

Wood Turning Basic Class

Purpose of the Class:

The student will gain a basic understanding of wood turning and the associated tools used. Particular emphasis will be placed on the development of safe and efficient work habits.

Class Objectives:

Upon Completion of this course the students will have the knowledge and skills required to:

1. Demonstrate the proper techniques for using wood turning tools.
2. Safely set up and operate a wood lathe.
3. Demonstrate basic wood turning operations in a safe manner.
4. Complete a basic spindle turning project.

Class Outline:

- Week 1 **Introduction**
 - Introductions
 - Class Overview
 - Identify the parts of a wood lathe
 - Motor
 - Tensioning handle
 - Head stock assembly
 - Spindle
 - Spindle hand wheel
 - Knockout bar
 - Pulleys
 - Drive belt
 - Drive accessories
 - Spur center
 - Faceplate
 - Scroll chuck
 - Bed ways
 - Tail stock assembly

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- Quill feed wheel
- Locking lever
- Live center
- Dead center
- Power switch
- Tool rest assembly
 - Tool rest holder
 - Tensioning lever or lock
 - Tool rest
- Identify wood turning tools that will be used in the class
 - Whatever is in the tool kits that we bought
- Define common wood turning terms
 - Catch
 - Spindle turning
 - Face plate turning
 - Bevel
 - Bead
 - Cove
 - Green wood
 - Fingernail grind
 - Parting off
 - Jacobs chuck
- Video – Turn Around by Jimmy Clewes
- **Week 2 Safety, Sharpening and Beginning to Turn!**
 - **Safety**
 - Safety rules
 - **EYE PROTECTION!**
 - No loose fitting clothing, jewelry or long hair near the moving parts of the lathe
 - Stand out of the firing line of the wood when starting the lathe.
 - Never place hands where they can be pinched between the tool rest and the work piece

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- Lathe speed must be compatible with the size and weight of the work piece
 - The larger or more out of balance the piece, the slower the lathe must be set.
 - **Always err on the slow side**
- The tool must be placed on the tool rest before touching the spinning wood. It must remain there during the whole cutting operation
- The bevel of the tool should rub the wood behind the cut. (Basic rule... There are more advanced cuts and scraping cuts where the bevel doesn't touch)
- The part of the tool edge doing the cutting must be supported by the tool rest.
 - Failure to obey this rule will almost always result in a catch!
- Always cut with the wood's grain (cut downhill)
- Scrapers must be presented to the wood in the "trailing mode", with the handle higher than the cutting edge
- ***Compliance with these rules makes it unlikely that you will be seriously injured.***
- ***Sharpening***
 - Wear eye protection when using the grinder
 - The longer (more acute) the angle on the tool, the sharper it will be; but, the quicker it will dull
 - The shorter (more obtuse) the angle, the duller it will be; but, it will last longer.
 - We try to find a workable balance between the two...
 - Soft woods require very sharp tools to get a satisfactory cut. Dull tools will tear the grain instead of cutting it. Most hardwoods aren't quite as fussy, but you will still get a better finish with sharp tools
 - Approximate sharpening angles:
 - Roughing gouges - 45°
 - Spindle gouges - 35°
 - Skews and parting tools - 25°
 - Bowl gouges - 55°
 - Scrapers - 80°
 - Grinding
 - Bevels

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- ONE bevel (or facet) is the goal. Draw examples on the chalkboard, and/or pass around tools that are properly and improperly sharpened.
- You can see light reflect from the sharpened edge of a dull tool. You can't see the point of a tool that is truly sharp.
- Methods of grinding
 - Freehand
 - Takes considerable practice.
 - It is the fastest way to sharpen a tool – AFTER you get the hang of it.
 - Adjustable tool rest
 - Moving the grinder's tool rest to a new angle for the tool being sharpened
 - Great way to sharpen single angle tools like a skew, scraper, parting tool or roughing gouge.
 - Sharpening jigs i.e. Wolverine
 - Makes getting a single bevel on the tool much easier
 - Works well creating “fingernail grinds” on a gouge
 - Novices can get very sharp tools with just a few minutes practice
- Honing
 - It is not normally necessary to hone lathe tools. They will generally perform well directly from the grinder
 - Honing can leave the edge sharper than the grinder alone, it is sometimes beneficial for finishing cuts.
 - Is an excellent way to touch up tools between trips to the grinder
 - Removes MUCH less steel than the grinder does
- Heat
 - Heat is the enemy!
 - If the end of a carbon steel tool changes color, it will no longer hold an edge (without re-tempering)
 - Use a very light touch when grinding tools and keep the tools moving on the wheel to avoid heat buildup.

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- Quench the tool in water if necessary to cool the tool cutting edge.
- Don't over grind the tool...stop when it's sharp!
- Week 3 **Spindle Roughing and Straight Cuts**
 - Find the centers – draw diagonals from the corners of the ends on the work piece
 - Place the drive center
 - Seat the drive center by placing it on the end of the stock and giving it a sharp blow with a mallet or a piece of wood.
 - Don't use a hammer as it will mushroom the end of the drive center and it won't seat in the chuck after that
 - Install the drive center into the headstock after creating an indentation in the wood
 - Mount the work piece on the lathe
 - Place the wood up to the drive center aligning it so the drive center sits in the marks made from the step above
 - Bring the tail stock up to the wood and place the point of the live center into the center of the stock
 - Extend the quill until the point of the live center enters the center of the work piece
 - Only tighten the quill enough to hold the wood, too much pressure will damage the headstock bearings over time
 - Lock the quill after the tail stock is placed properly.
 - Position the tool rest
 - The height of the tool rest isn't critical during spindle turning, but it should be somewhere near the center of the work piece, i.e. the top of the tool rest should be even with the points of the live and drive centers
 - The tool rest should be as close as possible to the work piece while still allowing it to turn.
 - In most cases the tool rest will be longer than your work piece, position the rest where you want to cut.
 - Ensure that there is at least $\frac{3}{4}$ " of the rest hanging out past the proposed end of your cut...you don't want the tool to fall off the tool rest while you are cutting
 - Holding the tool
 - Demonstrate how to hold the tool for:
 - The overhand cut

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- The underhand cut
- Hand placement
 - The front hand braced on the tool rest
 - The rear hand holding the tool and braced against the body
- Use the body to control the tool
 - Discuss proper stance, balance and movement
 - Demonstrate how to use your whole body to move the tool and get smooth fluid motions/cuts
 - Using just the hands and arms can result in a uneven or rough looking cut
 - Keep your elbows tucked in against your body
- Start roughing cuts
 - Demonstrate and remind the students of the following:
 - The tool must be ON the tool rest before the cutting edge touches the wood
 - Allow the shaft of the tool to rub on the wood
 - Slowly pull the tool handle back away from the work piece until the bevel of the cutting edge is rubbing on the work
 - Gently lift the back hand until the tool starts to cut.
 - The higher the back of the tool is lifted the deeper the cut will be.
 - Turn the tool slightly in the direction that you want to cut
 - Gently guide the tool in the direction of the cut.
 - Cut small portions of the wood at first – approximately 2” at a time
 - Work from higher to lower (with the grain)
 - Show them how to check for roundness
 - Placing the tool shaft on the work piece
 - Feeling the back of the work piece
 - Sound/feel of the cut (vibration)
 - Let the students rough out two or three cylinders
- **Week 4 Coves and Beads**
 - Cove
 - Demonstrate how to cut a cove

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- Student Practice
- Bead
 - Demonstrate how to cut a bead
 - Student Practice
- Week 5 & 6 **Make Pens**
 - Demonstrate how to make a 7 MM pen
 - Refer to instructions for the pen kit being made. Some examples can be found at:
 - <http://www.pennstateind.com/library.php>
 - http://www.bereahardwoods.com/price/kits/series10_1.cfm
 - http://www.woodturnerscatalog.com/store/util/turning_courses?
 - Student Practice
 - Class critique