EML2322L – MAE Design and Manufacturing Laboratory

TA STUDENT SHOP ASSESSMENT

Name: _____ Grader's Initials: _____

Description: This assessment gages your understanding of the material covered in the following Student Shop resources: Student Shop Instructions and Procedures, Student Shop Use Guidelines, Common Tools for Working with Ferrous Metals, and Student Shop Cabinet Contents. **Please correct any T/F questions which are FALSE** and ask Mike or any senior TA questions you have regarding this material. Each section contains hyperlinks to the document where the answers can be verified.

1. The MAE Student Shop is available for use by students from any department. T / **F**
2. Students can use our tools to cut ferrous materials in the student shop as long as they are careful and take light depth cuts. T / **F**
3. If a student breaks a tool and notes it in the broken tooling list, it's okay if they replace it with a tool of lower quality, as long as they replace it. T / **F**
4. Never exceed your level of comfort / experience when supervising the Student Shop; in other words, understand some jobs are just not appropriate for our resources and experience. **T** / F
5. You are responsible for the cleanliness of the shop and are expected to ensure the students leave it clean and organized at the end of each lab. **T** / F
6. All rules enforced in DML are enforced in the Student Shop (i.e. long pants, proper shoes, safety glasses, no jewelry, long hair tied back, etc.), regardless of why a student is in the Shop. **T** / F
7. There will be times when the shop feels crowded and you need to tell students to wait outside until someone leaves and you can help them. There will also be times when you can't help everyone at once and you will need to tell students to stop and wait for your assistance before continuing. **T** / F
8. All students must sign the Usage Log / Roster hanging on the main door so we can track facility use statistics and ensure only MAE students are using our shop. **T** / F
9. Students are allowed to reserve a limited number of equipment use blocks during each week, but are not allowed to sign up on the following week's equipment reservation schedule unless they were not able to sign up for the current week. **T** / F
10. If students have no drawing(s), they cannot work in the Student Shop. Drawings don't have to be computer generated, but they do need to be legible and contain enough information so as to not waste time deciphering them or delaying work due to omissions in them. **T** / F
11. If a student's low level of proficiency requires excessive attention and keeps you from effectively supervising the others, kindly ask them to stop working and to sign up for an equipment training session on the Machine Training Signup Sheet. **T** / F
12. When work is slow, Maintenance Checklist tasks should be completed and marked off. **T** / F
13. It's okay to let any student use a boring bar on the lathe. T / **F**
14. It's okay to let any student use a part-off tool on the lathe; and while doing so, they should be encouraged to use the power feed as well. T / **FF**

15. Drills larger than 1/2" should be clamped in collets, not drill chucks. **T** / F

16. Materials thicker than 3″ should be cut on the Marvel during TA hours or by appointment. **T** / F

17. Students should never drill holes larger than ½″ on the drill press. **T** / F

18. If a DRO stops measuring/displaying properly, make sure the power and encoder cables are fully seated into their sockets, turn DRO off and back on, reference Troubleshooting DRO Readout Errors handout, and if that doesn't provide a solution then ask Mike. **T** / F

19. Students must provide taps under #6 or M4. **T** / F

20. Do not give students carbide or 4 flute endmills (these are for TA use only). **T** / F

21. The upper guide and guard of the Roll-In bandsaw should be set to within ¼″ of the workpiece. **T** / F

22. NEVER cut materials that might be hardened, such as steel alloys, files, hardened guideways, stainless steel, etc.; any material than cannot be cut easily with a standard hand file should never be cut in a bandsaw; use an abrasive cutoff saw instead. **T** / F

23. Which of the following are not available and should not be asked for by students:
    - **a.** raw materials
    - **b.** sandpaper
    - **c.** fasteners
    - **d.** adhesives (this includes tape, JB Weld, and Loctite)
    - **e.** TA(s) to make your parts
    - **f.** last minute hopes and dreams

24. If a student has not completed machine training, a TA is NOT responsible for training at the time (s)he enters the Student Shop; machining training will be conducted in groups of three and (s)he will be required to sign up and wait to be e-mailed concerning an appropriate time. **T** / F

25. The lathe uses **WNMG 32X** style indexable tungsten carbide cutting inserts. T / **F**

26. The **X** in the style description refers to the corner radius on the cutting insert. 43**1** means **1**/64″ corner radius; 43**2** means **2**/64″ (or 1/32″) corner radius. **T** / F

27. Larger corner radii are better for finishing passes and smaller corner radii are better for general turning/roughing operations. T / **F**

28. Alternatively, students can purchase ***single point carbide cutting tools***, which have a small ground piece of tungsten carbide brazed to a square steel shank. When ordering these, specify right hand cutting direction and a shank height of ½″ or less. These tools are typically cheaper than buying an insert, but they only have one cutting edge compared to three or six for the WNMG inserts mentioned above. **T** / F

29. The lathe uses 0.375″ wide ***GTN-3*** style tungsten carbide parting / grooving inserts. T / **F**

30. When cutting ferrous metals students should order ***4 flute carbide endmills*** (as opposed to 2 flute high speed steel for cutting non-ferrous materials). **T** / F

31. When threading ferrous metals students should order 4 flute high speed steel or cobalt taps (NOT the cheaper and weaker carbon steel taps). **T** / F

32. When creating pipe threads in ferrous materials, students should order both an ***interrupted pipe tap*** and a ***tapered pipe reamer*** for the size pipe thread you desire to create. Interrupted thread pipe taps have every other thread relieved (i.e. removed) so the cutting torque is much lower, which is important for tap life and ease of use, since you are rotating the tap by hand. **T** / F

33. When cutting ferrous metals you need a bandsaw blade with a relatively high number of teeth per inch (TPI). **T** / F

34. List the cabinet letter in which each item is located after verifying with your own eyes. Clearly denote any items you could not find with the assistance of an older TA.

Item	Cabinet	Item	Cabinet
1-2-3 Blocks		Hole Saw	
4-Jaw Chuck		Inserts	
5C Collets		Jack Stands	
Allen/Torx		Jigs	
Annular Cutters		Lathe Drills	
Bandsaw Blades		Layout	
Boring Bars		Measurement	
Boring Head		Metric Taps	
Box Cutters		Mill Chuck	
Centers		Oil	
Clamps		Parallels	
Cleaners		Plastic Bags	
Collet Chuck		Pliers	
Collets		Reamers	
Corded Drill		Replacement Drills	
Dial Indicators		Safety Glasses	
Digital Calipers		Scissors	
Dremel		Screwdrivers	
Drivers		Sharpies	
Ear Plugs		Shop Rags	
Edge Finders		Sockets	
Emergency Kit		Step Drills	
Endmill Adapters		Tape	
Endmills		Taps	
Extra Collets		Tool Holders	
EZ-Tram		Trash Bags	
Files		Vise Jaws	
Gage Pins		Wax	
Gloves		Workholding	
Hacksaw		Wrenches	
Hammers		Zip Ties