Technical Arts 101
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Lecture – 06

Our friend Nalin dhamela of b ten he lost his a three sheet. In fact, two of them one was a blank sheet and the other one was the one that had lab one work. So, of anybody in b ten b eleven or if anybody has found those sheets please return back to nalin, otherwise you can also go to the lab, and see if they are there and if not then. So, the second announcement pertains to homework number two.

I have asked you to draw sketches free hand sketches. So, the two possibilities possibility one is you can draw them on the respective a three sheets the second possibility is the sketch book what you prefer who goes for sketch book amen just your hand holding a pencil over a piece of paper alright, and of course the reason is quite obvious what is the reason rain alright, but just in case of it was not raining today very few of you might still have come late.

So, this is this is a game that I tend to play at times. So, given a word I try to prefix an alphabet and try to make different words. So, let us do this. So, try to prefix an alphabet and try to make different words e elate settle down guys and then before that no, no, no, no, no, no.

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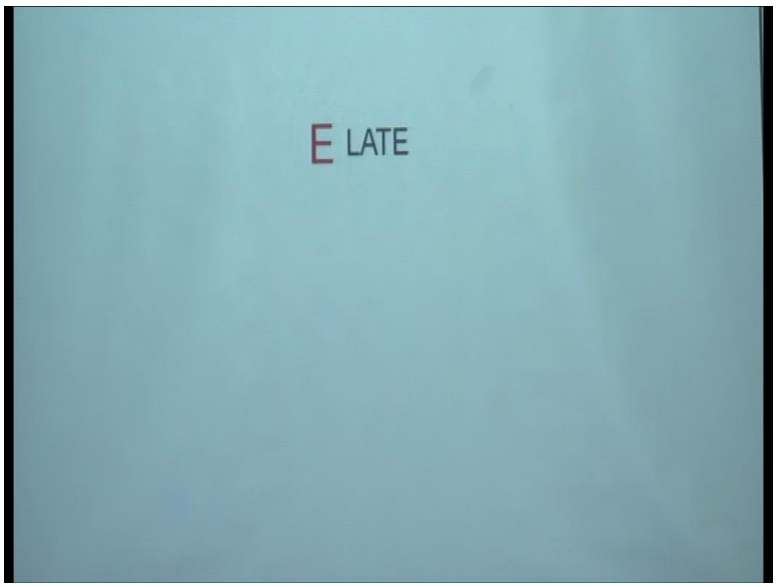

So, the game is about prefixing a single alphabet r late that knee a single alphabet right just a single alphabet that is for the free case.

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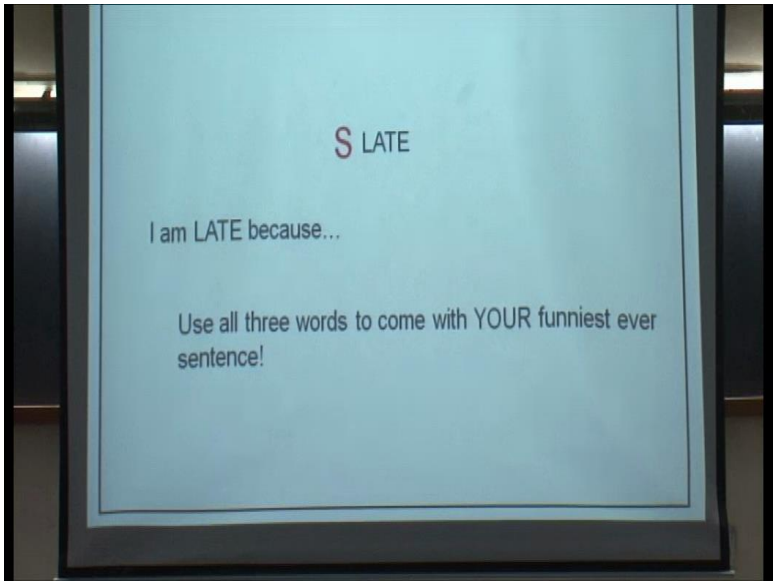

So, looks like the only three words possible one is elate the other one is plate and the third one is slate now this what I want you guys to do next time we meet in class come up with the reason you guys are very good at that. So, I am late because I am late because, but there is a little constraint here in your reason you have to use these three words elate plate and slate and try to come up with the funniest excuse that you can ever make. So, you have time until Monday, Tuesday, let us get started .

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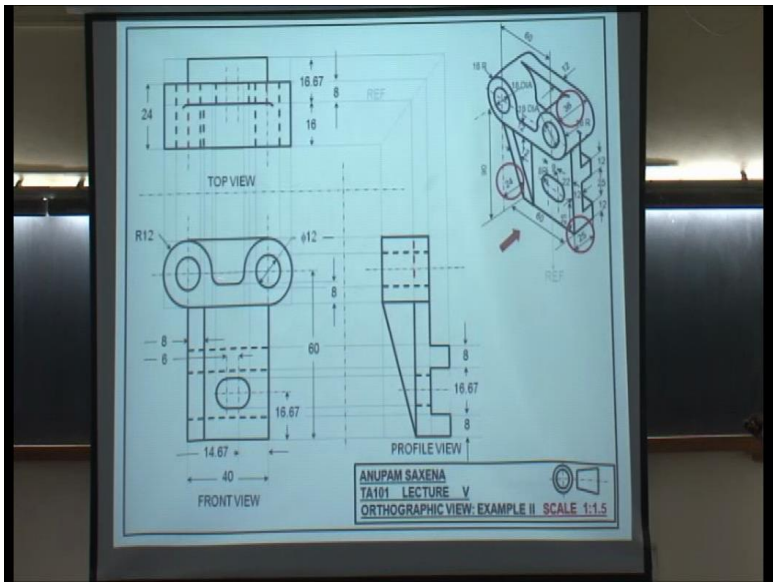

So, we were discussing this example before you know I am really very glad that you have started thinking in class which is a very nice idea this is what I would want you guys to do alright settle down thank you. So, quite few of you guys. In fact, quite quite some few guys had questions about the drawings that we were discussing yesterday in particular you know. So, I had drawn an arc here or filet if I may call and a filet here and many of you guys said well I mean if there are two filets here then this actually happens to be a smooth surface and correspondingly there would not be any line here here and here true right. So, this was a doubt na. So, let let me make or let me propose a few changes in the drawing let me propose a few changes in the drawing what I do is I let go off these arcs I have a line I extend vertical lines from these points ok and if this is the scenario then do you think that I will be getting the corresponding lines in the other two views yeah.

So, I will be getting the corresponding lines in the other two views, but think from a realistic view point is it possible for you to manufacture an object with a ninety degree angle here and here yeah is it possible for you to manufacture this object with perfect ninety degree angles yeah yes or no, no realistically there would be a little curve there would a little curve here and a little curve here. So, let us draw that a little filet scrubbing up. So, disenable just little filet, but the corresponding lines in the other two views will still remain ok alright any questions yeah tell me, where are these lines can you show this to me am I impressed or am I interested well I spent five minutes discussing this you

prepared this in five minutes almost ten minutes not bad alright. So, just for your benefit since you have worked quite hard what I was saying was this was the initial drawing and if and fact. In fact, this was a question that was raised by you. So, these this this is like a smooth surface and correspondingly there would not be lines in the other two views make sense make sense.

But what I am proposing is a slight revision what I am saying is what if I let go these smooth curves have a horizontal lines extend the circular arcs through these vertical lines and I get perfect ninety degrees then I will have those lines why not if this scenario are we going be having those lines we will we will right now there is the critical aspect and this the realistic aspect or the practical aspect practically will be a little difficult for you to make a perfect ninety degree angle it will be difficult, so practically. So, actually what we do is you'll actually be seeing surfaces like this just little filet just a little filet, but assuming that these two angles are ninety degrees assuming that these two angles are ninety degrees in the front view you will actually be seeing those lines slight revision what I propose ok.

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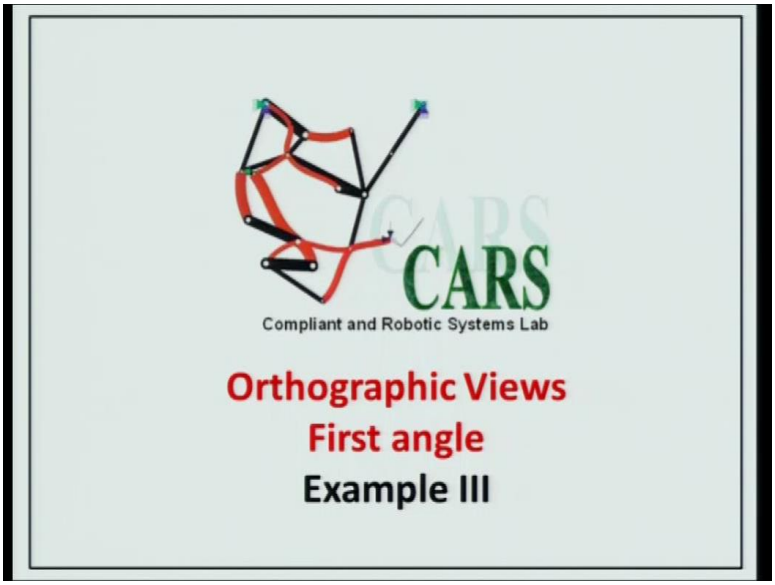

So, let us get started. So, today we will study first angle projection alright. So, you have done lab two where the third angle projection and this is example three in orthographic views of very familiar object victripodium.

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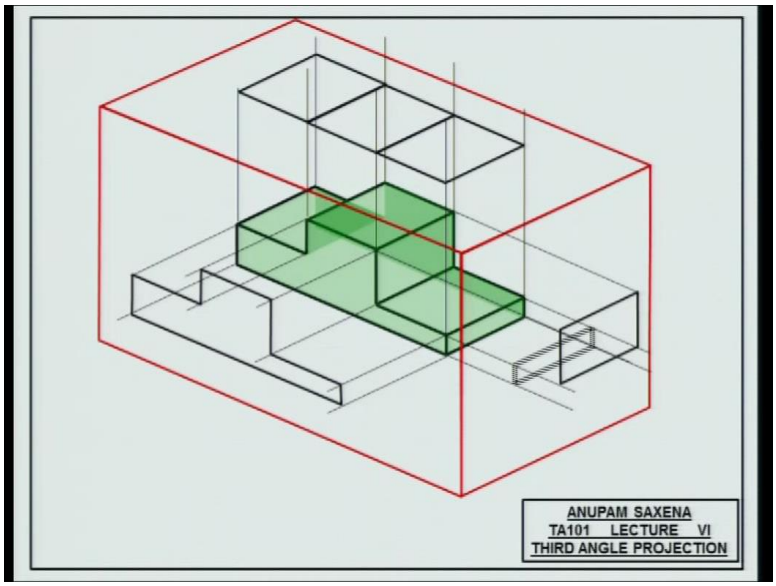

Let us recapitulate what we did in case of third angle projection you had a plane in between you and the object you imagined that they were light bulbs all along the edge of the object that emitted light along three directions. So, this was a plane on the right again in between you and the object on top again in between you and the object these are the lights the light rays falling on the vertical plane and this is what you would see if this plane was a photographic paper.

This is what you would be seeing from the top, and this is what you would be seeing from the side you have done this before right.

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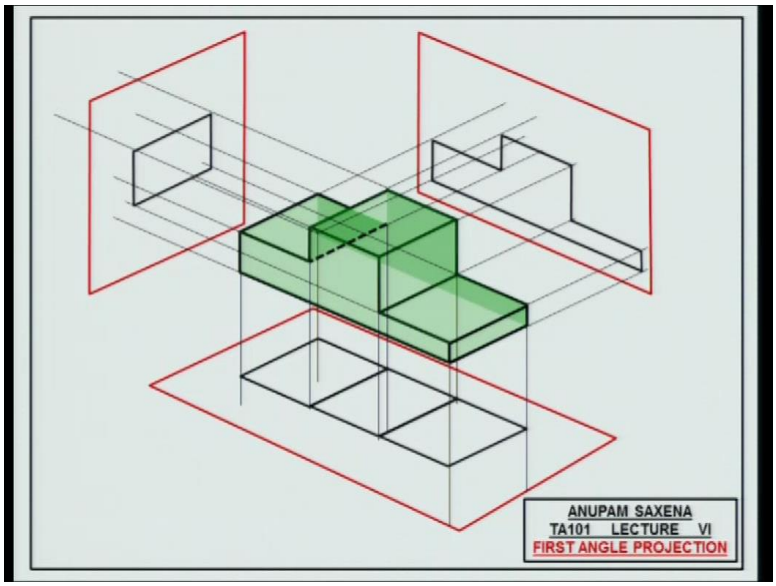

Let us consider the same object, but we will consider a different scenario we will say instead of the plane being between me or between you and the object the plane is behind the object. So, the object is placed between you and the plane. So, this is a vertical plane that is behind the object the horizontal plane is to be placed below the object and the profile plane is to be again placed behind the object all that has happened is the scenario has changed the location of the plane has changed relative to you in the third angle projection the plane was in between you and the object in the first angle projection the plane is behind the object, and let us do the same exercise rays falling on the plane what will these rays capture what will these rays capture the light bulbs are here. So, these rays will essentially capture the loop that you see now note that the loop is coming from the front the loop is going on to plane from the front not from the real side of the object once again.

So, what is the impression that the horizontal plane is gonna see almost same thing the loop is gonna come from here from the top surface of the object this one and this one once again it is coming from the top of the object how about this right. So, so what is actually happening this plane is capturing what you are seeing from here this one is happening actually this plane is capturing what you are seeing from here this plane is capturing what you are seeing from the top not from the of the object, but from the top and this plane is capturing what you seeing from here right.

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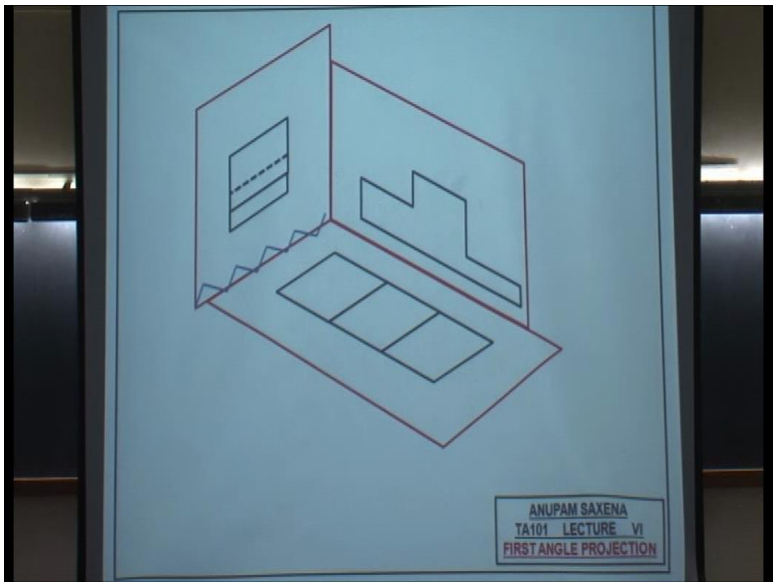

Let go the object we came the impressions on the three respective planes join these curves together with that boon carry this part off and unfold yeah, start from the other side if this is the direction of your frontier view that plane behind the object captures the impression of the object as if you are seeing the object from this side this one is from the top this one is from here. So, you need to be a little careful in trying to comprehend this once again join this curves together to a this part to this inch.

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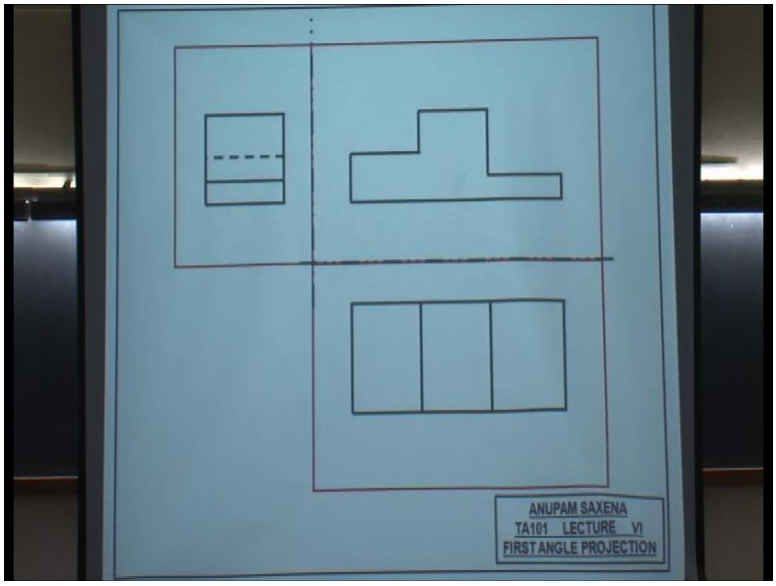

And unfold where is your front u n a where is your top u n a does not make sense right top here the bottom which view is this right sided you have seen the object from the right. So, it is a right sided ok. So, it is always a nice idea for you to get the concept. So, that you do not have to remember and if you have to remember then this is a very simple golden rule that I used to follow when I did not understand this in the first angle the top is at the bottom of the front and the right is to the left of the front just the opposite, but it is the concept that is important be the third angle projection or be the first angle projection you have you have been working with third angle projection you have drawn the front view the top view and the side view now can you answer this question to me or to yourself which of the three views is the most important which of the three views is the most important have you guys heard of something called f t p f t p fire transfer protocol na that is the front view top view in the profile view.

So, which one is the most important view front, well the choice is yours that conventionally conventionally, we chose the front view to be the most important view and having said that what do we do we chose the object or we chose the placement of the object in such a way that we are able to give as much details in solid lines not hidden lines in solid lines in the front view what we try to do is we try to minimize if not eliminate the hidden lines or the presence of hidden lines in the front view that choice is ours right. So, the front view is the most important then the top and then the profile hence f t p front top profile.

You know I have never gotten somebody agreed to me like that concreting with the song why this called the first angle projection. So, if you imaging that you are drawing is divided in four quadrants your front view which is the most important amongst f t p is lying in the first quadrant and hence it is called the first angle projection why is the third angle projection called the third angle projection there your front view is here in the third quadrant right.

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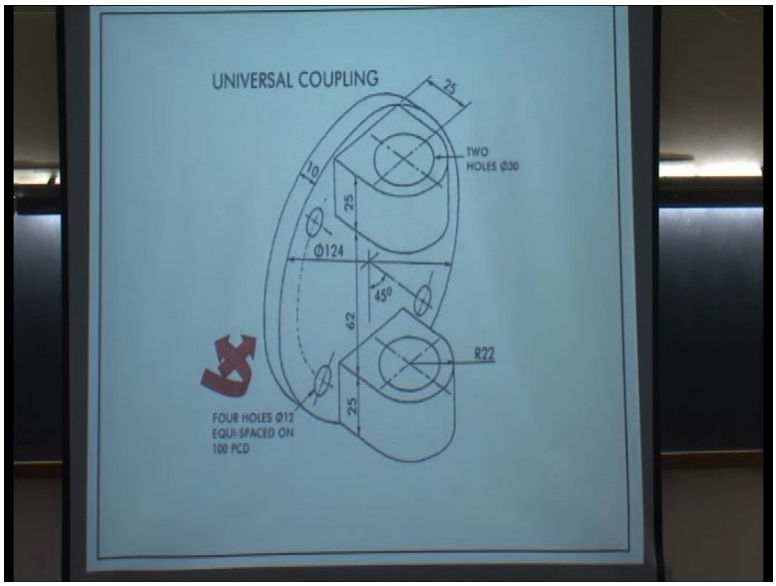

So, let us draw this object in the first angle projection would you like to take five minutes to sketch or to try to sketch now, now, now, now. So, before you start sketching before you start sketching this is the front view direction and you have to rotate the object like this. So, rotate the object like this and then view from the front and then start sketching five minutes.

So, if I were to ask you to describe this object what would you say if I were to ask you to describe this object what would you say it is a desk or some thickness with four holes mutually a each other and then there are two extensions which are semi circular with two holes right a desk with four holes and then there are two extensions or two slightly semi circle in nature each with two holes or two wides that is not very difficult for you to imagine right take two minutes you know back in nineteen ninety when I was in the twelfth we used to have this concept of the class monitor right. So, you have just graduated from there from great school to grate school. So, our monitor then was sanjay tiwari and we used to talk a lot we used to prepare for r j e exams and we used to talk a lot and he used to have a hard time I mean he used to come up with list of many many students disturbing the class and he gave the list to my class teacher and she goes like ameet raaje he was my classmate and ameet raaje was like all perplexed he stands up yes maam, but we talking maam I was not talking I was thinking sit down do not think loudly yeah. So, do not think loudly sorry I did not want you sketch that box should we start its already two twenty nine. So, I still have about twenty minutes

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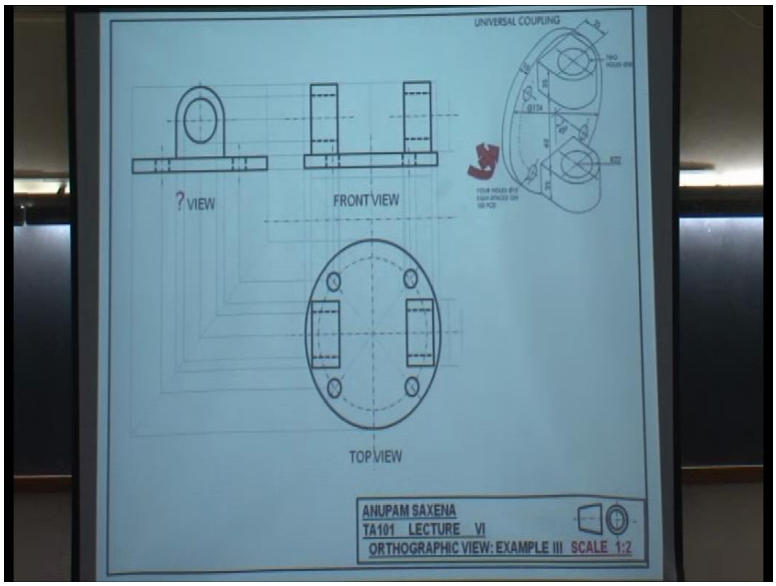

So, let me let me gets started. So, start with your bottom right box fill out the details fill out the details this the first angle projection. So, your convention of representing the first angle projection will be different can you hear me back there am I disenable am I audible. So, the convention to represent the first angle drawing will be slightly different again cone your front view is two circles I said a concentric circles what is shown in the left is what which profile the right. So, the profile on the right is shown on the left. So, in the third angle projection this curve was here in the first angle projection this curve will be here if I were to draw the orthographic projections of these how many views will I use two three one two why not three why not three the third is the same as the second.

So, although we are practicing three views at this time later on you will probably realize that in certain situations three views are redolent at times just two views sappiest and at times tree views are adequate, and at times even three views are not able to resolve the uniqueness in the object or uniqueness of the object. So, we had seen that cube example in our second lecture third lecture get this convention on the top right of the bottom right box please sit down here let us get started using scale one is to two most likely I am going to be using the scale dimensions not the true dimensions

The first thing I would do is I would start with the bounding boxes once again I have rotated this object like. So, and that is my frontal view direction there is no finish line there is no finish line on your t shirt alright what is the length of this box length of this

box why am drawing there fooks what am I drawing the front what is the length of thisthe same as the diameter of the big circle which is hundred and twenty four five hundred and twenty four right what is the width of this box or the height that is ten plus twenty five whatever this length is how much is that twenty five plus twenty two twenty five plus twenty five plus twenty two plus ten fifty seven good hints line that sapiens the top view from the front view projection lines that come from top in the top view you are going to be seeing a circle of five one twenty four since you are making a circle you have to locate the center using two dash doted lines I am showing this circle again using dash doted lines why is that. So, this would bear the centers the four centers of the smaller circles you know the circle is represented by p c d pitch circle diameter. So, hence I am using dash doted lines let us get started bottom line shows up the vertical line shows up this is of height ten this line shows up we complete this box. So, this represents the front view corresponding to this desk right extend the centre projection line up.

Now, what am I doing here what am I doing here I am trying to draw these two appendicitis na they will essentially look like rectangles in the front view you will be able to figure out the dimensions. So, dimension at this time not very important. So, the height of cores is forty seven and the width is twenty five right. So, this height is forty seven and this width is twenty five is that right no, then locate the centre of these through holes they will be at the same horizontal and show the two holes using using hidden lines solid lines right am I done what is this knot. So, I still have to sketch I still have to worry about these circles na right, but if I do that let me try to work with the top view bigger circle now what I have done is I have projected this vertical on to the top view from here from here. So, essentially in the top view I am looking at these lines this line here the line at the back right I know the length I know that the object is symmetric about the horizontal axis I draw four rectangles sorry I draw I draw two rectangles fine and then of course, the wides within those appendicitis fine now I am locating the four circles in the pitch circle diameters I locate the centers and rest is straight forward.

Once I have located these four circles I can take the projections of these on to the front view and show them using hidden lines right which is what I do here locate then centers of the two slengical wides and locate it the wides themselves in the front view right so far so good, am I done with the two views yes or no well of course, dimensioning remains, but I am not worrying about that as if now how about the profile view how

about the profile view where will I show the profile view left of the front view left of the front view. So, you remember I mean you relating the top view with the profile view using projection lines and a 45 degree angle yeah do you remember that from the speaks lab how would you do the same exercise here how would you do the same exercise here.

Start taking the horizontal projections from the top view draw a forty five degree line go up and join the projections emanating from the front view exactly the same exercise why because this dimension has to be equal to this dimension right once you have the bounding box ready in the profile view start drawing I desk well again look like a rectangle get the projections from these if may call get the centre extend then extend the lines look at the centre draw a semicircle and draw the inner circle its, if you want to take a quick nap its fine and then what relate that circle to the to the lines in the front view where construction lines and of course, the top view and from the top view get the projections corresponding to the smaller circles on the big circle diameters locate the centers and represent the smaller circles using hidden lines in the profile view of course, that is the top view at the bottom of the front view that is the front view which one right or left right any questions yeah in the front view centre what because the slentical wide is like.

So, this central line represents the access of the cylinder access of the slentical wide right one view is is redolent, but you say that. So, what you suggesting is just two views are good enough for us to represent this object you could be right what is the what perfectly perfectly conventions different people use different conventions. So, some people are com comfortable with first angle projections the other ones are comfortable with third angle projections can you stand up please what is your name louder louder turn around come up stand by my side. So, this friend of mine ashish agarwal he asked me when he was doing the second lab sir can I draw things in the first angle projections he was.

So, eager to draw this in the third angle in the first angle projections. So, I thought why not why not tell you all about first angle projection. So, that just in case if he happens to draw in the first angle projection you guys can all understand. So, there are different conventions that people use yeah yeah please any other yeah we do not draw doted lines for smooth filets I did not say that you know I have lot of to share with you one of them goes like when I was well this is this is when I was in the tenth grade I was reading a book and I read a quote by somebody some character in the story and I liked that quote

very much I am without politics I am without politics. So, please let me not behave as a politician here asking you to be quite every time. So, if one of you is getting up and asking a question please lent a politer to him or her, because then you will not be able to understand his or her question nor will I thank you I would not draw well, I did not say that what I said was if I made that perfect ninety degree angle then I will have a region of discontinuer; that means, that the two surfaces they will be stitched together in such a way that you will have distinct line and that line is going to be shown in yeah.

Well any feature that any feature that gives you the impression that there is some discontinuer in surface that is to be represented hold on hold no. So, keep that question in mind I will come back to you we still have the time. So, I will come back to you any other question pertaining to first angle projection yeah should not the top view well the choice is yours. So, you can choose the principle view to represent the front view the choice is yours I chose the frontier view to be there, but you can choose different view its perfectly fine any other question.

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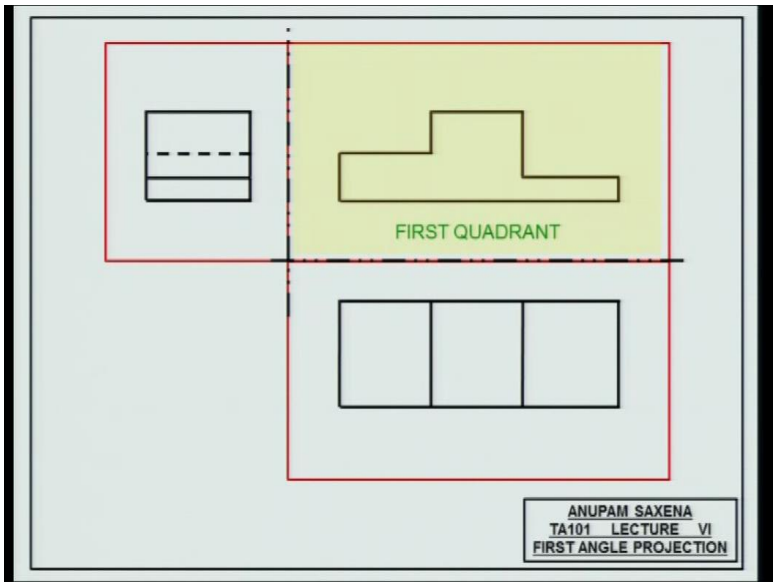

So, just to emphasize this is the what first angle projection why because the front view is lying in the first quadrant, and in the third angle projection the front view lies in the third quadrant hence the names.