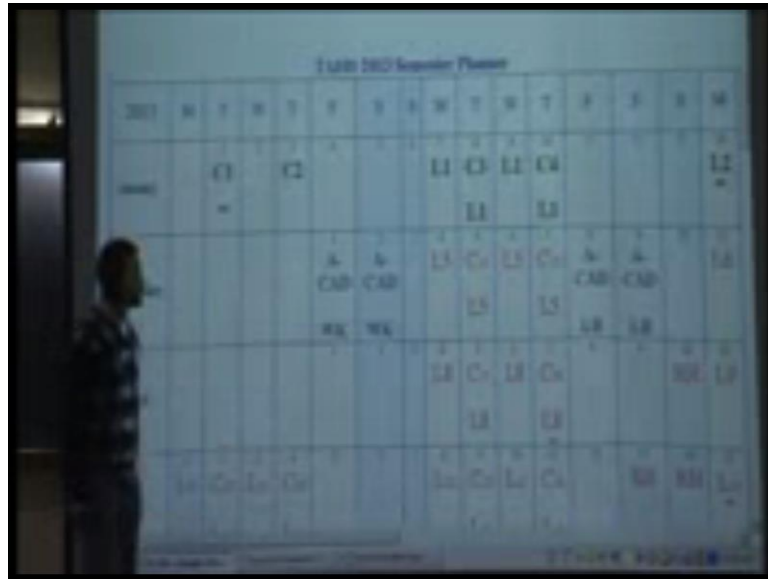**Technical Arts 101**
Prof. Anupam Saxena
Department of Mechanical Engineering
Indian Institute of Technology, Kanpur

Lecture - 5

(Refer Slide Time: 00:24)

For the first of February and the second of February and so this is a, for you to get familiarized with the software. One of my students will be taking the work shop and after you get familiarized. The next auto cad session will have you work on little, ((Refer Time: 00:50)) so that could be on eighth of February and ninth of February. So, this is the tentative schedule batches B 4, B 5, B 6, B 1, B 2 and B 3.

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They will be doing their labs as well as workshops on Friday in between 9 and 1 ((Refer Time: 01:22)) and the rest of the 6 batches they will be working on Saturday. So, I believe you are going to having your NCC and NSS or whatever CPA on Saturday mornings. So, I am assuming that you are free in the afternoons of Saturday. So, it is from 1 30 PM till 5 15 PM. So, if you scroll up little bit on my web page.

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We have a manual for you, we have so you can download it, take a print out, make copies, borrow, steel if you want to. I believe that in the labs, we also have internet

connection. So, if you do not want to take the printout this, you can access it through the net, but whatever. I would suggest that printout these and have a copy of this with you while you are working with the problems. So, today we will see another example in orthographic views third angle. And this is one; this is the solution to one of your problems in lab 3 things will get little complicated from now on.

So, some of you are not able to access the power point presentations through rib is it is it the case. So, I believe in computer center, you will have either the Linux based labs or windows based labs. So, I have a feeling that a, you would be able to access them through the windows lanes ((Refer Time: 03:29)) that. Linux; I am not really they would support to p p s x. Let us gets started, you know when I was on the other side of the table when I was sitting among one of you, long time ago not so long ago we use to see this ((Refer Time: 04:01)) you know who this is?

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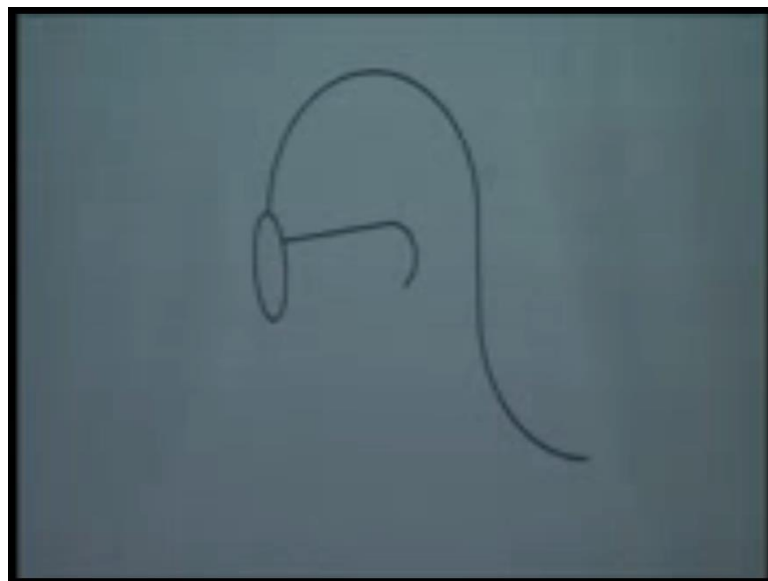
One more time, set of curves, set of lines, ellipses deals with very well what we are discussing in class. And there was a statement with this add the greatness of this man was his simplicity he taught us he taught the entire world lot of things. And I would want to say a lot of things about him, but I would other focus on the example. But one of the thinks that he taught about or he taught to us to was to go bottom up in anything. That you do not go top down, but go bottom up there is the logical way of approaching any problem and t a is all about going bottom up.

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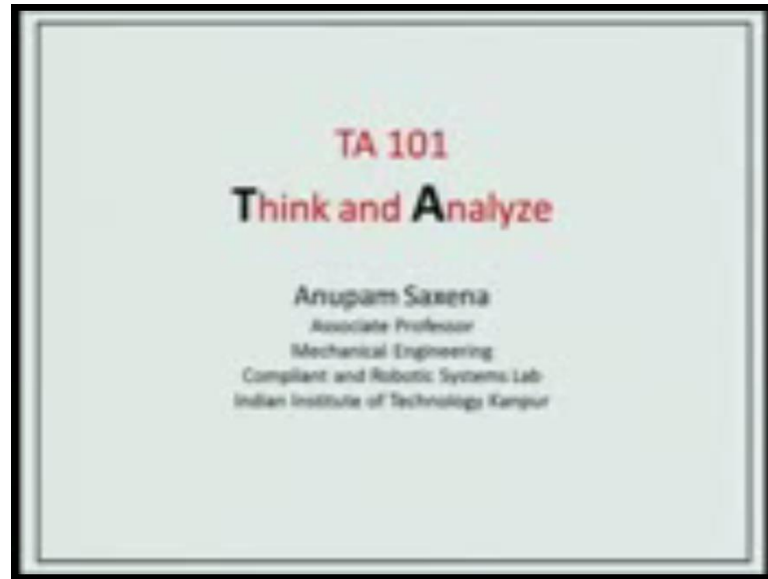
Alright, so example 2 this is going to be little complex.

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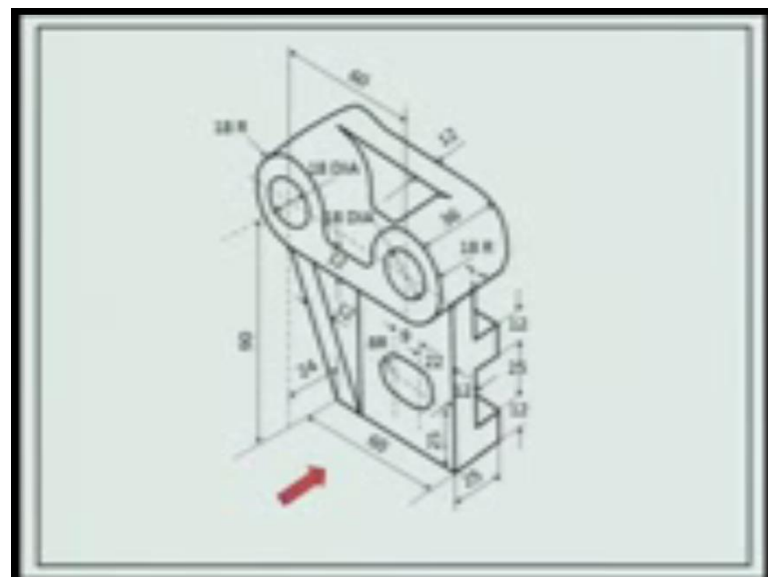
So, we are going to be drawn the orthographic views third angle of this solid. So, this happens to be one of the problems in lab 3. So, I will project this picture for a while you have your note books and pens in front you. How about taking 5 minutes and trying to sketch this without making much noise 5 minutes is too less a time to for your sketch, but try it out. So, let me here only the scratch of your pen on a note book nothing else. Think and analyze; so, course this side of the solid is front of you. So, for those who

have already done lab 2 yesterday and today, is it little more difficult or so, we have 2 cylindrical features here.

So, if you having hard time understanding or imagining the solid I would suggest you that to break the solid down into different features. So, you would have 2 cylindrical feature here 1 rib at the back, 1 rib on the left 2 supporting webs behind a plane with the source electrical void. And these a circular through holes break the solid down in to different parts that will help you imagine the solid little better. Let us have drawing focus on the right box of a sheet fill out the details. Can I go a little these well the pictorial view this is not so very clear, but your assumption is valid. So, you have to assume that they go all the way back they stay horizontal and they go all the way back.

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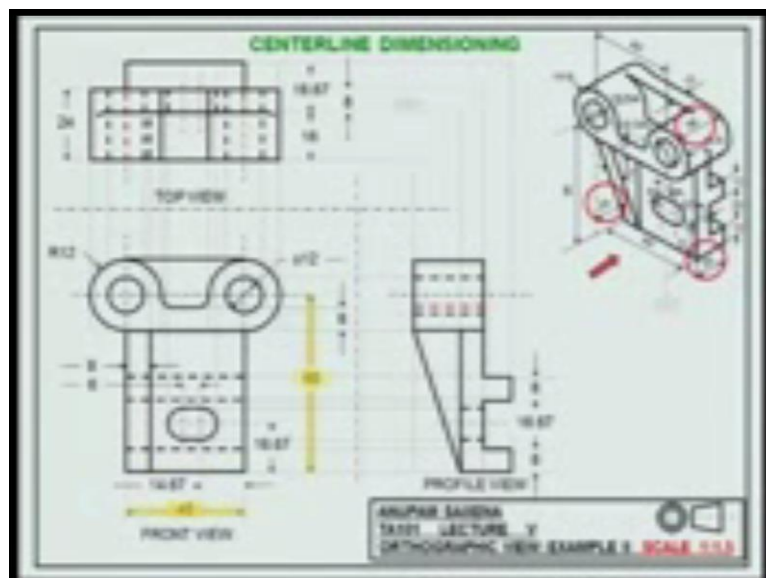
First fill out the details in the bottom right box of a sheet, use the convention for third angle projection. So, for this I am using scale 1 is to 1.5 and I am using scale 1 is to 1.5 what was the first thing that we need to do?

Student: Hinge lines.

Hinge lines, but before that identify 3 critical dimensions. So, if you assume this plane to be a reference plane this dimension over here corresponds to the dimension here. The height of the rib this one here takes you back from the reflex plane and this would

correspond to the length of the cylindrical features alright. So, this drawing we will draw this using reference plane in mind.

Let us see how reference plane, draw the hinge line that differentiates between the front view and the top view. And then what bounding box what is the length of this 60 for these bounding boxes corresponding to the cylindrical features that is what you would see. So, you will see this plane and then you will was see these cylindrical features. So, it is actually 60, but the scale is 1 is to 1.5. So, I am using the dimensions I am reducing all dimension by two third or 2 2 2 2 two third. I am making a mistake, I am making mistake good so, long is you are realize that you have to show 2 dimensions. I am happy. For now I am showing this scale dimensions for you to understand. What is this height? 90 times 2 or 3 take the projections up the first things that you would want to draw in the top view is the reference plane this plane.

So, you will see that plane is a line or is represented by a line in the top view, what is this dimension? What was this dimension correspond to? How much? One of you raise your hand and 24 scaled dimension; scale dimension, two third? So, from this reference plane you are now measuring the feature at the back what is this dimension I am depicting you the scaled I am depicting the scale dimensions. So, this is for you to realize the scaling alright. So, the top view will be bounded in this box take this projection upwards. And draw the bounding box for this cylindrical feature, what is this dimension cut? Do the same for the other cylindrical feature as well.

So, of course, a cylinder is symmetric about its axis you show the axis a x e s of the 2 cylinders using dash long dash short dash long dash short dash or dash dot the convention we have been using. And then start relating the top view to the side view using projections 45 degree line go down relate the side view to be front view as well. That is your reference plane in the in the side view what for this projection correspond you, what for this projection correspond to the cylindrical feature in the side view. So, this is the box that bounds the symmetrical features it is symmetric about this axis show the axes of the feature. So, once you have the ground work done start drawing solid lines start for the race.

First step then what the vertical on the left vertical on the right. So, this line corresponds to what? No this one projected on the vertical plane good this edge corresponds to what

this one good that is the projected on the vertical plane, what is the width of this? Right let us proceed this is the circular void through the cylindrical feature the center is the intersection of 2 dashed dotted lines right. Same thing on the right would you see this edge should I will be drawing the full circle or should I will be drawing three fourth circle for this three fourth. How about the circle on the right three fourth? Now be a little careful here be a little careful here what I do next? I need to worry about this dimension na this dimension is 8 I draw a little fillet from both circles. And I joined the 2 fillets by straight line am I done still long way to go alright shall down. What is next dimension then void, what is this called? 5 alright 5 what is this part of the dimensioning called leader angled at 45 degrees to be horizontal.

And then followed by a horizontal line this is a 12, what is this height? See this gray line here, what is this height I am drawing this void now settled down, what is this height look at the first center look at the second center? What is this ha, what is this distance? I am helping you with one of the solution come on. What is the distance fourteen point? How I located the 2 centers properly one here one here yes or no? Draw 2 semi circles join them by 2 straight lines. And you have you have what you have a void which looks almost like an ellipse, but it is not an ellipse. It is a slot am I done what I am left with one at a time, somebody raise your hand the dash lines of the backward these guys how about these guy still long way to go. We will come back to the front view little later.

Let us top view 2 cylinders now, hold on the extreme edges a, long the intermediate edges are short these 2 edges a long and these 2 edges a short what is that, why is that? Because of this feature right so, becomes easy for you to have a reference line or reference plane. And then draw things with respect to that plane take the projection of these circular voids upwards to top view. And use dashed lines to show this void in the top view and likewise for the void on the right. So, this is an example that will demonstrate that is there are chances that going to be missing out quite of few lines not just 1 or not just 2. But quite of few will what edge this circle this one will it be visible, we will come to that come to that.

So, for now are you with me are you with me for now, who is not with me will be a curve right. But imagine this is to be a cylinder what you see rectangle so, imagine only this part what you see a line we will come to that no, but we will come to that. So, if I am making the mistake feel free to correct, but catch of with me you are with me now good

stay with me all right. Would you see this line? What was this edge corresponds to what was this edge corresponds to this guy here? Would you see this line? No this would correspond to this over here is it right now comes in important part. So, this is the rib and rib is such that a part of the rib is tangent to this circular feature here. And here how would you show that a line it is kind of extended after the axis of the 2 cylindrical features. And to show that it is tangent to both the features we use a little convention we show a little arc on both the sides.

Once again this rib is tangent to the both circular features. So, correspondingly the line is going to be extending towards or after the axis of the 2 cylindrical features. And to depict or to emphasize that this rib is tangent, we use 2 circular arcs at the 2 ends something new. What is this dimension? What I am doing now? I m taking the projections from here to represent this void in top view, you will see 2 hidden lines of course, where would may be? One would be here and the another one would be possible be here. Once again watch carefully, alright things are getting little complex.

Now, taking the projection from here, for this rib, what would I see in the top view? A hidden line up to where up to the reference plain up to this plain up to this line here. Coming to side view cylindrical features is easy cylindrical void is also easy, which one? This is like a ((Refer Time: 30:23)) right this is like a ((Refer Time: 01:28)), so it is glued to the reference plane. So, here the thickness of this rib is 0 and here the thickness is 24 here is it scaled or unscaled? So, total of that is 16 so if this is your reference plane at the bottom the rib it is going to start from here. And at the top is going to come here and since the rib is hidden behind the circular feature or cylindrical feature in the top view will be shown in hidden lines hold on, are you all with me?

Student: Yes sir.

Who is not with me? You are not with me.

Student: Sir, have a doubt?

You have a doubt inclined; so this is an imagination issue focus people I so you start imagining thinks better once we start dealing with isometric views. For now assume that this like a taper rib. Coming to the side view cylindrical feature, cylindrical void this is what represents plane this edge. This is what is this edge straight forward steps to step

straight forward this dimension what is that now? So, how are we doing? This we are sketching the front viewing part, we are sketching the top viewing part we are sketching side viewing part we are going back to the front view. And we are relating different features in all 3 views through projection line horizontal vertical right.

So, corresponding to this step here there would be dash line in dash view fill in the blanks 1 hidden line. The second hidden line and the third hidden line and the fourth hidden line there is no point, because there is a cult or there is behind this cult behind this solid line one at a time. I will come back to you, what this part which strip you know? I am so very glad that you are discussing among yourself, can I have all ears please all eyes here please, thank you. I am so very glad that you all discussing this problem if you are with your neighbors which is very nice think possible. This is not the right venue for that feel free to go back to your rooms and discuss as much as you want. One lesson in fact, 2 lesson well 1 lesson in communication skill 1 a 1 rather 2 lesson number 1.

If you want to be a good speaker you have to learn to be a good listener if you want to be a good speaker; you have learn to be a good listener right. And if you want to be a good leader you have to learn to be good which one this one behind what stripe this one. So, I just say I mean this picture is little ambiguous so amusing that that would go through out we are working with this solutions assuming that you will learn later how isometric views can be ambiguous this is an example. So, are you with me now free in lines? Listeners; what is this stand for? What is this stand for? Come down until this plan well. So, in fact, this boy explain to Shekari Ayush, I am assuming that these steps are going through out behind this solid.

So, they are not stopping anywhere I am assuming that I do not have the information but I am assuming that. They might as well have stop over here they might have stopped over here they may have stopped over here. But in any case I would not have known about that, because that correspond feature is hidden behind the reference plane. So, there is a little bit ambiguity in this picture but I am assuming that they are going through out. It would not if you are not. Well, the picture will be the same or similar so I said I have to give you additional information here which I have not. But I have to give you additional information for example, a phase like extended throughout are you all with me.

So, going future this projection line corresponds to so this would actually help you to depict this void in the side view. Hidden or solid lines should I been showing these axes hidden lines I am jumping I did a bit of side view. And then I am going to the top view and I am drawing the back portion of this. Now, look at these lines look at these lines I did not from here I did not starts from here rather I started from here. If I take a projection of this that would match with vertical lines likewise if I take a projection of this that would match with this vertical line. That would be the solid rectangle am I done still some work left, what is your first impression about this drawing complex? Simple, very simple, what complex? Difficult? Easy? Very easy?

Student: Sir, unclear.

Unclear? In the pictorial view I may in the isometric view, the wonder right or top right. So, I agree with you I should have given more information, but it is only these parts in the picture which is not clear which are not clear. They are more which once which once these guys these guys these voids well. So, if I so hold on hold on so, there is a term that we used to depict the depth of the void deep. So, when I say 5 let us say 10 and 10 deep that means I am referencing to the pot hole with diameter 10 and depth as 10 or 20. If I do not specify the depth you assume that it is void about 10 or so more minutes and then we are done. It is very lightly that you are going to missing this line in the side view.

There are so many lines; thank you there are so many line that you are drawing that is very lightly that you have going to missing this line in the side view. That corresponds to this edge here all the lines that I am showing now on are pretty much in red. These are lines that you have going to be missing top view profile view. This is the line that you might be missing, what was this corresponding to? This line corresponds to the section between the 2 cylindrical features and the rib what was this line correspond to this guy here? You might forget you might forget to represent this central source speak electric void in the top view. So, the center lines here you already represented this, what does this line correspond to on the right side right? What was this correspond to it is this plane right in the view have you done? No.

So when you are drawing these orthographic views. You need to be very careful and one way to practice or exercise care is to ensure that each and every feature in each and every drawing is related by the corresponding projection line or the construction line. This arc

no, but this arc is this arc is used conventionally to show tangency between 2 features. So, it is just to show that this rib here is tangent to the 2 cylindrical features on the left and on the right. This one these guys what they correspond to the 2 centers do not miss out any hold on. So, do not miss out the sorted line do not miss out any hidden line do not miss out the center line, do not miss out the lines of symmetry be very careful. You know I believe in learning by making mistake and I am not at all shy to admit that I make mistakes I made a mistake.

So, notice that I am using a different can I notice that I am using a different dimensioning scale. I am not using, I am not using a line dimensioning, but I am using the center line dimensioning differences are settled the number. Or the dimension is represented within the arrow almost at the center of the arrow. And whether you are using horizontal arrows or vertical arrows they remain number they remain what aligned to the horizontal they do not get rotated as it is in case of a line dimensioning. Again as I said there are mistakes one of the for most or one very glaring mistakes is the fact that I have used scale I have used scaled dimensions I am not used 2 dimensions. So, when you are making this drawing in your lab sessions make sure that you do not make the same mistakes as I did.