



Learning Woodwork

Project I Report : Summer Internship at Silpa-sadana, Sriniketan

Guided by

Prof. Deb Kumar Das, Silpa-sadana

Submitted by

Patric john 146130005

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Declaration

I hereby declare that the contents in the report entitled “Learning Woodwork” submitted by me represents my own ideas & in my own words and where other ideas and words have been included, I have adequately cited and referenced to the original sources. I also declare that I have adhered to all the principles of academic honesty and integrity and have not misinterpreted or fabricated or falsified any fact/idea/data in my submission. I understand that any violation of the above will be cause for disciplinary action by the institute and can evoke penal action from the sources which have thus not been properly cited or from whom proper permission has not been taken when needed.

Name of student: Patric john

Roll no : 146130005

Signature:

Date:

Approval

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Guide

Internal Examiner

Prof. Deb Kumar Das, Silpa-sadana

Date:

Abstract

This report is part of Project I-summer internship in Silpa-sadana, Sriniketan. The duration of summer internship was around 1 month. The objective of the internship is to learn something new which supports my design knowledge and to apply what i have learned in the field of design. I worked in wood and learned the basics of wood working. I was also able to learn about wood and the hand tools for woodworking which helped me alot in learning woodworking. I focused a bit more on turning wood. I made a few flower vases and some other products. Well after one month of summer internship the experiences which I gained through it helped me to create a better sense towards crafts and design. Also the learning about the wood and understanding about other crafts in Silpa-sadana was very useful and informative. I further look forward in continuing woodworking and would suggest anyone in design/arts/architecture field to have a first hand experience in crafts from this place.

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Chapter 1

Introduction to crafts : Silpa-sadana

Before going to talk about crafts in Silpa-sadana and sriniketan it is important to know about the background and influence of Calcutta and people who influenced crafts & silpa-sadana like Rabinthranath Tagore & other distinguished people.

Kolkatta

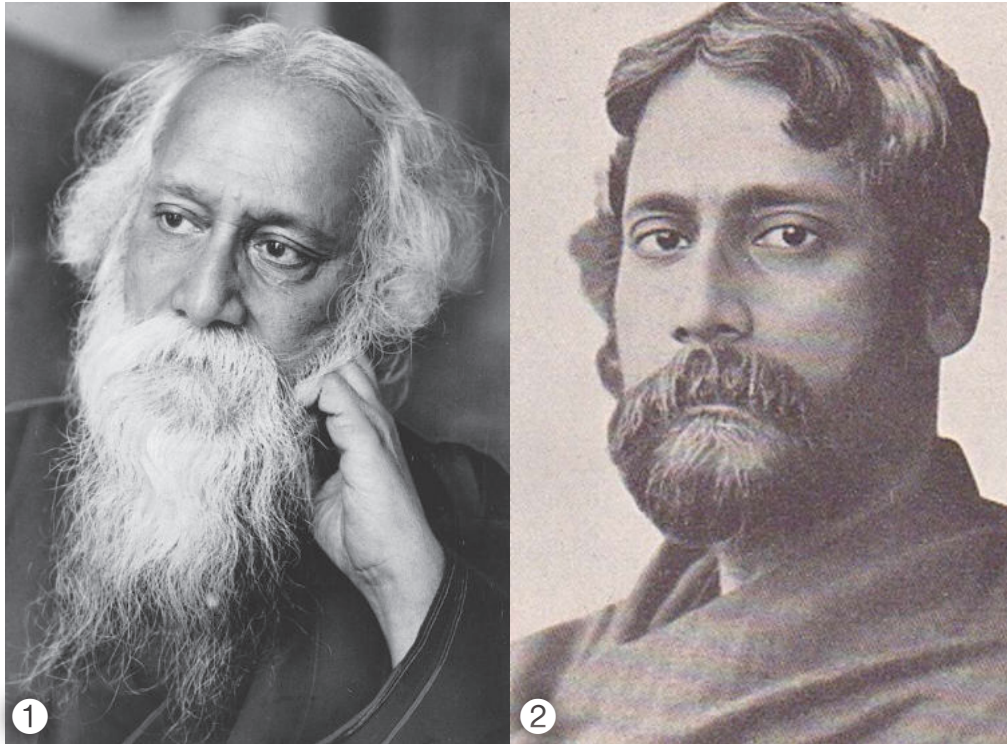


Kolkatta, which is the capital of West Bengal, is one of a kind metro city in india with a rich cultural heritage. If somebody travels by train he has to reach Howrah station, which is one of the busiest and biggest and oldest railway station in India. Howrah station is situated on the banks of Hooghly river. The vast station has about 23 platforms. Kolkatta has many historically and culturally important places. I visited a few places. Victoria memorial, St.John's cathedral, Science city, North calcutta, are some. The street foods of calcutta has a great variety. Kolkatta still retained many of its old style buildings and some are even recognized as heritage buildings. The view from the Hooghly river is something different, an unforgettable memory.

Kolkatta to Santiniketan

We reached there in the morning. Had our breakfast from the railway station and within the available time we walked around the station. There is a good view of Howrah bridge (Rabindra setu), named after the Great Rabindranath tagore. After that we reserved for Shantiniketan express and started our journey. Through the window of the train we saw the places and people. Suddenly a soothing voice of Baul singers broke through the silence inside the A/C chair car. The place became lively in seconds. More singers were followed one after other. I never heard such music and felt such an experience before. The baul singers had a very different pattern from other normal singers who comes in trains and buses. It took around 2-3 hours to reach santiniketan.

1. Howrah bridge
2. A rickshaw-wala in calcutta
3. Vidyasagar setu
4. statue of Durga devi
5. kolkatta street food
6. busy street in Kolkatta



Rabindranath Tagore

Rabindranath Tagore (7 May 1861 – 7 August 1941) was a Bengali poet of India. He was also a philosopher and an artist. In 1913, he won the Nobel Prize in Literature, the first Asian to win this prize. He was popularly known as Gurudev.

His works greatly influenced the people in and around santiniketan. His power and influence brought many eminent people to the place. There is no other person who is more influential than him in shaping the village and surrounding areas.

Santiniketan

Santhinikethan is a small town near Bolpur in the Birbhum district of West Bengal, India, roughly 160 kilometres north of Kolkata (formerly Calcutta). It was established by Rabindranath Tagore. Bolpur railway station is the nearest station if you are travelling by train. From Bolpur one need to catch a “tuk-tuk” to santhiniketan. The Baul singers which you saw earlier in train can be seen around the railway station, some are going some are coming. Since I am from southmost part of India I felt very much difference in the style of people. In santhiniketan especially the part where visvabharathi is located is green, are covered with lots of trees. The arts college of visvabharathi, Kala Bhavana is a wonderful campus with many paintings, murals and sculptures. In the campus the ashrama area old “class-rooms” under tree can be seen. There are houses of Rabindranath Tagore and a museum. There is a handicrafts market just near to the campus where they sell all the products which are made in and around campus.



1. Rabindranath Tagore (when he was old)
2. Rabindranath Tagore (when he was young)
3. patha bhavana
4. Upasana Griha, Prayer Hall,

Mela- “Khoai Boner Onyo Haat”

(a different haat/ marketplace of the Khoai forest)

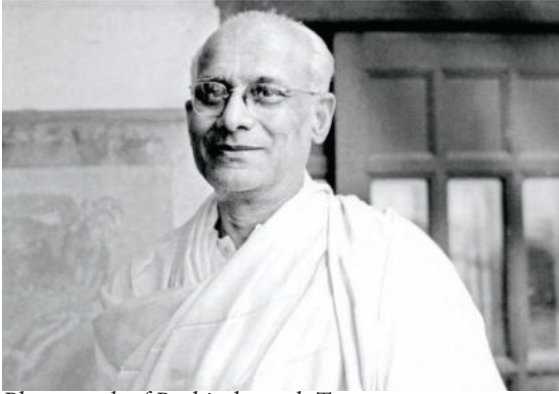
The woods of Shonajhuri in Santiniketan is the location. About 12 years back a group of artists initiated a small fair or haat (marketplace) for the cause of local rural craftsmen, where they could showcase their works to outside world. Most important, a path was thrown open for artisans to sell art without the interference of middlemen. The fair is conducted weekly, on Saturdays afternoon till sunset. The people sell all kinds of crafts and products which are made by them. There are all sorts of things like woodcrafts, carvings, paintings, fabrics and clothes, bags of various materials, leather products, even homemade food are also available. Along with the performance of Baul singers and dancers the place transforms into a big merry gathering.



1. A craftsman in Saturday market
2. Leather bags in Saturday market
3. handicrafts like wood, bamboo, and other products.
4. Textiles in market

Silpa-sadana, Sriniketan

Rathindranath Tagore



Photograph of Rathindranath Tagore.

SILPA SADAN

(A Centre for Rural Craft, Technology & Design)

Silpa-Sadana, a department under Palli Samgathana Vibhaga of Visva-Bharati was established in 1922 by our profound Gurudeva at Sriniketan with a view to promote the craftsmanship of the nearby villagers.

As Tagore the zamindar went to collect the annual tax from the villagers he saw the poor condition of the villagers. Tagore thought of bringing up the life of people by teaching them the crafts for that he started the place with the help of artists and craftsmen.

Craft sectors had been given the top most priority. Later the great son of the great poet, Rathindranath devoted his entire life to turn his father's dream into reality through his efforts. To fulfil this mission, he was backed by the active assistance from his wife, Pratimadevi, who stretched her arms in this noble venture. Through their continuous research and endeavour, Silpa-Sadana, in due course, became the Cottage Industries Training Centre and the produce from its extension wing emerged out as the trend setter in design throughout the country.



Photograph of Emporium, silpa-sadana.



Fig.1 Silpa-sadana and the different section under it

Chapter 2

Introduction to Basics and types of woodwork, learning the usage and techniques of woodwork tools

Wood has always been an amazing material and the woodworking was very wonderful to me . wood is used extensively for furniture, Doors windows and many other uses. Also wood is used for small crafts and tool handles and cutlery, such as chopsticks, toothpicks, and other utensils, like the wooden spoon.

Growth rings

The circular rings which can be seen on the wood is called the growth rings.

Drought, excessive rain, fire, insect plagues and disease epidemics, injuries, thinning, air pollution, all leave their mark on a tree's annual growth rings.

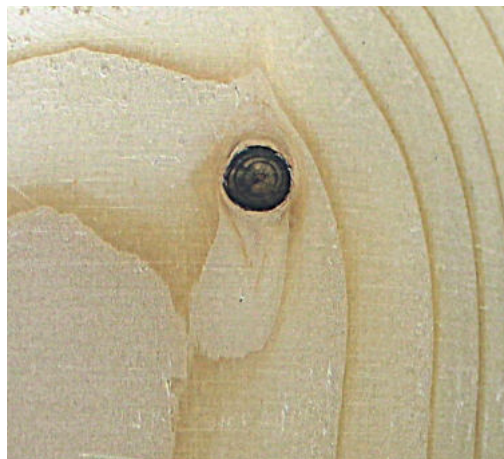
Photograph of Growth rings



Knots

A knot is a particular type of imperfection in a piece of timber, which reduces its strength, but which may be exploited for artistic effect. In a longitudinally-sawn plank, a knot will appear as a roughly circular “solid” (usually darker) piece of wood around which the roughly parallel fibres (grain) of the rest of the “flows” (parts and rejoins).

Photograph of Knot (in black colour)



Heartwood and sapwood

Sapwood is the living, outermost portion of a woody stem or branch, while heartwood is the dead, inner wood, which often comprises the majority of a stem's cross-section. You can usually distinguish sapwood from heartwood by its lighter colour.

But, colour in wood can be very misleading; not all heartwood is dark and not all dark colour wood is heartwood. And, the relative amounts of sapwood and heartwood in any stem can vary greatly among individuals, species, and growing conditions.

Wood warping

Wood warping is a deviation from flatness in timber as a result of stresses and uneven shrinkage. Warping can also occur in wood considered “dry” (wood can take up and release moisture indefinitely), when it takes up moisture unevenly, or - especially - is allowed to return to its “dry” equilibrium state unevenly, too slowly, or too quickly. Many factors can contribute to wood warp; wood species, grain orientation, air flow, sunlight, uneven finishing, temperature - even cutting season and the moon's gravitational pull are taken into account.



Photograph of different types of wood warping

Hard and soft woods

There is a strong relationship between the properties of wood and the properties of the particular tree that yielded it. The density of wood varies with species. The density of a wood correlates with its strength (mechanical properties). For example, mahogany is a medium-dense hardwood that is excellent for fine furniture crafting, whereas balsa is light, making it useful for model building.

It is common to classify wood as either softwood or hardwood. The wood from conifers (e.g. pine) is called softwood, and the wood from dicotyledons (usually broad-leaved trees, e.g. oak) is called hardwood. These names are a bit misleading, as hardwoods are not necessarily hard, and softwoods are not necessarily soft. The well-known balsa (a hardwood) is actually softer than any commercial softwood. Conversely, some softwoods (e.g. yew) are harder than many hardwoods.

Hardwood or softwood

Ensure first that it is actual wood

- Check for the end grain.
- Ensure whether it is veneered or not.
- Check whether it is painted or printed to look like wood.

Look at the grain colour

- Check whether the colour is due to staining or natural.
- Try to sand or plane the wood to see its natural color

Look at the grain pattern.

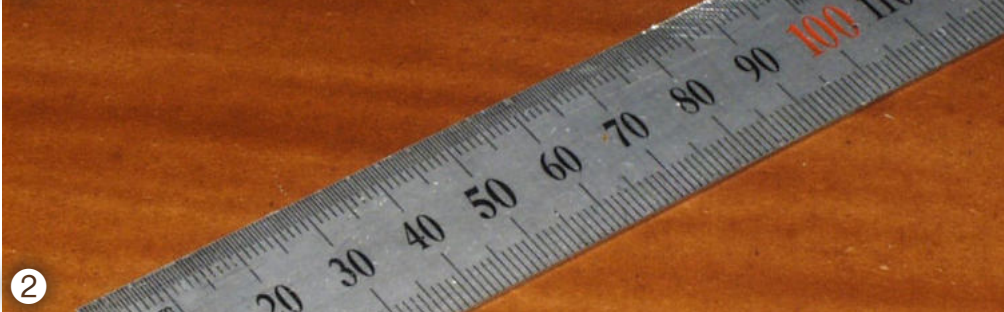
- Does the wood have an open or porous structure

Consider the weight and hardness of the wood

- Check the weight according to the proportion

Tools of woodwork

Hand tools



Measuring & marking

1. *Measuring Tape*
2. *Steel ruler*
3. *L square*
4. *Mortise gauge*
5. *Divider Calipers*



Though power saws are fun, there are times where they have much power, not enough precision, or are too unwieldy or inconvenient for a cutting job. When that happens it's time to reach for the hand saw.

Just because they're muscle-powered doesn't mean they have to be a pain to work with. A correctly chosen, well maintained hand saw can be a downright pleasurable to use.

Even though hand saws look pretty straight-forward, there are few details to know before choosing one.

Bigger teeth cut faster, but because they remove more material with each pass, sometimes more than its made to cut. If you're having a hard time starting a cut or getting your saw through your material, try a blade with a higher tooth-count. Trying to push (or pull) a coarse saw through a hard material will not only wear you out, but can damage the saw. Coarser blades also mean rougher cuts. If you need a smooth finish, user a finer blade, though it will take longer to cut.

Use light pressure. Start slow and let the saw to do the work.

- Don't twist the blade. Keep it perpendicular to your work.
- Use as long of strokes as possible. This will help you make straighter, smoother cuts, will make the blade last longer, and help the blade remove saw-dust efficiently.
- Clamp your work securely and support it well. Double check the area behind the material so that you don't saw into anything else you might regret. Be sure to remove any nails or staples that might be along your cut line.
- Keep your blades sharp and true. Before you start sawing, sight down the blade to make sure it is straight, flat, and none of the teeth are bent too far from the center. Sharpen or replace dull or bent blades.

6. Hand saw with wooden handle

7. Hand saw with plastic

8. Tenon saw



JACK PLANE: This is the steel equivalent of the wooden block plane. It has a steel body and because it is heavier than the wood block plane it is easier to hold down on the surface of the wood being planed. It is used to plane longer pieces of wood.

SMOOTHING PLANE: A shorter version of the steel jack plane. It is used for general work such as smoothing short pieces of wood. It is lighter and smaller than the jack plane

When I tried to use smooth or jack plane for the first time it was difficult to plane a surface accurately or smoothly. The plane tends to stick or to dig into the wood surface with the result being a damaged surface. after i tried a few basic rules are followed this technique can be mastered.

BASIC GUIDANCE ON THE USE OF THE PLANE

1. The wood must be placed level and firmly in the vice.
2. Always plane in the direction of the grain. Examine the wood carefully, it may be obvious which way the grain is flowing.
3. If the plane sticks whilst in use, turn the wood the opposite way round in the vice. Now the grain may be pointing in the right direction.
4. Rub a little candle wax on the bottom of the plane. This will help the plane glide across the surface of the wood.
5. Make sure that little of the blade is sticking out off the bottom of the plane. Too much of the blade will make using the plane very difficult and it may damage the surface of the wood.
6. Always place the plane at the end of the piece of wood and push it firmly across the entire length, without it lifting off the surface. Lift the plane back to the starting position. Pulling the plane back along the wood surface will 'blunt' the blade quickly.
7. Always use a sharp blade.

9. Jack plane & smoothing plane

10. Front knob

11. chisel inside jack plane.



12



13



14

Chisel

A chisel is a tool usually used to cut/slice/carve with a straight cutting edge (at right angles (or square to) the sides of the blade.

Chisel use involves forcing the blade into some material to cut it. The driving force may be applied by pushing by hand, or by using a using a mallet or hammer

Chisels have a wide variety of uses. Many types of chisel have been devised, each specially suited to its intended use. Different types of chisel may be constructed quite differently, in terms of blade width or length, as well as shape and hardness of blade. They may have a wooden or plastic handle attached using a tang or socket, or may be made entirely of one piece of metal.

12.close-up view of chisel tip

13.chisels for wood-working

14.chisels for wood-turning (usually they have longer handles for better stability easy to grip.)



16



17



18

A file is a metalworking, woodworking and plastic working tool used to cut fine amounts of material from a work piece. It most commonly refers to the hand tool style, which has the form of a steel bar with a case hardened

Files usually comes in a wide variety of materials, sizes, shapes, cuts, and tooth configurations. The cross-section of a file can be flat, round, half-round, triangular, square, knife edge or of a more specialized shape. There is no unitary international standard for file nomenclature; however, there are many generally accepted names for certain kinds of files.

16. Hammers with wooden handle.

17. close-up view of files & rasps(from left to right: semi-circular file, triangular file, small semi-circular rasp, pointed rasp, circular file, flat file, round file.)

18. Files & rasps

Chapter 3

Woodworking is the activity or skill of making items from wood, and includes wood carving, joinery, and carpentry.

since childhood woodworking is something which always made my mind curious. The carpenters, the wood carvings, small wooden products and crafts, the furnitures etc. all were in my mind. But when I started working it was not as easy as I thought. Woodworking is something which needs a lot experience and sense. Traditional woodworking needs more experience and skills compared to modern/contemporary woodworking, where they use a lot of machines. When you use machines you wont be able to “understand” wood. It might feel same as any other material when you use powered machines. But when you use hand tools to work in wood you can feel the wood, its strength and patterns. It is very important to learn and understand woodworking tools and about wood before starting with the work.





Spatulas

Wood used: Teak wood

Tools used

Bench vise, preferably attached to a sturdy bench or else it might shake while using.

One or two large carving gouges

A hand saw & small saw for small cuts

1 chisel

A drawknife

A half-round rasp and half-round file

Card scrapers (one flat, one rounded)

220 grit sandpaper.(smother ones if you prefer)

Process

1.Mark the wood according to your design. (spatula/spoon)

2.Slice up the wood.

3.Cut & remove material

4.Sanding has to be done (you can use files with big teeth/rasp or you can use chisels to remove material but very careful)

5.Hollow out the spoons using a gouge chisel

6.Finish the spatula by files with small teeth and then use sand paper for final smoothing.

Wood Selection

For making the spatula or spoon you can use any hardwood, and I have used Teak wood. But it is good to start with a soft wood for better understanding. Straight-grained wood is better. Since i started with a hard wood it took a bit more time in making the spatula.



Smart-phone stand

The focus area of this exercise is to understand the usage of tools and basics of woodworking. So a simple design is taken for the product.

Wood used : Jarul

Tools used : Hand saw, Jack plane, tenon saw, flat chisel, Tenon chisel, smoothing plane, sand paper & oil stone.

Process

1. Measure and mark the wood to the desired dimensions.
2. Fix the wood such that it wont move/slip or shake while planing.
3. Using a Jack plane plane to the marked points.
4. Once it is levelled mark the lines to cut
5. Using a tenon saw carefully cut the piece.
6. After cutting the piece remove the material with using a tenon chisel and hammer
7. Finish the piece using a smoothing plane.
8. Using a sand paper finish to smooth level if desired.





Bottle stand

For display area in wine/liquor shop

The focus area of this exercise is to understand the usage of tools and basics of woodworking. So a simple design is taken for the product.

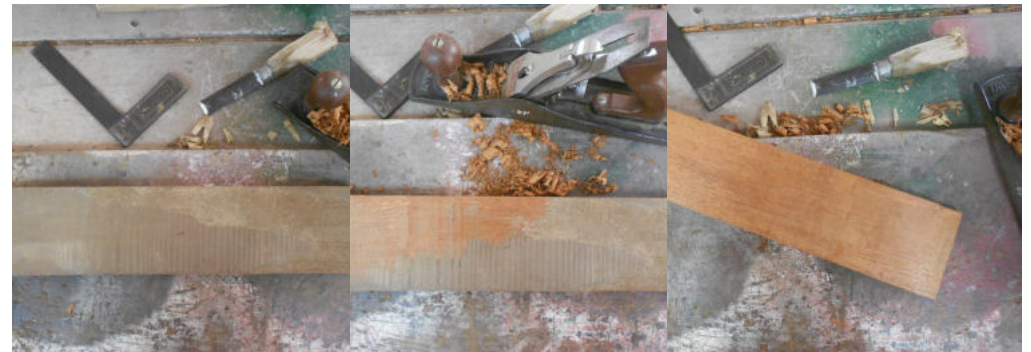
Wood used : Jarul & Andaman Padauk

Tools used : Hand saw, Jack plane, tenon saw, flat chisel, Tenon chisel, smoothing plane, sand paper & oil stone.

Process

similar as before (for the mobile stand)

1. Measure and mark the wood.
 2. Fix the wood such that it wont move/slip or shake while planing.
 3. using a Jack plane plane to the marked points.
 4. Once it is levelled mark the lines to cut
 5. Using a tenon saw carefully cut the piece.
 6. Finish the piece using a smoothing plane.
- repeat the same process for the base of the stand. Once finished you can apply the shellac or other finishing solution.



Chapter 4



Woodturning

Woodturning

Pestle and mortar

A Pestle and mortar is a device used since ancient times to prepare ingredients or substances by crushing and grinding them into a fine paste or powder.

Wood : Teak wood

Tools used : Hand saw, flat bench chisel, hammer,

Machine & tools : Turning machine, chisels with long handles (HSS (High speed chisels) more preferred) for best results. Normal soft iron will loose its sharpness fast and might need to sharpen very often. These normal chisels cannot be sharpened with grinding stone machines, they can only be used with oil stone or similar grade sharpening stones.

Process

1. first step in wood-turning is to identify and visualize the product or objects shape we want to make in the wood.

2. Once the orientation is decided according to the grain you can attach it to the machine.

(depending on the machine it varies, also it varies on the design of the product. some can be clamped with the chuck, some have to be stuck with glue, while some can be clamped with screws)

3. After attaching the work-piece you can start removing the material bit by bit using the chisel. (Hand should be really steady while working. Otherwise the tool chisel may “bite” on the wood leaving marks on wood or would risk an injury to the person.)

4. once the wood is perfectly cylindrical , you may start using another chisel according to your design.

5. once shaping is finished, one may use different grades of sand paper to smooth-en it.







Wood : Teak wood
 Tools used : Hand saw, chisels
 Machine & tools : Turning machine, chisels with long handles
 (HSS (High speed chisels) more preferred)
 for best results.

Ash tray



General tips.

Have the lathe at the right height so that you maintain good body position for wood turning. Try to work at your comfortable height, because you need to work more than a bit of time.

Have plenty of light.

Wear protective glasses and a mask.

simple pen stand



small bowl

A small turned bowl which can be used in kitchen or some other place which can be used to put some spices or dry chillies.

Wood used : Ashwood

Tools used : Hand saw, Chisels

Machine & tools : Turning machine, chisels with long handles
(HSS (High speed chisels) more preferred)
for best results.

Process

The process is same as the other turnings. Since we are using softwood we should be little careful while turning, big knots should be avoided since it effects the strength and might break without warning. Also since its soft compared to hardwoods a small strike could result in big impact and mark on the wood.

Photograph of woodturning chisels.



Small plant pot

Wood used: Ash wood

Tools used : Hand saw, chisels, sandpaper.

Machine & tools : Turning machine, chisels with long handles
(HSS (High speed chisels) more preferred)
for best results.

Process : Same as previous turnings. the wood should be marked before putting to chuck. Just take precautions like wearing a safety goggles to protect from flying particles of wood.

Photograph of the woodturning machine.





Flower Vase

Wood used: Ash wood

Tools used : Hand saw, chisels, sandpaper.

Machine & tools : Turning machine, chisels with long handles (HSS (High speed chisels) more preferred) for best results.

Process : The process is similar to that of other but since it has more length it is best to fix one end in chuck and give support at other end to avoid wobbling and breaking.



Wood used: Ash wood
Tools used : Hand saw,
chisels, sandpaper.

Machine & tools : Turning machine,
chisels with long handles
(HSS (High speed
chisels) more preferred)
for best results.

Process : The process is similar
to that of other
turnings. The deep hole inside the
vase can be made either by drill-
ing into it or removing material
using thin chisel while the
work-piece is still on the chuck.
Since it is a softwood, some small
chippings left marks, which can
be later filled with a filler
and finished.

Flower Vase

Lessons learnt

- . Learnt about wood & basics of woodworking
- . Learnt identifying & selecting of wood for woodworking
- . Learnt about types & usage of woodwork tools.
- . Learnt about wood-turning
- . Got to see & understand about different crafts from traditional craftsmen.
- . Got to understand about the design history of india, why it started, the ideas behind craft innovation and production.



Travelled accross India,
Saw a new city & culture,
Ate different food
Met new people,
Gained a few friends,
Saw different crafts,
Learned one,
Reviewed & developed a sense
towards crafts,

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Thank you