Indian Institute of Technology Kanpur
National Programme on Technology Enhanced Learning (NPTEL)
Course Title
Engineering Graphics

Lecture – 22
Angular Perspective Views

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So last class we have covered few examples and we have also covers, cover types of perspectives.

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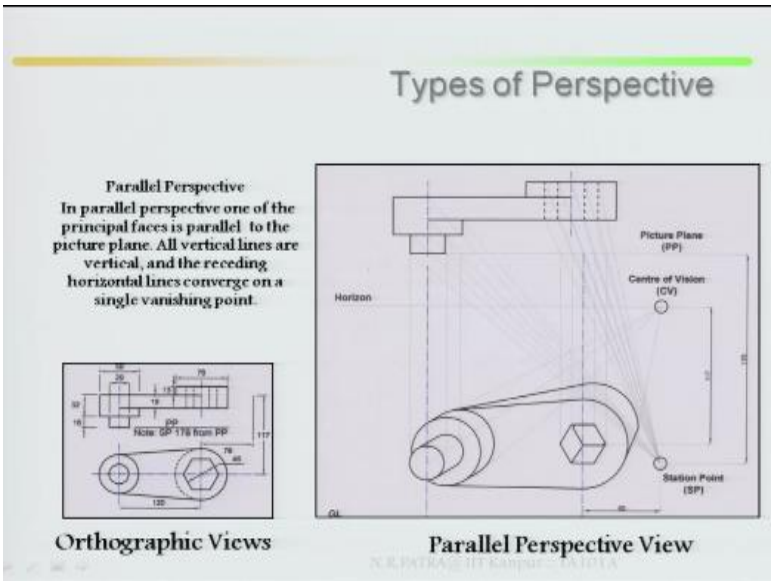

Once again I am repeating, there are two types one is your parallel perspective, and in this case of parallel perspective one of the principal faces is parallel to your picture plane, that means if this is your object of top view one of the face is parallel to your picture plane, then again in parallel perspective it is two types, either it is touching to your picture plane or it is some distance away from the picture plane.

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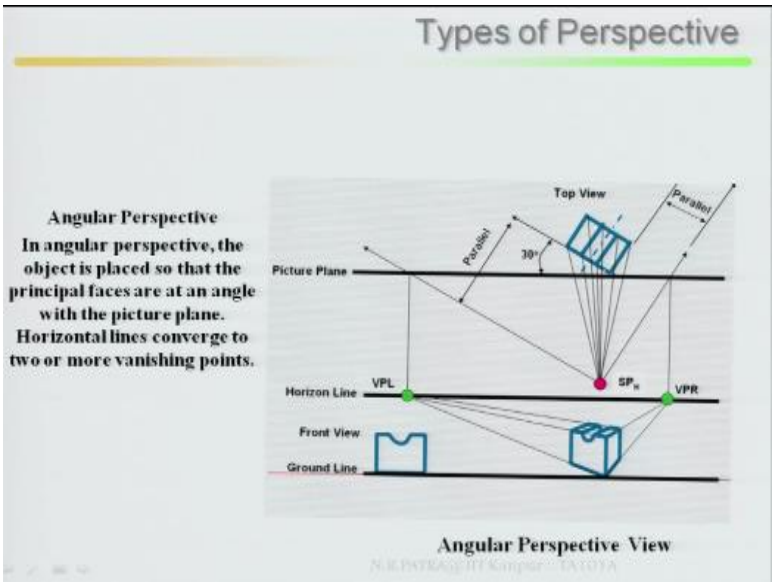

Other one is your angular perspective, in angular perspective the object is placed so that principle faces are at an angle with your picture plane, that means it makes with an angle with your picture plane, so that isometric view can be seen, if you look at here it has been made an angle with both these faces, left as well as right hand face. So in this case you are supposed to get two vanishing points, left vanishing point, right vanishing point if you come to.

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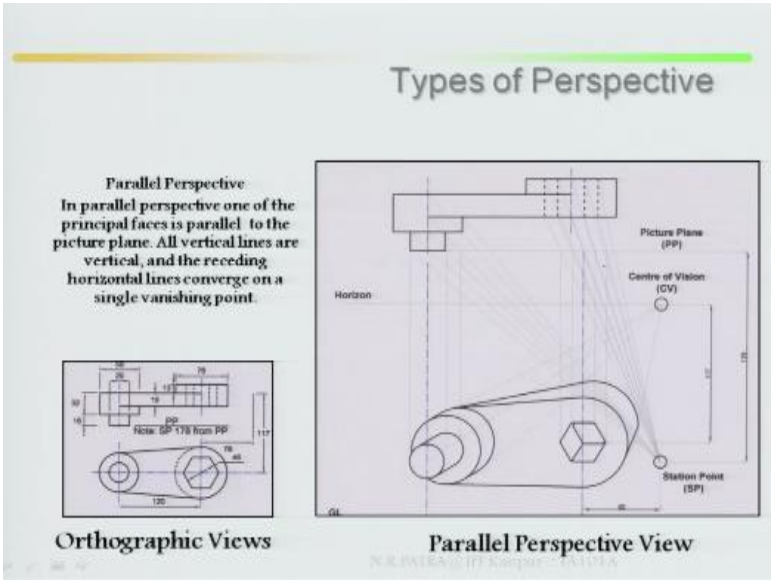

Parallel perspective, in this case only you will get one vanishing point, only one vanishing point.

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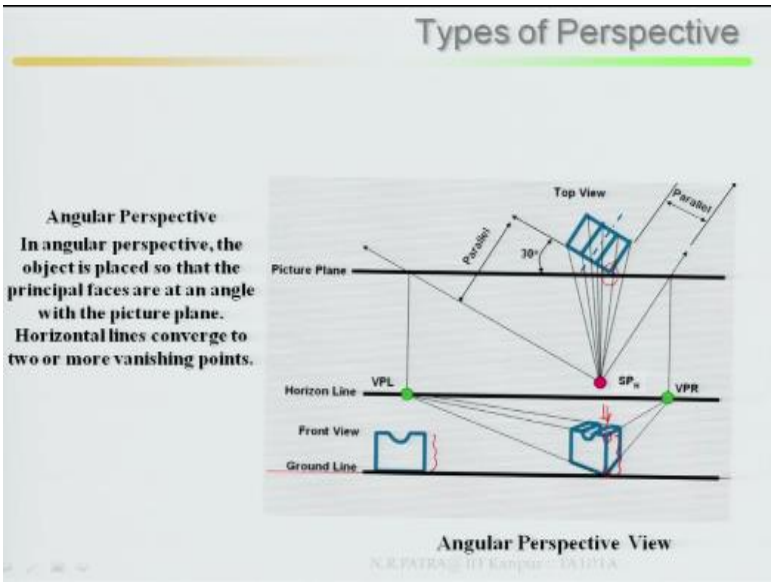

So this is the basic difference, again in angular perspective the object may touch either one of the edge are one of the face, it may touch your picture plane in that case what will happen, in this case for example if this edge is touching your picture plane that means this is in your true length, this edge with this height is in true length if you look at the top view, if I am looking at the top view from here particularly this point and this point is merging and this is the edge point.

So that means once it is touching that means this is in your true length, another while drawing this features I said once you draw it once you finalize your vanishing point left and vanishing point right, once you identify your true length of this object, then enter object to be in the left hand side part in this region of your vanishing point left, right hand side part in the region of vanishing point of your right, so that there will not be any chance of doing mistakes while plotting your perspective views.

So other part is in case of angular perspective it is not necessarily that one of the edge or surface is going to touch or going to touch your picture plane, it may be far away from the picture plane.

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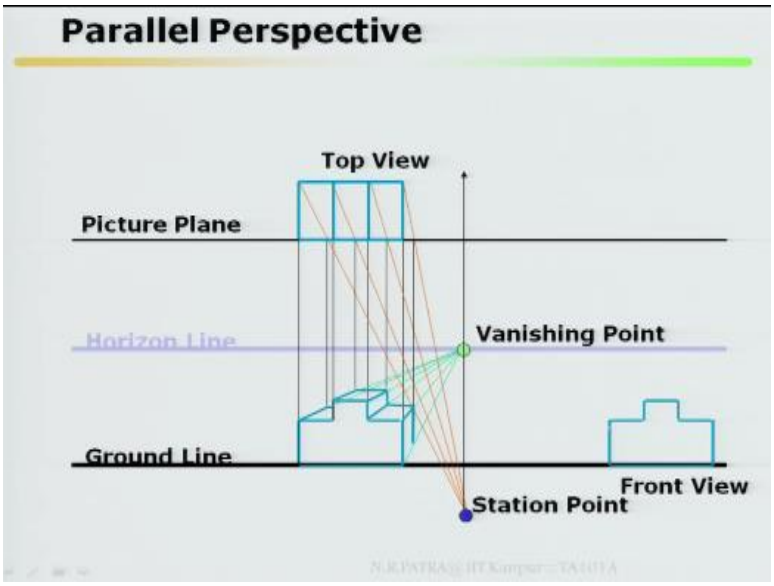

That example let me go to the, that example.

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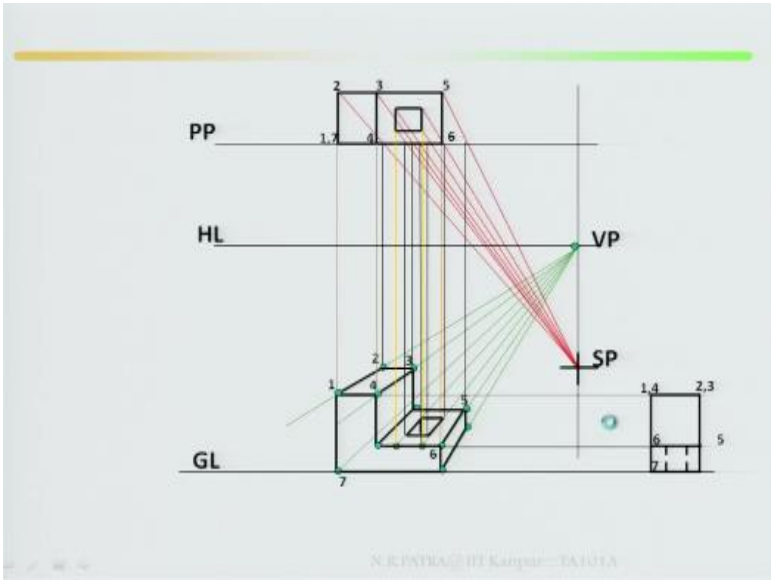

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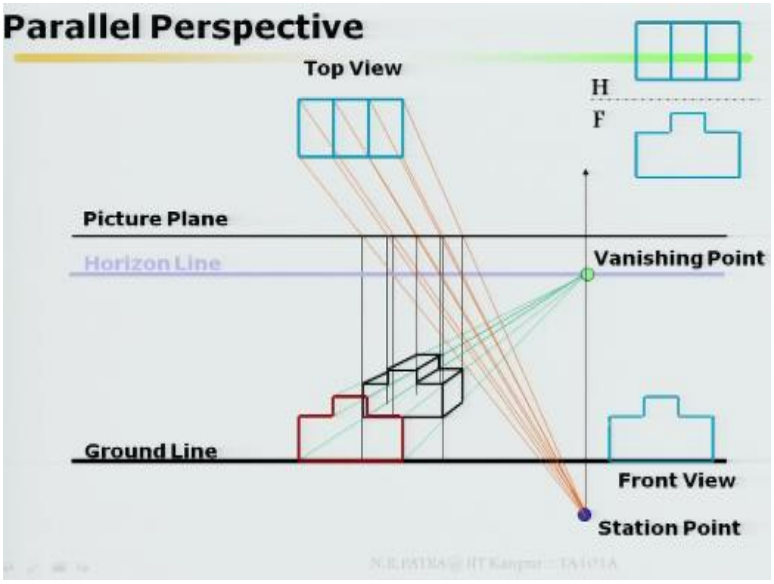

So that I have finished, up to that yesterday.

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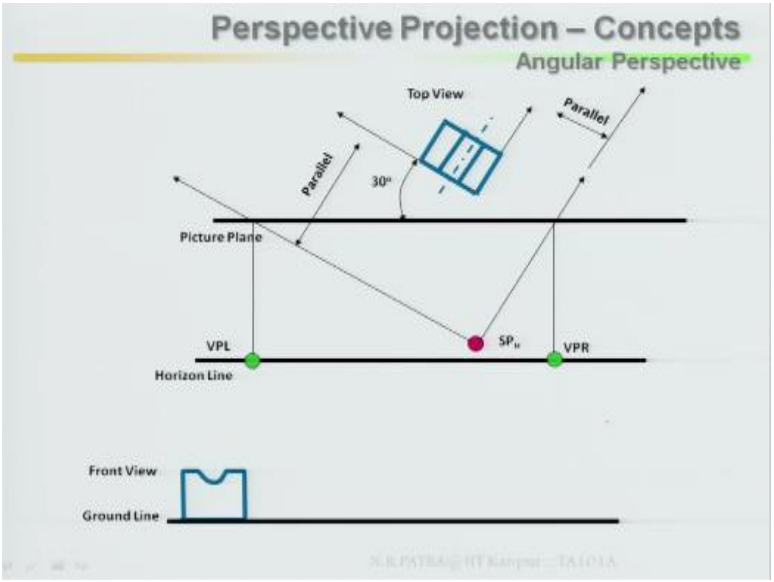

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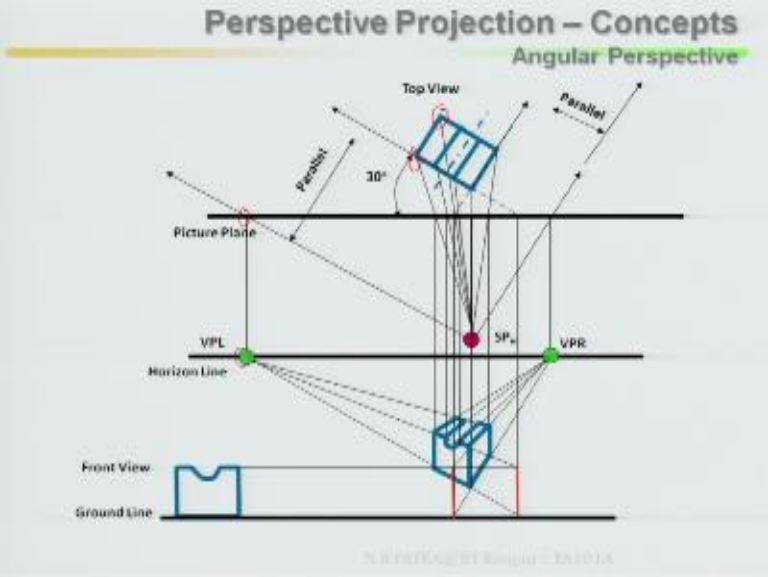

Yeah, look at this case these are the typical case it may come, in this case this is a angular perspective where the edge is or surface is not touching your picture plane, it is far away from your picture plane, so in this case draw the picture plane, then mark your station point, then draw the ground line, in that ground line take your front view or side view whatever it is given, then draw your horizon line, then from station point look at the left face, station point I am looking at the left face, it is going towards, draw a line parallel to your left face.

Where it intercept your picture plane you mark it, from there draw the projection, then this point will be your vanishing point left hand side. Similarly right hand side also you locate the vanishing point in the right hand side, so this is your vanishing point left, this is your vanishing point right, then once this station point is there vanishing point left and vanishing point right then, then you go for this if you look at here this edge, this edge is far away from your, this edge is far away from the picture plane of this distance, it is not touching.

You first assume as if this edge touches your picture plane, then start in that way what I do, here it has been extended back, here it has been extended back look at here, both these faces has been, edges has been extended back and it touches your picture plane, then that touching picture plane

you project it back to your ground line, then get back to your front view, project it back. So actually, actually this is the face, this is the surface you are getting considering as if it is touching to your picture plane. Once you get this line, this is your view of the edge of your which side, this is particularly I extend right side and project it back, this will be coincide with your vanishing point right side.

So I draw with your vanishing point right side, similarly consider second part, this part this has been extended, this surface has been extended and projected back so this will coincide with your vanishing point left, then coincide with your vanishing point left, then from this, then from this, from this, from this you draw a line up to your station point, then from station point project it back. Now once you project it back what does it mean? Now intersection of vanishing point left, intersection of vanishing point right, if you look at here this is your part assuming right hand side touches your picture plane.

This is your part assuming left hand side this edges touches your picture plane, so this you are bringing it back as if it is a true length projecting back from your front view. But actually this is not the case, the case is this side, this entire object is far away from this then from this edge you project it back. Once you project it back this, because this is your right face you join your vanishing point of your right, because this belongs to your left face of the left edge join back to your vanishing point of your left.

Then once you join you will get a intersection points, here you are getting, here you are getting this one intersection here you are getting, here you are getting another intersections. So then project it back your original point, the original point is this distance away you project it back so basically you are locating outer edge which is away from your picture plane. Once you locate your outer edge which is away from your picture plane then it becomes a simple.

Once you locate it with respect to that you project it back then what you consider, consider your left face different points, that means if I considering the left face this point, this point, this point it has to be located, right face this point has to be located, then again from right face to left face it is going towards left this point, this point has to be located. Consider this as I said it touches this,

it intercept your picture plane at this point, project it back then draw it because this is your outer, then similarly now I finish it. Similarly right face, then it joins your picture plane, then project it back this looks, then join it, then take your outer corner this corner, this is moving remember, this is where, this is actually the left face, this is actually the left face he is right.

Because I am moving from right face towards your left face, this is actually the left face because this part is your left face. So you project it back, then these projection has to be drawn along the line moving from right face to left face, you see this intersection point has come here, then join, then after joining then it become easier, then you locate your inside circle, this inside circle has been located, then draw it, then considering this as your diameter radius, semi circle you draw it, then finish this.

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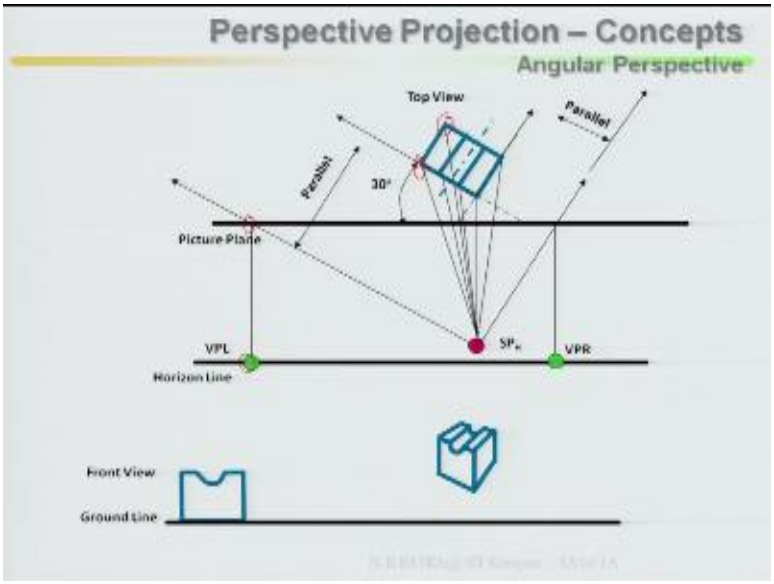

This is how you are perspective view it looks like, this is your concept of angular perspective in this case neither edge nor surface touching your picture plane rather it is far away from your picture plane, first you consider, considering as if the edge touches then you bring back your true length.

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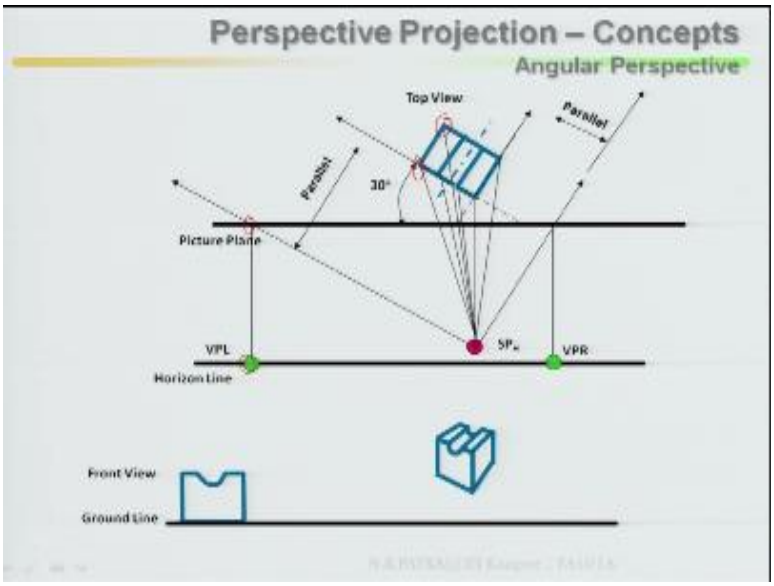

Then project it back, once you get this outer surfaces then go to your inner surfaces or inner edges and finish this objects. This is what up to this.

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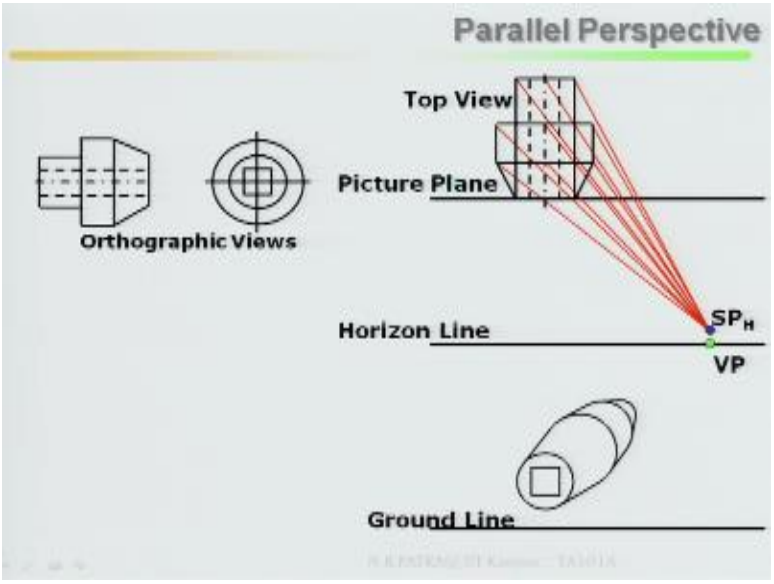

I have explained again I repeated whatever I have done it, last class few part because this you have to do, practice again and again then only it will come, remember in perspective view the error of doing particularly the mistake you are supposed to do has a less chance because if you follow the principles, left face, right face, and intersection of left and right then it will be much easier. Now come to the new one, circles in perspective.

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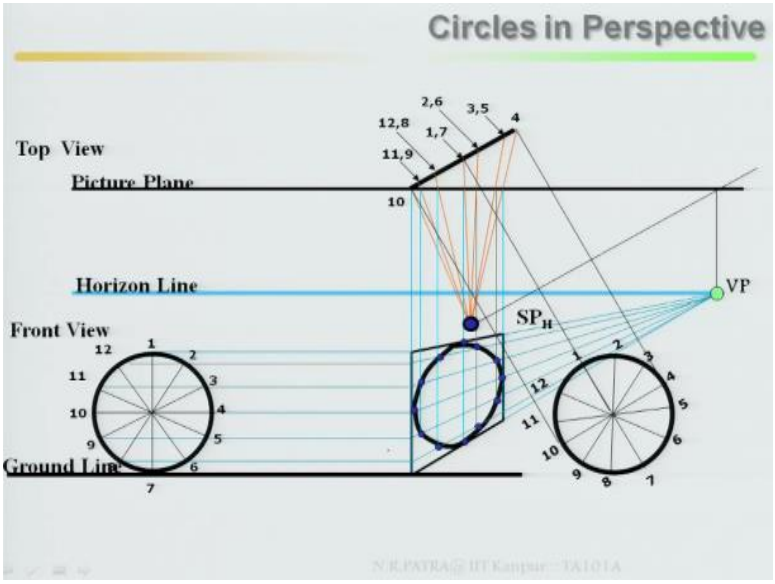

Picture plane, horizon line, ground line, front view, then look at your top view here, so particularly this is circle, if I look at the circle from the top this is my front if I look at this, this will be looking like line, so you divide into many number of points, here it has been equally divided into twelve parts, then project it back, mark the points if this is your front view of your circle and this is your top view, on the top view mark the points 1, 2, 3, 4, 5, 6, 7, 8, 9, 12 then locate your station point, now remember in this case point 10 is touching your picture plane that means this part will be in your true length. Then come to your – taking your station point, with station point draw a line parallel to this space because this is moving towards.

Draw a line parallel to that, where it intercept your picture plane draw a projection, then draw a projection. Then this is your vanishing point. This vanishing point is your right side, in this case only one vanishing point right side vanishing point. Then from here station point to join your point 10 bring back, this will be true. So particularly this is your ground line, this is your circle, then this circle has been divided into 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12 equal number of parts whatever you – earlier you have divided.

Then project it back, then you get this true part, this is your true it is touching. Once you get it then from this point go to your vanishing point, go to your vanishing point. That means entire perspective remember, entire perspective will be within this zone, it will not go outside. Generally students commit mistakes if they do not go by the principle of perspectives, sometimes it goes outside.

So this is your basic concept, once decide it vanishing point got the true length from there you draw a ray, arrays, this is your zone where your actual circle you want to locate it. Then from your station point mark it point 4, 3, 5, 2, 6, 1, 7 so first 4 has been marked where it intersect, then from there draw a line, draw it, join it. What I have done, I have taken two extreme sides 10 and 4. And clearly locate the boundary where I am going to show the circle.

Then other points you mark it, how it will be marked from here you mark it, from here you have to project it back. Then once it touches you join your vanishing point. Similarly, because if you look at here other point is your 11 and 9, from 11 and 9 you draw a line, this is your 9 is going touching here, this your 11 is touching here. Now it is going, these are the two points, now similarly come to 12 and 8.

Draw it from there 12 point project it back, draw to your – draw back means vanishing point you draw the line, locate your point, this is your 12 as well as 8. Similarly go for 1 and 7, 1 and 7 is your center at the center. Then similarly go for 3 and 5, similarly go for 4 last one you locate the coordinates of the circle. Once you locate it draw it back, now this is a circle or this is ellipse, this is ellipse correct.

Because it is a perspective, it is a perspective it will become twisted, because you are looking some view with an angle, because this is a typical case of angular perspective. It is with respect to some angle it is there, it is not touching entire circle is not touching. So if entire part is touching then it will be looked like circle. Here it is angular then it looks like this, so this will be ellipse.

So basically if you go by step by step there will not be any problem. So only three things is there, take as many as points here, if you draw an ellipse you take as many as points here in the circle, here 12 part it has been equally divided, you can consider also 24 parts. So then once it has been divided then identify your true length if it is touching, if not identify the length. Once you get that part then join your vanishing point. Once you join the vanishing point within that range, particularly from here to here with the vanishing point entire object will be here, it will not pass either of this.

So then as you have divided into dual part and project it back here one by one from station point look at it and point of intersection from your front view, you locate the same point here in perspective and mark it 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12. One it is, once it is over then join by means of smooth hand, this is typical case circles in perspective.

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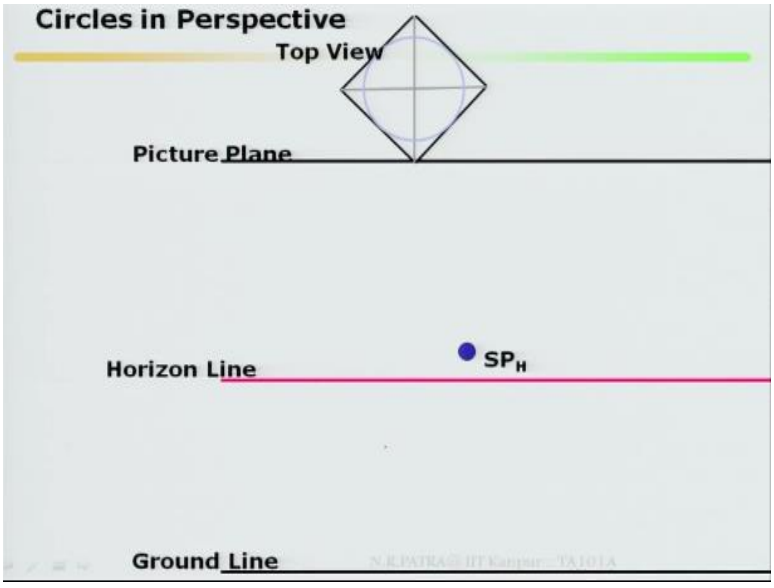

Another example I just rotate it, just I am just scrolling it down.

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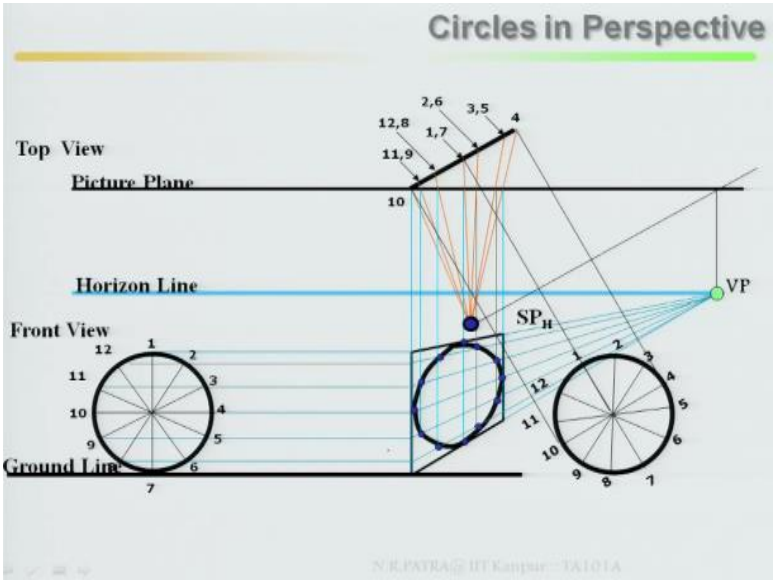

I have explain it, it is one case looking at the top view it is only one line of the circle, now looking at this other case.

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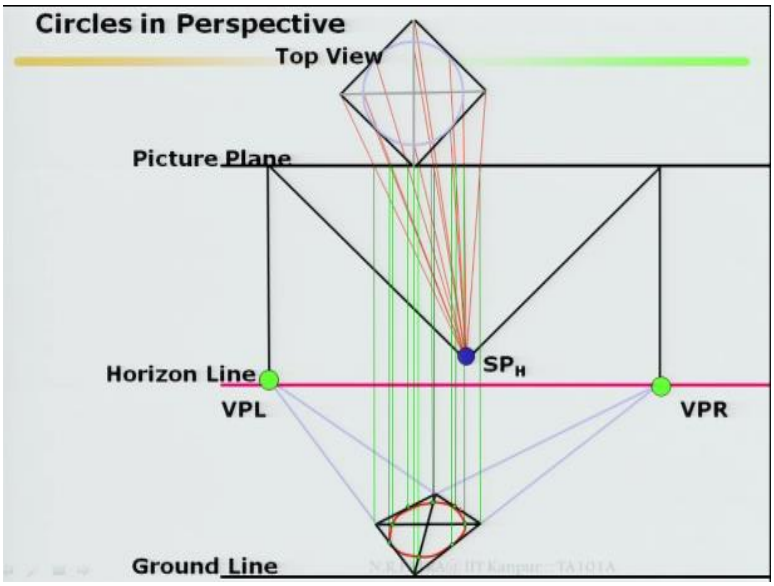

Ground line, horizon line, picture plane, what is this, rhombus? Then in between there is a circle now one of the edge is touching your picture plane, that means one of the edge is touching this picture plane means this depth direction will be your true length now let us see. So in this case this is an angular perspective, in this case how many vanishing point you are supposed to get it? It is a two vanishing points, with this surface from here draw here with this surface you can take it vanishing point left as well as vanishing point right, look at here vanishing point left, then once you locate it

Then from there project it back and from here join the vanishing point left, from here you join vanishing point right, then take it look at your outer edge you take it, both the outer edge you take it, join it, join it, then fix your area where is your circle supposed to be it has been fixed, now this is the area where your circle will be there, now outer face is over, now divide the inside one by one point you divide it. So take it one by one, mark the point, I have just consider here if you look at here how many points in the circle I have consider, if you look at here 1, 2, 3, 4. 4, 5 points you can divide it into number of parts, now look at here it has been projected back, points has been located. Second example it is a no more circle it is an ellipse.

How it looks, everything I have erased otherwise you can while drawing with a HB deep you mark the entire, clearly mark this circle here which looks like which is ellipse,, then other part with your 2H faint lines you can mark it so that it will be very clear what are the construction lines, so it will be very easy somebody can examine whether you have followed the right procedure or not, so then this object looks like this.

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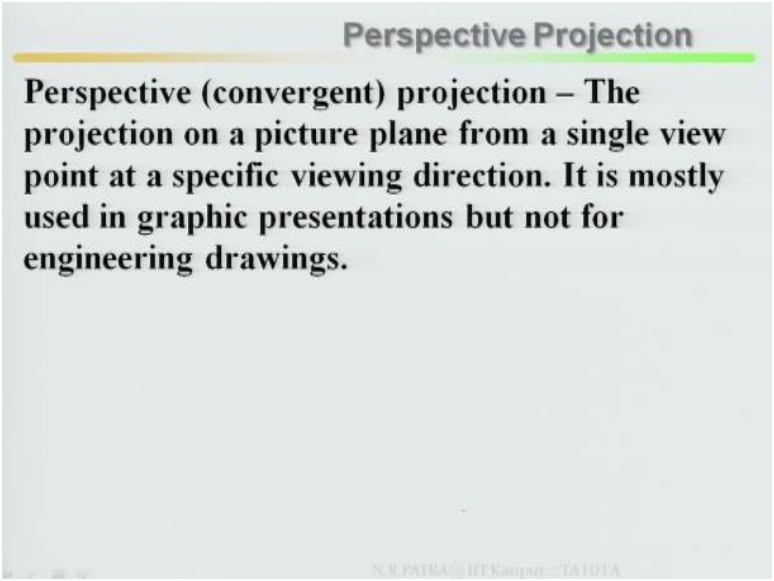

So perspective convergent projection, the projection on a picture plane from a single view point at a specific viewing direction, it is mostly used in graphic presentation but not for engineering drawings, graphic presentation, so up to this your.

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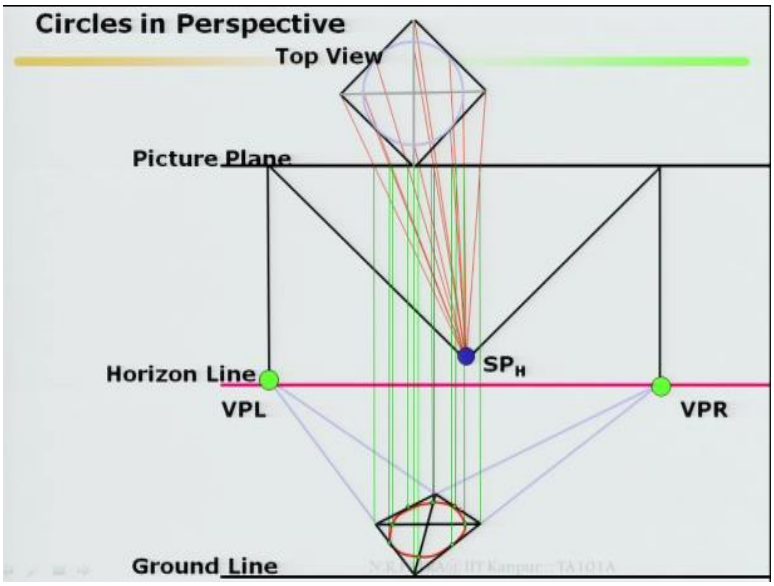

Circle and other part.

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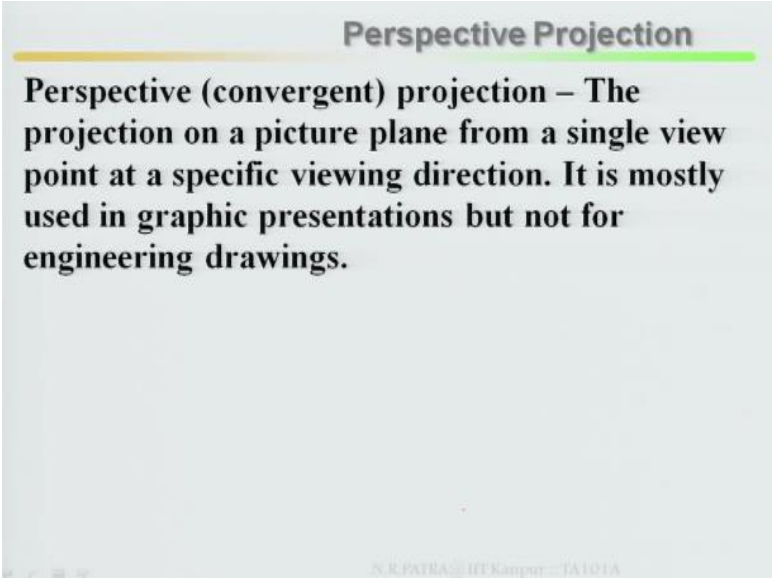

I have covered now

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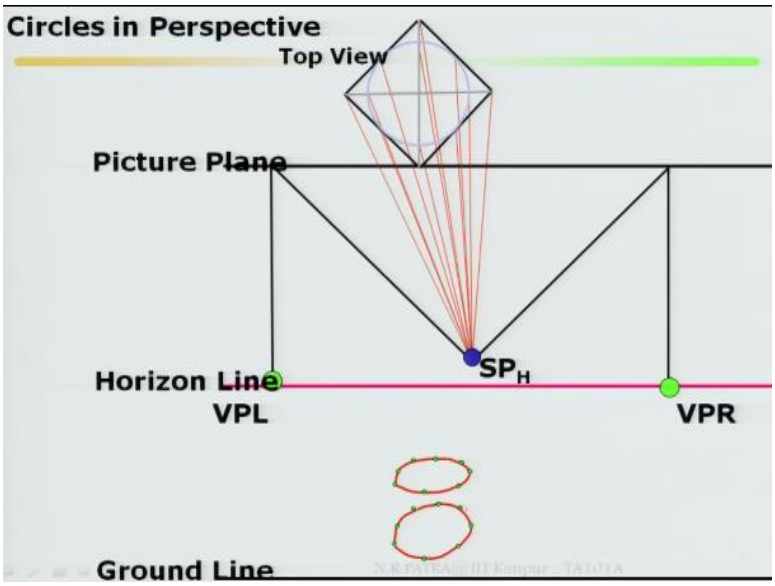

Few cases I think I have explained you few cases, this is the case typical one of the example I want to explain it, circles in perspective if you look at here, ground line is there, horizontal line and horizon line, picture plane, there is a rhombus station point, vanishing point left as well as vanishing point right.

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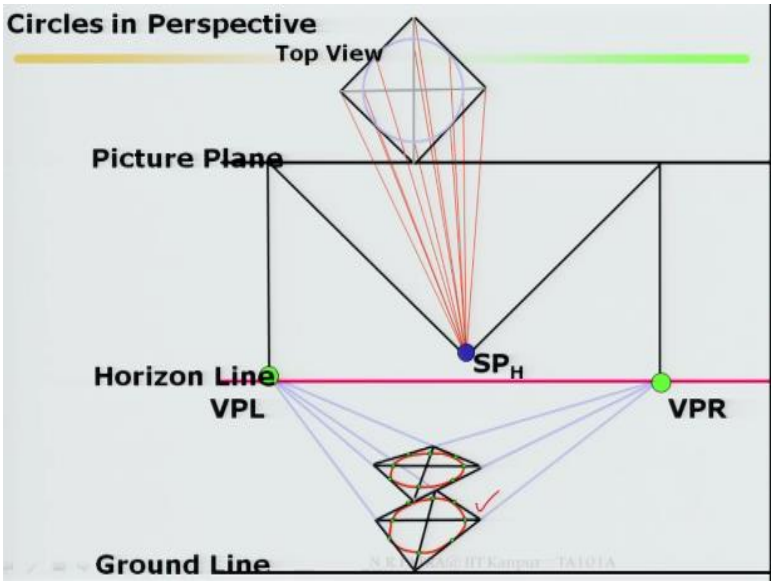

Now look at this case, this case you look at, what is the difference with this case, what is the difference? In this case what happen I just plot it, in this case what happen, this is touching so this part will be true but second case may be possible, this may be not touching it may be far away. So both these cases I have shown you, one is far away other case is touching. So both these cases it looks like it is ellipse, it is an ellipse.

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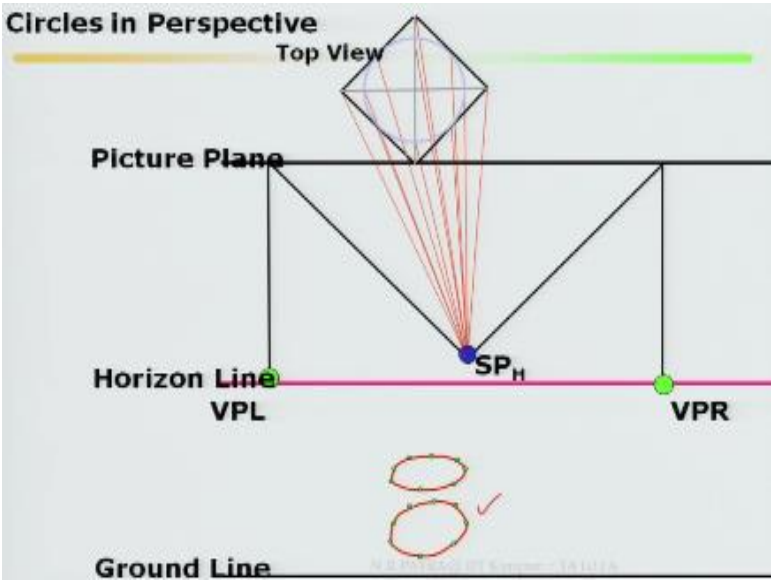

So how twisted, more you go far away once it touching looks like circle distorted to ellipse more you goes, goes far away look at this how it has been compressed.

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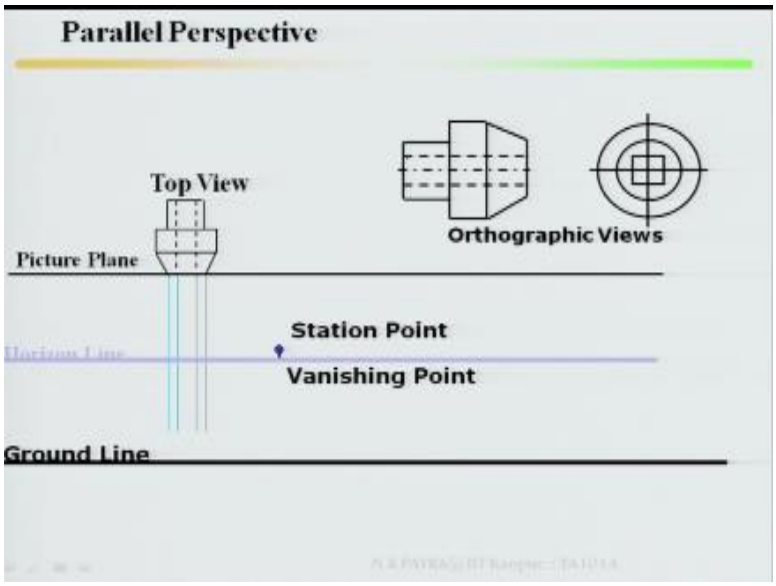

This I have explained also earlier just I am showing it, in this case what happen? This is your orthographic view, picture plane, horizon line, ground line, what happen? Top view one face not edge one face is touching in your picture plane, that means that face particularly it may be four edges completing true length.

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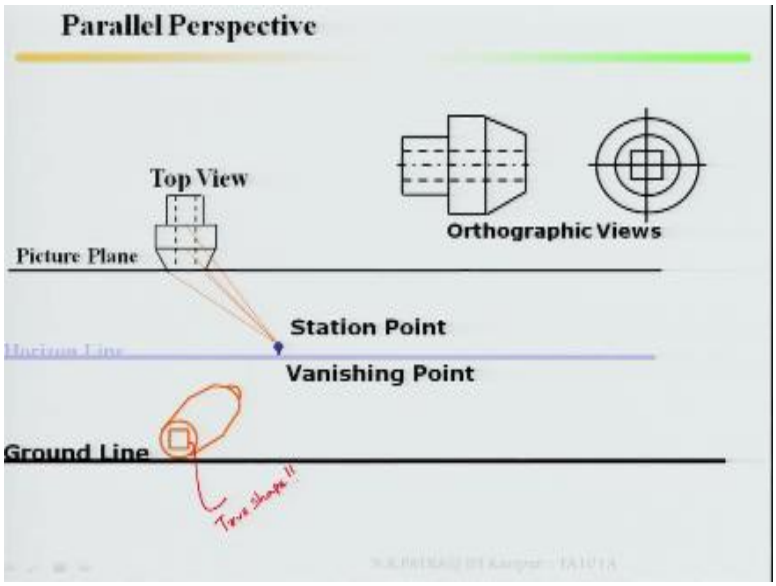

If you look at this face is touching your picture plane. Start with this, this is your station point, station point then vanishing point, bottom face this is touching that means this will be in true length, this will be in true length, not true length I can say it is a face true shape, it is in true shape. Then with respect to vanishing point take it one by one, do it, how the object looks like. So this is in true shape. Other part is inserted because it is touching in your picture plane.

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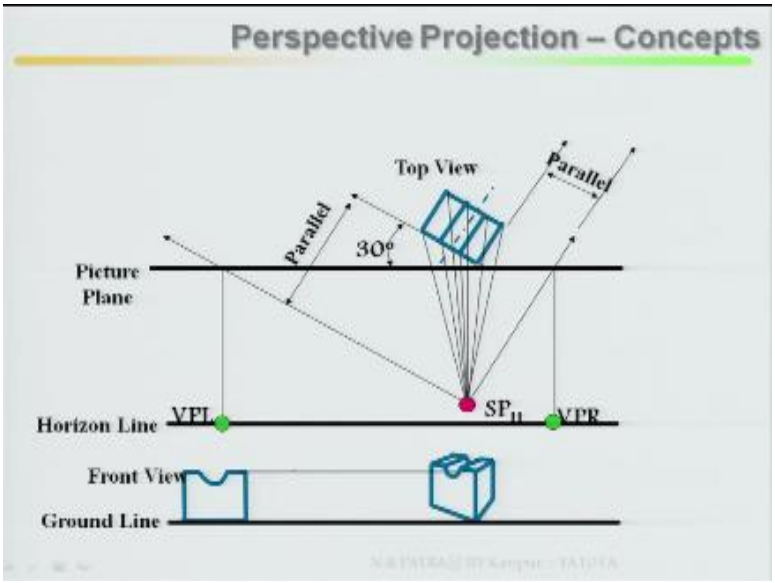

This part I have explained. So there is no point to explain it.

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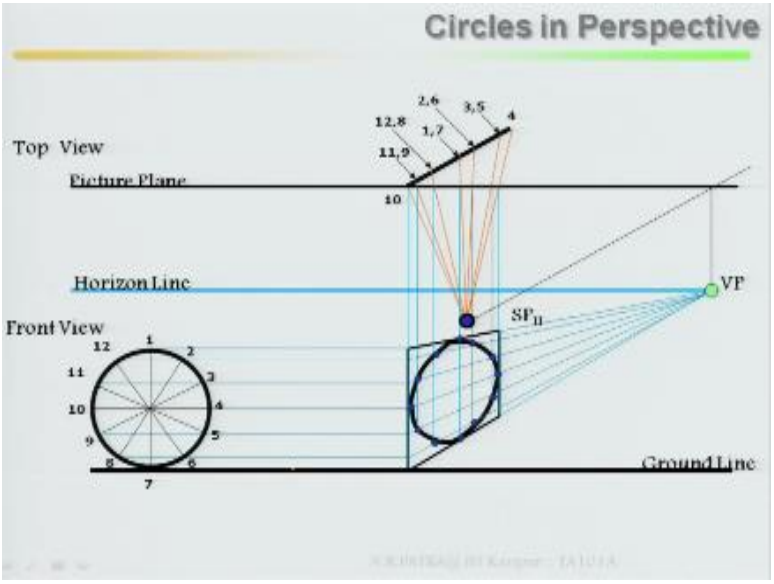

Few examples I am repeating, this part also I have explained so it is okay this part. Whatever I have done it this part I have explained, what my request to all of you, you try your hostels and redraw in a piece of paper.

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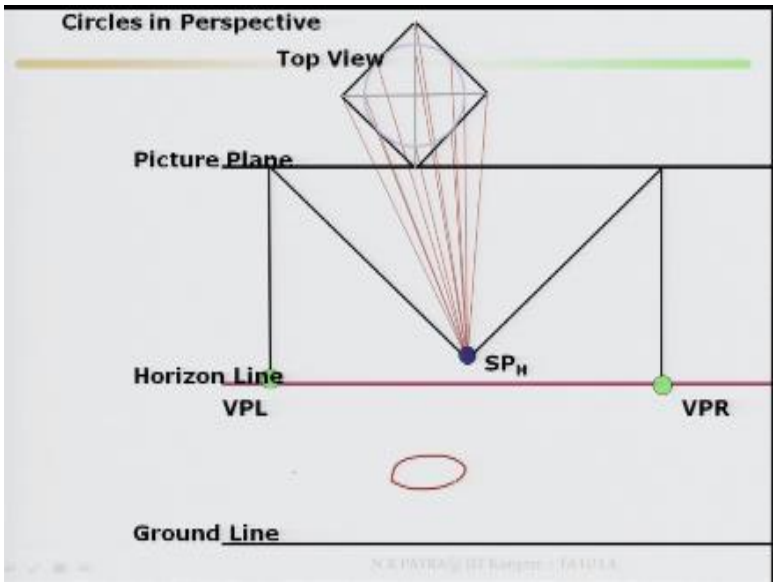

So that it will be clear to all of you what you are doing, this is all about your basic perspective and few examples of your perspectives

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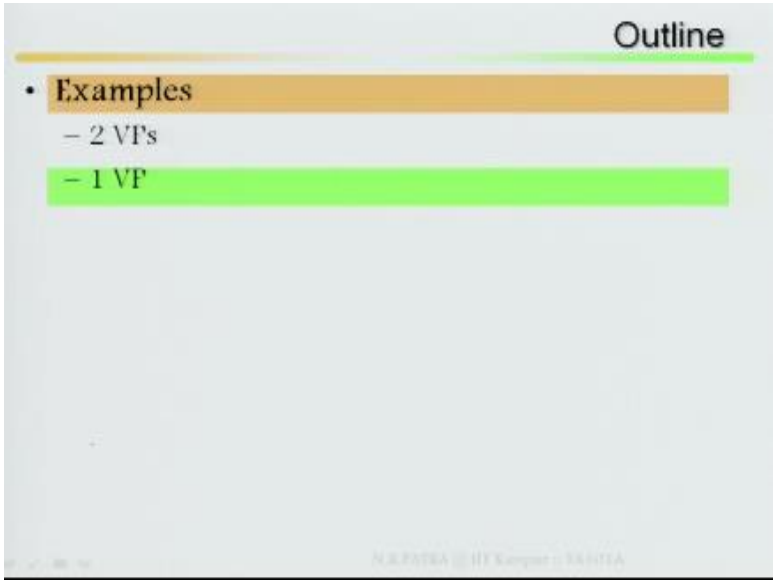

I will explain few more examples of two vanishing points as well as one vanishing point and some cases of three vanishing points.

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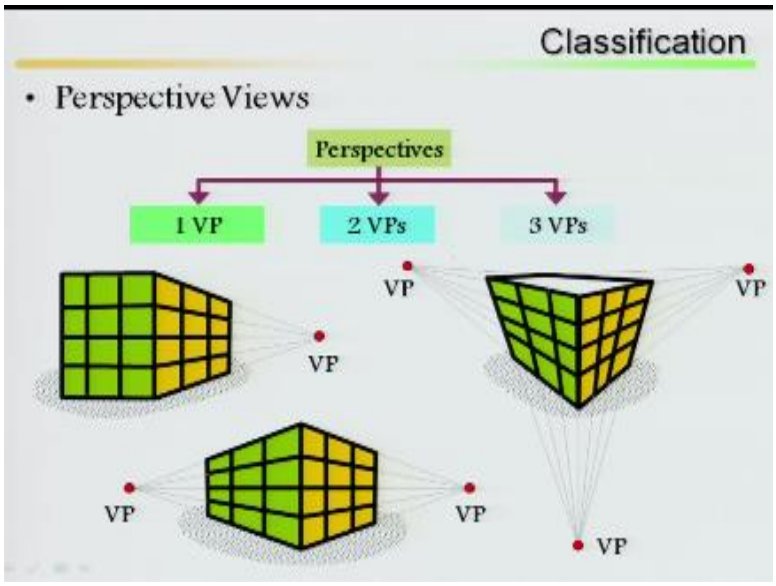

So if you look at here as I said one vanishing one point in which case? If it is parallel completely and particularly angular projections, angular perspective this is angular you are making isometric so that I can look at this objects. In this case also two vanishing points sometimes in angular, three vanishing points are required it depends upon how you rotate it.

If you rotate it if you are looking at the two face in two parallel directions then you will get it two vanishing point, in this case I am looking at the three faces, one is here, one is here, then other is one is going this direction, this direction, other is this x, y and z. So three vanishing point will be there.

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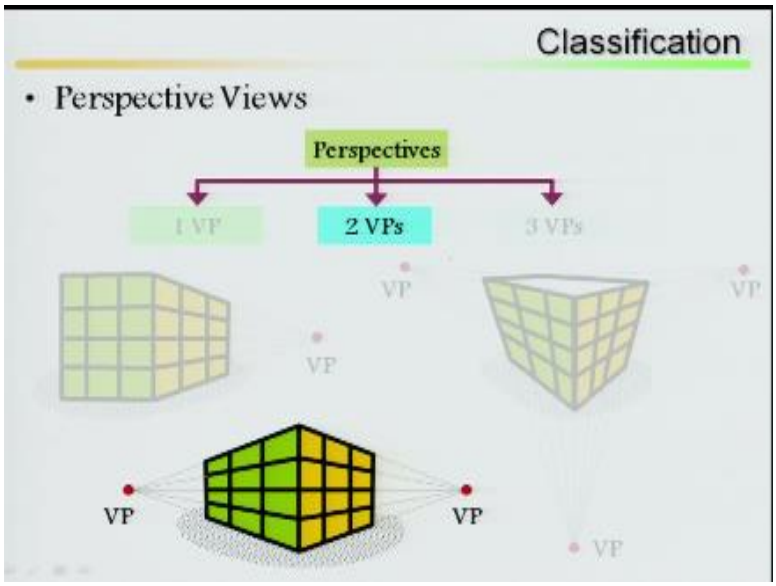

This is your two vanishing point.

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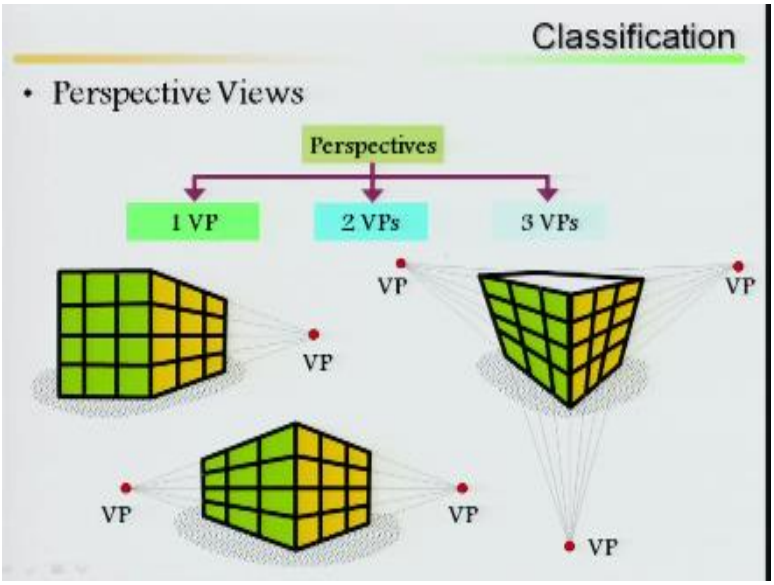

One vanishing point, two vanishing point, then three vanishing point.

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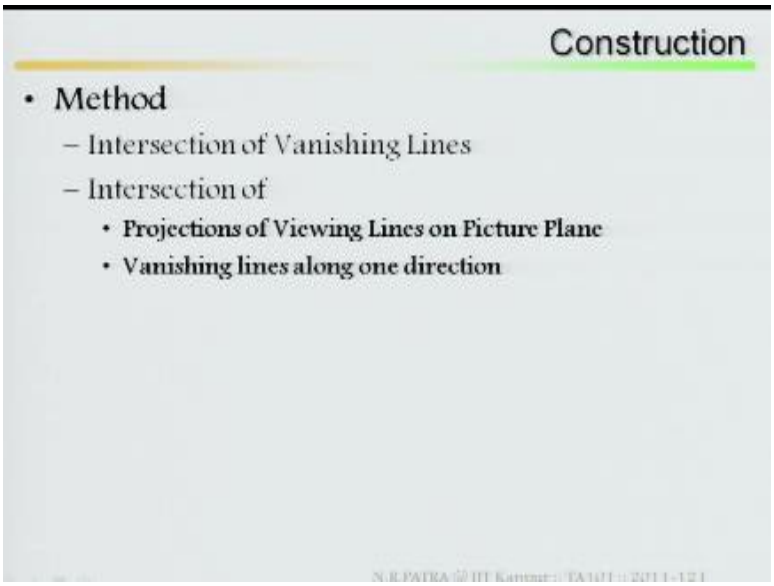

So method, intersection of vanishing lines, intersection of projection of viewing lines on picture plane, vanishing line along one directions. There are two methods projection of viewing lines on picture plane, vanishing lines along one direction which I have explained you also earlier.

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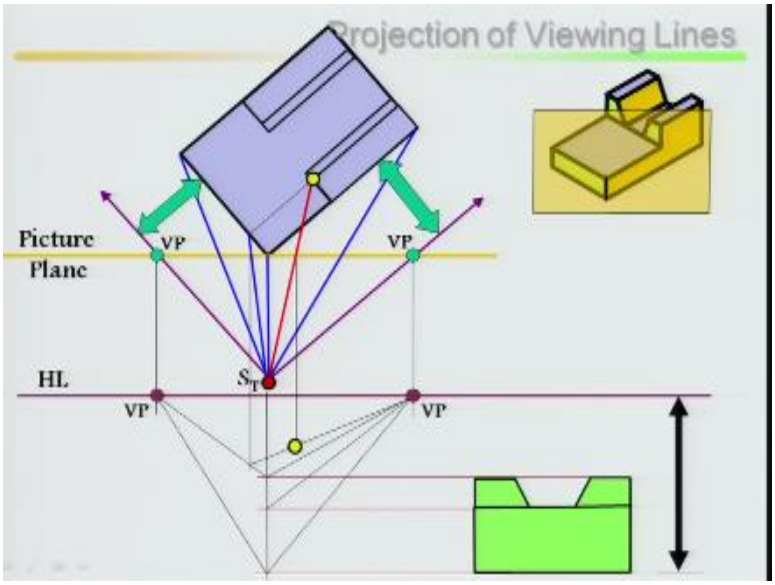

If you look at here station point there are two vanishing point, station point parallel to here, parallel to here get the vanishing point one left, vanishing point right, then intersection point you do it. I will stop it here.

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So next class I will start few examples then go to space geometry. New part is your space geometry that is a long syllabus it will continue, at the end then will go for AutoCAD, few cases AutoCAD we will solve here, how it has been implemented from the drawing sheets to AutoCAD means computer based design particularly in drawing that will be at the end, thank you.

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