This syllabus is intended to aid instructors in providing training for this tool, and for quick reference by existing users. It is not intended to teach you the tool by itself.

1. Safety

1.1. Awareness of risks

- Risks inherently associated with machining
- Direct cutting risks (including from non-spinning tools!)
- Hair, clothes, etc tangling in spindle/tool
- Crush risks from moving axes
- Flying chips
- Parts flying on workholding failure
- Sharp edges on stock, workpieces and chips
- Hot tools and workpieces after cutting

1.2. Use of safety measures

- Safety features of the machine
- Emergency stop button
- Protective cover
- Clothing and use of PPE
- Safety goggles
- No gloves
- Ear protectors for noisy jobs
- Aprons, boiler suits etc to protect clothing
- No ties / scarves / jewellery / etc
- Keep bed clear
- Keep foot on brake at all times

1.3. Training

Start with a safety briefing - go through all the points above, in front of the machine.
Main hazards/risks should also be on warning signs / posters in the tool area as a reminder.
During subsequent training, be ready to prompt if any safety measures or considerations seem to have been forgotten by the trainee.

1.4. Evaluation

The trainee must be able to identify risks associated with the machine and the safety measures that should be used.
The trainee must be observed to routinely use safe working practices when working without prompting or reminding.

2. Basics

2.1. Parts and Axes

- Headstock is where the part is turned from
- Bed is the portion which moves when you turn the big wheel
  - Slides are mounted on the bed and controlled by little wheels
- Tailstock is piece at far end, used for securing work or drilling
- Z axis is parallel to work
- X axis is perpendicular to work

2.2. Turning on & startup

- Switch on control box
- Ensure lathe is in gear and autofeed is disabled

- Manually move tool away from chuck
- Release emergency stop switch

2.3. Training

Start by demonstration. Go through the process of turning on the machine and making it ready for use, talking the trainee through each step and the reasons for it.

Next, shut the machine down and ask them to repeat the process. They will probably need lots of prompting and help, this is fine.

The trainee will get further practice through routine use as they go through the training process. Be ready to prompt and remind as needed.

2.4. Evaluation

The trainee must be able to set up the machine correctly without assistance or prompting, regardless of the state they find it in. They should be able to identify the types of tool and their uses.

3. Manual operation

3.1. Securing work

- Use the three-jaw chuck
- Secure other end of workpiece with tailstock.

3.2. Tool movement

- Move the Z axis
- Move the X axis
- Move one axis at a time
- Autofeed

3.3. Gearing

- Three big levers control spindle (and autofeed) speed
  - Refer to chart to determine relative speeds
  - Do not rely on numbers being accurate!
- Forwards/back on table feed
  - Round black knob should be as far clockwise as possible (for autofeed left and in) or counterclockwise as possible (for right and out)
  - Machine must be fully stationary before changing orientation of knob
- Fast/slow table feed
  - Threading levers in bottom left.

3.4. Loading and unloading tools

- Lock toolholder in table
- Verify height of tool
  - Close chuck jaws and bring cutter to near centre
  - Tool should be in line with centre of chuck
- Choosing tool type
  - Blunt HSS is *parting* tool for parting off
  - Small gold diamond is *facing* toolTODO: fill in other tool types
- Tools can be used in unconventional ways
  - How could the facing tool be used to decrease diameter?

3.5. Training

Set up a piece of cylindrical stock in the three-jaw chuck. Secure it with the tailstock, leaving enough room on the Z axis to move the table until the tool is clear of the workpiece. Install the parting tool and have the trainee part off 60mm of the workpiece, then back off the tailstock and remove the cut piece.

Have them install the facing tool and neaten the cut edge of the workpiece. Discuss feeds & speeds - faster spindle means faster movement but less clean cut.

Have them remove the workpiece in the chuck and replace the 60mm piece they made. Introduce autofeed - have them align the facing tool with te rough face and use autofeed to face it. Have them flip the workpiece and face the other end.