Lathe Training Packet

Introduction:

Lathe training is required for using the Engine Lathes in the Olin Machine Shops. The training consists of a set of background reading, a test about the reading, a training session with an instructor, and a test piece. The instructor led portion is done in groups of three in two three hour sections of time and cannot be scheduled without completing the background reading and passing the test. The training is not complete until one makes the test piece. This training packet is the record of your training status so keep track of it until you have completed the training, upon which it will be kept by the shop as a permanent record.

1) Pick up training packet (that is this packet)
2) Do the readings
3) Complete the reading test
4) Add your name and availability to the cue to be trained (cue is physically located on a poster outside the shop)
5) Be scheduled for 2 consecutive training session (we will schedule training in groups of 3 once enough people have completed the reading)
6) Receive training instruction from a shop instructor (two 3hr sessions) , bring this packet to your training
7) Finish your test piece within 3 weeks of your first training session
8) Sign Machine Training Acknowledgment Sheet

Completion Checklist:

	Instructor's initials	Date
Completion of reading test		
Completion of training session		
Completion of test part		
Signed Machine Training Acknowledgment Sheet		

Readings:

The readings are pulled from *Machine Shop Practice* volume 1 by K.H. Moltrecht and the *Machinery's Handbook*, 26th Edition. These books are on reserve in the library, or a scan of the appropriate pages can be found in P:\Machine Shop Share\Training. Please skim the text and study the pictures of the following sections related to the lathe and operations covered in lathe training. The readings are designed to establish a foundation that can then be built upon during the instructor lead portion. The reading and test are estimated to take 1-2hrs.

Engine Lathe Construction	pg 139-160
Single-Point Cutting Tools	pg 161-213
Tapping	pg 96-100
Allowances and Tolerances for Fits	MHb: pg 621-641

Test Instructions:

Skim all of the readings before starting the test. Please attempt to answer all of the questions in a closed book environment, and then using a different pen color check your answers and answer unanswered questions. You will need correct answers to all of the questions before you can schedule a training session with an instructor.

Reading Test:

1) How many axes does a manual lathe have?
   a) What are they labeled
   b) Sketch their orientation and positive direction on the machine?

2) Explain facing operation on a lathe?

3) Explain profiling operation on a lathe?

4) List the necessary steps to set up a lathe cutting tool to accomplish both profiling and facing on the stock outer surfaces. Sketch the tool profile (from the top) such that facing and profiling can be accomplished without reorienting the tool. NOTE: You only need to setup the tool, not use it in this question.

5) For the setup above, should the lathe tool be biased above or below center?

6) For the setup in question above, which direction should the tool post travel (give your answer WRT the machine coordinate system):
   a) For facing?
   b) For profiling?

7) Headstock from the tailstock, which direction must the spindle rotate for a front tool cutting setup?

8) When a noticeable “squeal” is emitting from a part being turned, what is the most likely cause and how can it be remedied?

9) What type of carbide insert can be used to cut;
   a) Aluminum/Brass

   b) Steels

10) What is the function of a center drill?

11) What is the difference in form and use between a plug and bottoming tap?

12) When threading a shaft, what size should the shaft diameter equal?

13) When is it ok to remove your safety glasses in the shop?

14) When is it appropriate to work alone in the shop

15) When is it ok to run a machine with two operators?

16) When is it ok to leave machinery running unattended?

17) What are the mini-shop hours of operation?

18) What is the emergency assistance phone number at Olin?

19) Are gloves allowed to be worn on while working on the lathe?

20) When can compressed air be used to clean machinery?

21) When operating a lathe, which hand should be used to apply cutting fluid w/a brush?

22) When is it permissible to slow down the rotation components of a machine with one's hand?