in the shop. You will find that if you work slowly and carefully you will obtain the desired results more quickly than if you hurry. The following is a list of shop rules to help you safely produce machine work of consistent quality.

1. Federal and state laws require safety glasses be worn at all times in the shop area. All corrective glasses with the exception of contact lenses provide adequate eye protection. Glasses must be worn whenever you are in the shop regardless of whether you are working or not. Laser safety glasses and sunglasses are not acceptable safety devices because of their tinting.

2. To safely work in the machine shop, you need to be properly dressed. You must wear closed shoes on your feet to protect you from falling objects and metal chips. Sandals are not acceptable. Also long sleeves must be rolled up and long hair tied up or contained in a cap so they do not become caught in any rotating machinery. Rings should be taken off. Gloves are not allowed to be worn in the shop except for handling dirty or sharp material. They are never to be worn when running any machines. This includes rubber gloves.

3. It is mandatory that a minimum of two people, both having taken the shop course, be present in the student shop at any time in case there is an accident. Be sure that all people you bring in to the shop with you have safety glasses and appropriate shoes, and that they know where the emergency power shutoff switch, the fire extinguisher, and the phone are located. Remind your shop-mates to adhere to all safety rules.

4. Do not walk out of arm's reach of a running machine.

5. The machine shop is not a place to experiment. Since the machine shop is a potentially dangerous environment, no operations that you are not entirely sure will work should ever be tried. If you are not absolutely sure you know what you are doing ask any one of the shop staff.

6. As a user of the machine shop it is your responsibility to immediately tend to any potentially dangerous situation that you come across regardless of whether or not you have caused it. Clean up spilled oil by spreading Oil-Sorb on the spill, and advise Karlheinz immediately so he can arrange for proper disposal.

7. Report any broken or missing tools to the shop personnel so they can be replaced or repaired. Never use anything but sharp, unbroken tools. A dull tool requires higher cutting forces to do the same work as a sharp tool. Increased force causes accidents and damaged work pieces.

8. All work must be securely clamped in the machine before any work is done.
9. Do not grind non-ferrous material on the grinder. It eventually causes the grinding wheel to crack and fly apart. The grinder is for sharpening cutting tools only. Use the belt sander if you want to grind something that is not a cutting tool. When turning the grinder on do not stand directly in front of the wheels, wait until they have come up to full speed. Never ever clean any grinder or sander with compressed air!!!

10. Lathe and drill chuck keys must never be left resting in a chuck.

11. Resist the temptation to pull chips away from the cutter with your fingers. They are sharp and hot. If you must remove the chips use a pair of pliers.

12. Never blow compressed air into a large pile of chips. Use a brush to remove most of the chips then blow. Never blow air towards another worker. Never blow compressed air onto your skin or hair.

13. Do not leave a machine set up and unattended for any longer than half an hour without the consent of the shop supervisor. If left for longer the set up will be torn down when the machine is needed.

14. All shop users are responsible for cleanup as described below.

**Shop Clean Up Policy**

At the end of your work time you are expected to clean up the machines you worked on including the area around them, the base and the chip pans. On days when there is no janitorial service available you also must sweep the floor.

Each work area must be left clean, so if you drill a hole on the drill press, and then go to use the mill you must clean the drill press first, before you use the mill.

After using a machine, tear down all setups and return the machine to its standard setup. Milling machines should be left with a vise securely mounted on the center of the table.

Chips should be removed from the t-slots of the table. Lathes should be left with an empty collect chuck or three-jaw chuck on the spindle. Nothing should be in the tailstock and the cutting tool should be removed from the tool post.

Brush all of the chips off the machine and place them in the trash. Do not use compressed air for this. Once most of chips are removed, go ahead and blow the once you missed on the floor. When the chips are removed, wipe all oil and dust from the machine with a rag. Be sure to clean the chip pan on the lathe and the base of the mill. Then sweep the floor around your work area and throw sweepings into the trash.
If the supervisor determines that any person neglected to clean a machine or shop area that he or she was using, the user must immediately return and perform the required cleanup to the supervisor's satisfaction. Otherwise he/she may lose shop privileges.

Karlheinz Merkle, shop supervisor, 3-2679