Engineering Drawing and Computer Graphics
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Module – 03
Lecture – 29
Orthographic Projections I (Part - 9)

Hello all. Welcome to our NPTEL Online Certification Courses on Engineering Drawing and Computer Graphics. We are in module number 3 and lecture number 29 on Orthographic Projections.

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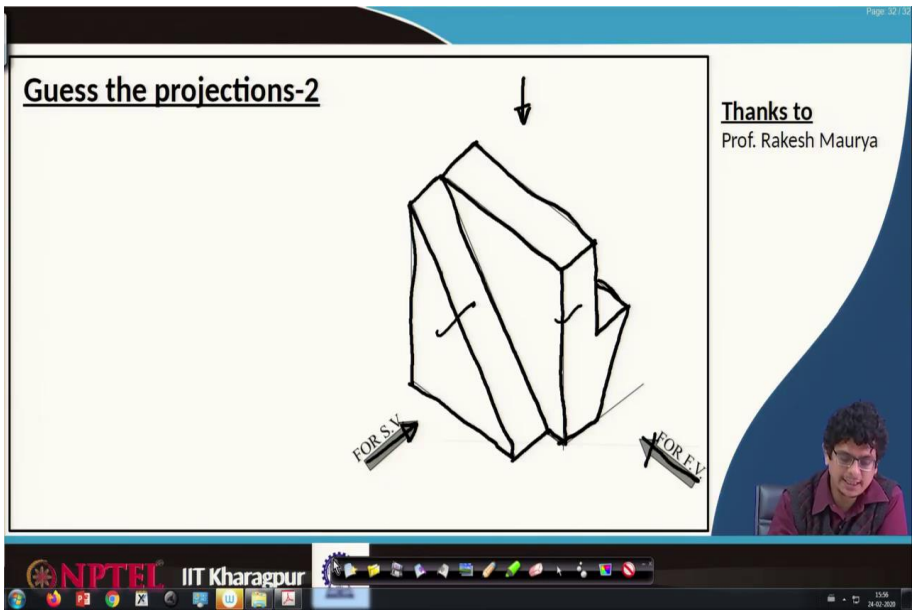

In the last classes, we try to look at three-dimensional objects and their projections and we are going to continue that projections observing how to draw the things. Let us look at this three-dimensional object and we have to guess the projections. The object is we have something in that way, an incline cut in this way.

You can think of it like two portions in a very nice way, a triangular piece. This triangular piece attached with another rectangular piece having something like a platform and further object, this is the front view given and this is the side view given; so, the top view will be that. So, let us guess how this front view side view top view looks like.

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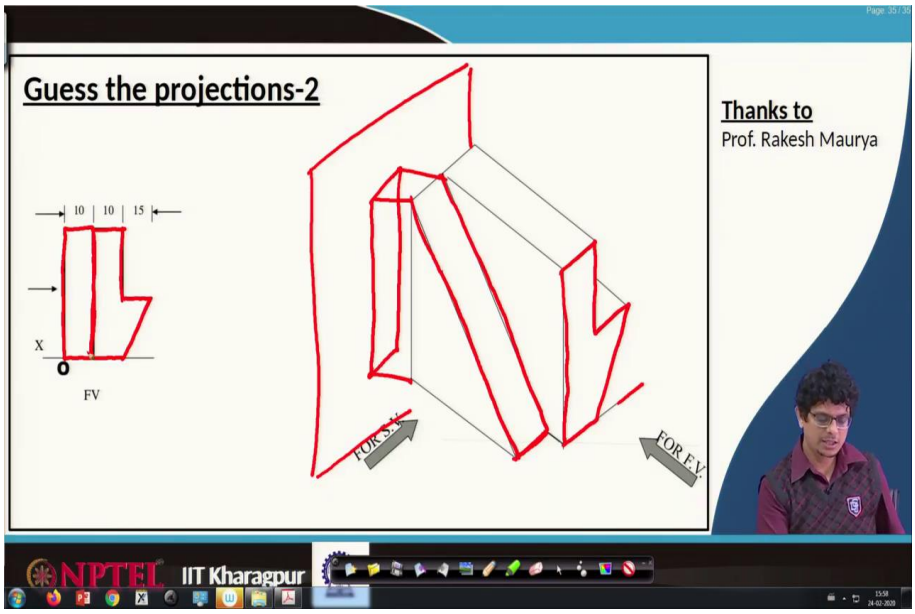

Let us look at front view. When we are observing from this direction, the things what we will observe is; so, I will highlight the things, what we will observe. This line we will see. Let us use another colour; this line, we will see. Again, this line, we will see on this incline thing naturally, we will see this baseline also and this one we will be in a portion to see, this line, this, this entire thing.

That is this platform more like a seat and this line here. Now, these two incline lines, we are observing it on this plane. So, this point projected there; this point also projected there and this entire line points will be projected from there. That means we will see it something like a vertical line. So, those vertical lines are these. This is the way we observe that front view of that object. Now, let us look at the side view.

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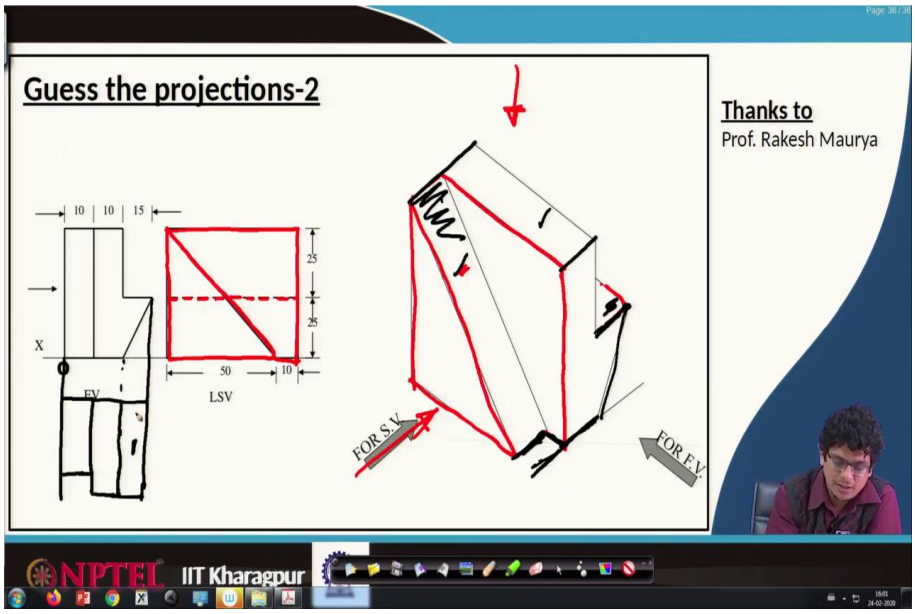

For side view, if we are observing from this direction, we see this bottom triangular portion; this entire thing is mapped on to that region. So, the triangular portion will be that. We will be in a position to see this horizontal line, this horizontal line, this vertical also we will be in a position to see and this one. This is the way we observe and this entire line will coincide with it. We will not be in a position to see this backside portion and this line.

That means, these back side there is an object, so we show it by dashed lines. What will be the top view of this object? So, let us guess that. So, the top view comes at the bottom level that will be the projection of these lines. Now, top what we are going to see is there is something like this part, we will see and this part, we will be in a position to see; that means, this one. There is something like an inclined line also goes.

So, there is something like this part also will be in a position to see; that means, this part naturally comes at that stage in that way. This entire incline portion, we are about to see it something like a projected rectangle. Up to this level. Here, we do not see any portion. So, if I am drawing it up to this portion, we will see something like that and this portion, we will be in a position to see like a projection like that. Then, it goes up to a certain level up to that base.

And this one supposed to get coincided and this part coincide up to that level. So, whatever these horizontal from the top view, if we are looking at it, there is an entire thing projected there. So, here this part is there, this part we will observe it in that way and this extra portion, we are going to see all the way there. This is the way this flatform kind of thing we will see it here because it's going in a tapered direction, we may not be in a position to see only that.

So, there should be a line which joins this part to that part, this part joins with that part. This is the way we observe the top view of the object. So, if we are erasing it, this is the way top view looks like.

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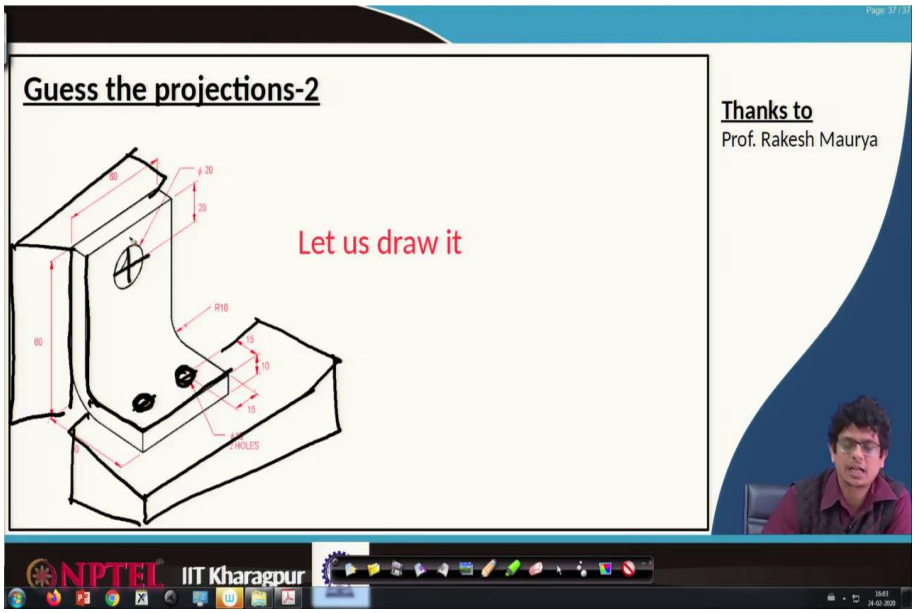

Let us guess projections for this object. So, it is an L angle kind of bracket which usually for doors, windows, other things, we use it. Fixed one side with the other side; something like corner edges, we would like to fix it. How to do that? For that purpose, we use this kind of mechanical element. So, it becomes a bit sturdy. Usually, we will be having bowls here, screw it. So, it will be tightening the object either on the top or bottom side of that.

For example, I would like to connect this wooden block with this is the wooden block, which I would like to connect it with bottom side one more wooden block. This is the way, I would like to connect it. In that case, I use holes here, drill it, make screws; similarly, connect one more screw there and connect it. For that purpose, we use this kind of bracket.

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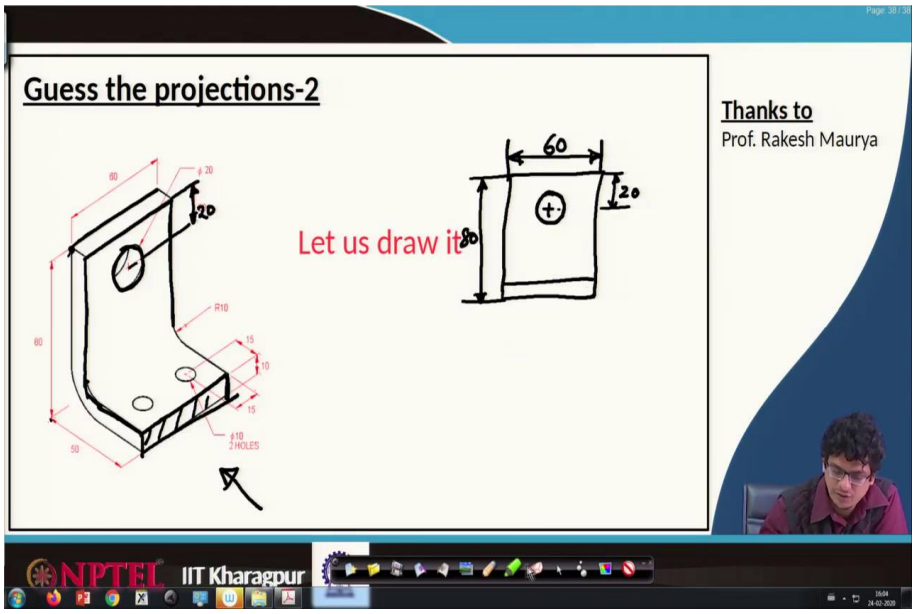

So, let us look at this from the front view. If this is the direction for front view, what we will see is sure we will see these lines and similarly, we will see these lines and this line goes all the way there and there is a projection of lines, we will see that up to this portion. So, if we are drawing it as a front view, what we will see is this, where here this entire length is 80. So, this will be 80 lengths and this one is 60 units.

So, here we will see 60 units, there is a hole which we will see in the front view. There is a hole which is at 20 units down. So, centre, that will be 20 units. These holes we do not see; but here this rectangular patch, we will see which is at the bottom. So, this will be that rectangular portion what we see for the front view holes are there.

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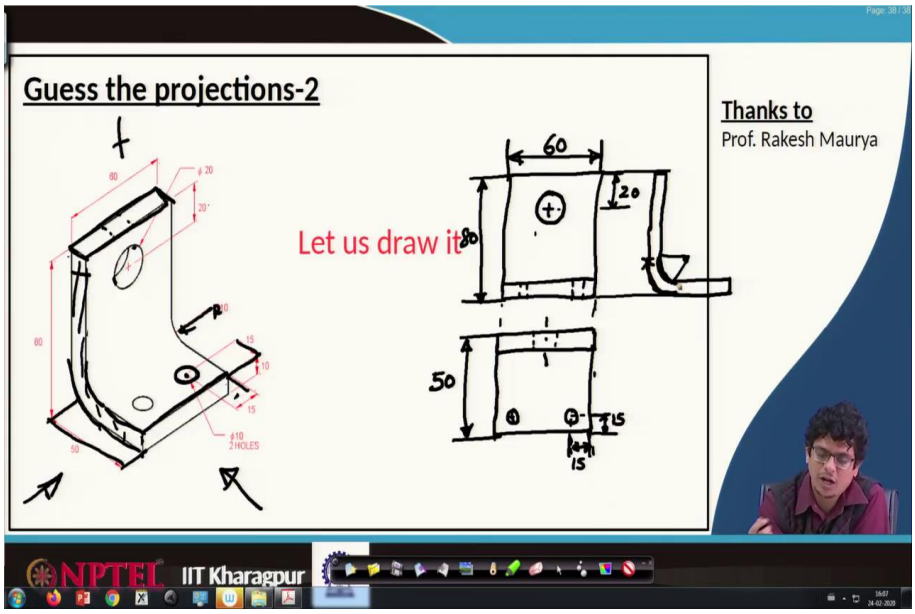

So, wherever holes are located, we just show by dash lines. Let us look at from top view. If you are looking top view, these lines are bounded. So, it is supposed to be bounded by these lines. On the top view, we will be seeing this small rectangle. So, that small rectangle always is there. All these things projected. Again, it goes all the way there.

So, from top view 50 dimensions, we will see a rectangle. So, if we are seeing this because this distance to this distance is 50. So, up to 50, we will see this kind of thing and we will be in a position to sense these circles which are at fifteen distance. So, there is one circle, there is another circle and centre supposed to be 15 and this centre to this edge is 15.

So, again, here we see 15 extension lines plus and there is a circle which we may not be in a position to sense, but that will be having a projection here. So, it goes all the way there. This is the way we will see a top view. Now, if we are looking a view from this direction, what we are supposed to see is this L portion, we are supposed to see. So, it goes in between these lines whatever the thickness here, that thickness we will see something like this, all the way goes. At the same time, the bottom we will see that bottom also whatever that length, we will see that these are perfect edges and there is an arc.

This is the arc. What we have to do? That arc 10 radius is given. So, that arc one has to join it. So, once we fix that radius from this point arc 10, arc 10 centre we know, then connect by radius use the same centre. Locate this point, draw one more arc. This is the way; we can construct the side view.

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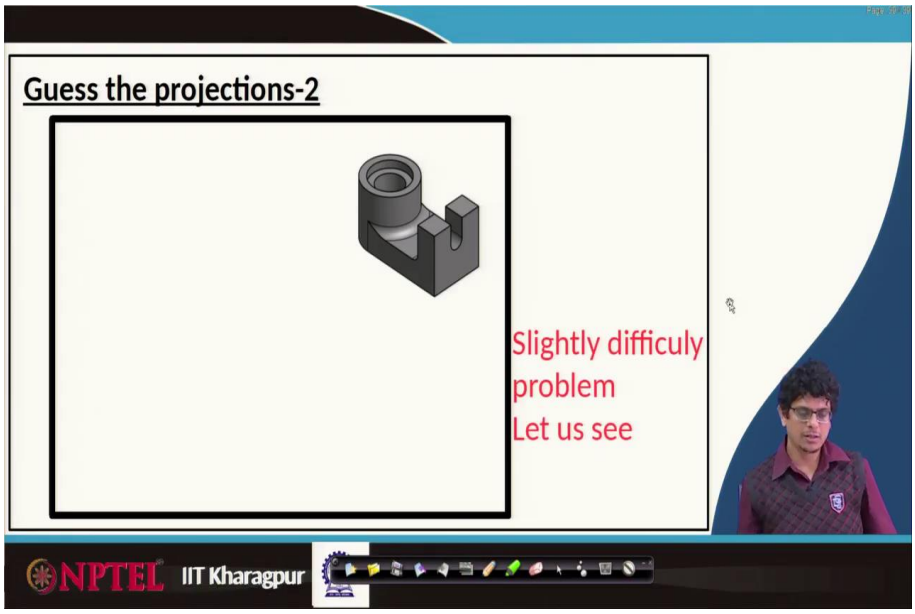

Let us look at this slightly complicated object. This three-dimensional thing, what we would like to construct if dimensions are given.

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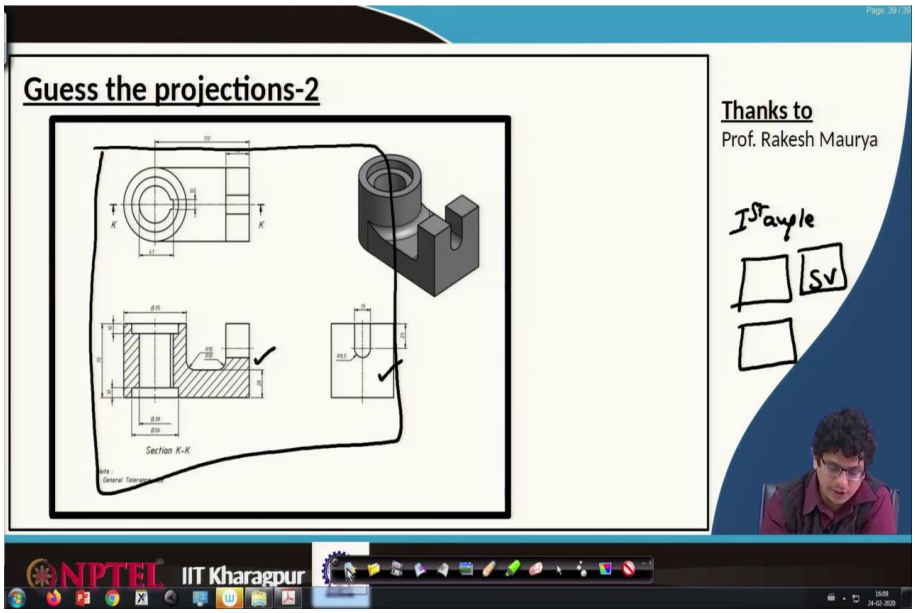

So, if we are looking at it. If it is third angle projection or first angle projection, the things what we will see is something there should be a front view, something supposed to be the top view, something supposed to be a side view. Here if you say seeing the first one, for first angle projection, the front view, the top view, next to front view, we will have a side view.

Now, where exactly we have this side view? The side view is on this side and what we know is next to front view, we will be having this side view. If that is the case, this cannot be this drawing whatever the drawing we have, that cannot be a first quadrant projection. It must be third quadrant projection, let us look at it more carefully.

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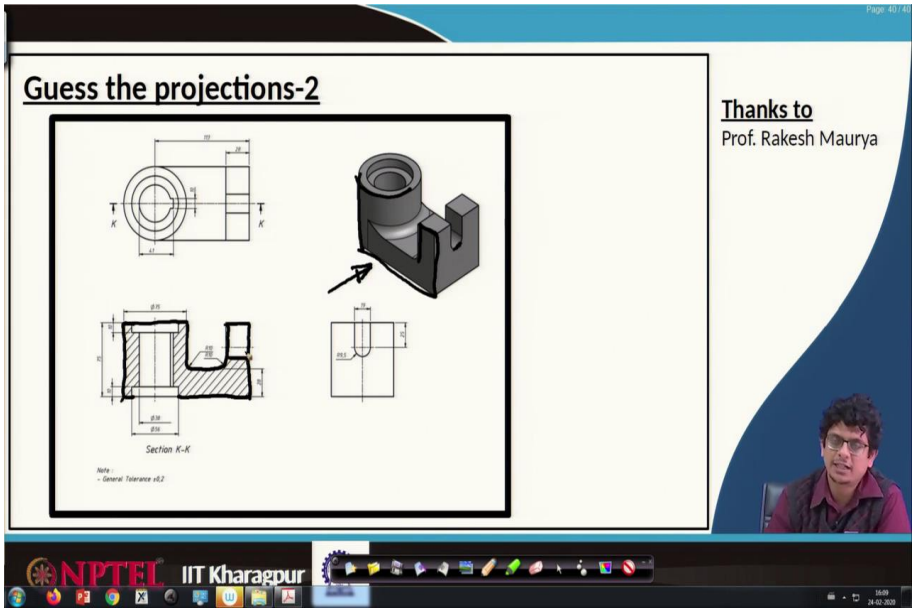

Let us consider the front view of the object is this one so that we will see these ends something like a rectangular block. This is the thing, what we will be in a position to see that which comes as a circle, but here a rectangle. So, this must be a front view.

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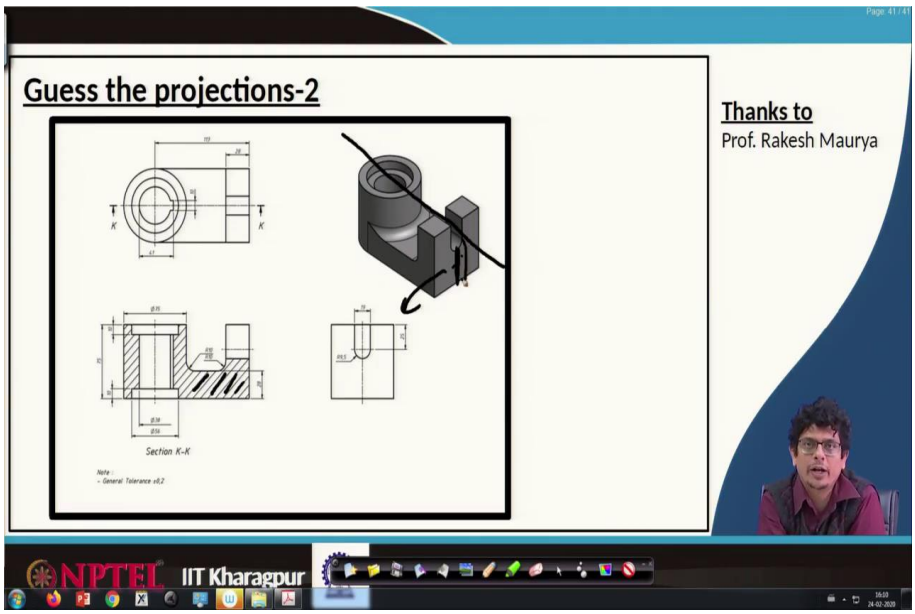

We have these kinds of cut which will be projection as that. Remember for any drawing whenever such kind of incline lines are there; that means, it is a cut sectional view. Usually, we cut at the centre middle, remove the first part, the remaining leftover portion, we will show it as a cut section. This cut section can be at middle, it can be at the edges also, usually, we go ahead with.

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But the standard convention is have cut section at the middle, remove the front part, the leftover backside part, have projections and visualize it. Because it is a third quadrant projection. This after cut whatever this centre one projected on to that. So, we will have the material element there. This is what we call hash; hashing in this drawing indicates that these are the cut section.

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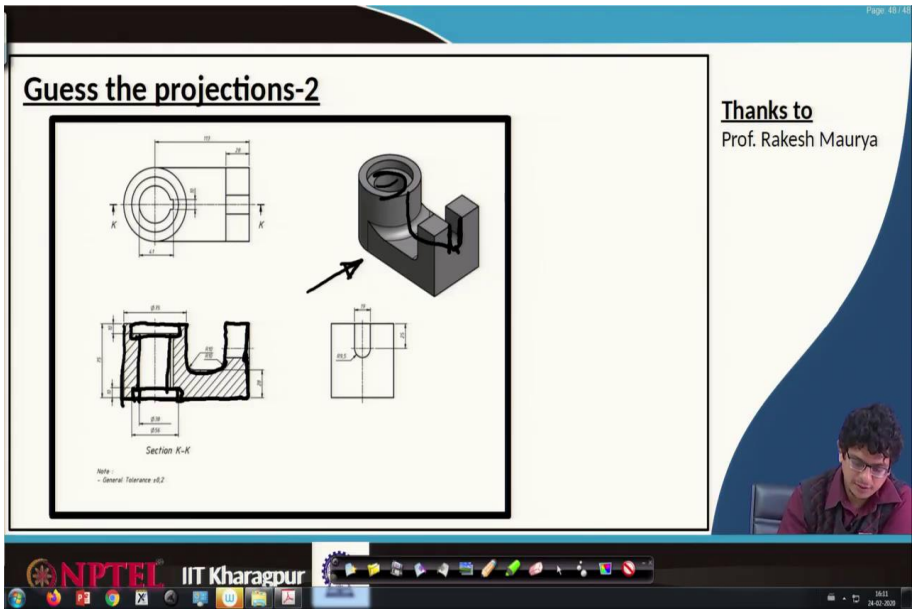

Why we have these cut sections is to visualize complicated internal parts. For example, if it is straight away visualizing it, what we will be having is only this part. We do not know whether there is something like scooping out inside of that material or not.

To have that kind of more information, usually, people have that cut so that indicates that there is something like this kind of cut what we are going to have. So, let us look at that carefully. If we are having a front view, this entire portion comes out in that way. Here, there is a hole which goes all the way down.

So, we have these extra portions. These circular portions what we have like a hole. Similarly, this portion has a curve that comes in that direction. So, that portion comes curve and goes all the way up; so, we have that portion. And with this small u kind of portion, we remove the top portion. So, we will have this material comes and semi-circle comes in that direction.

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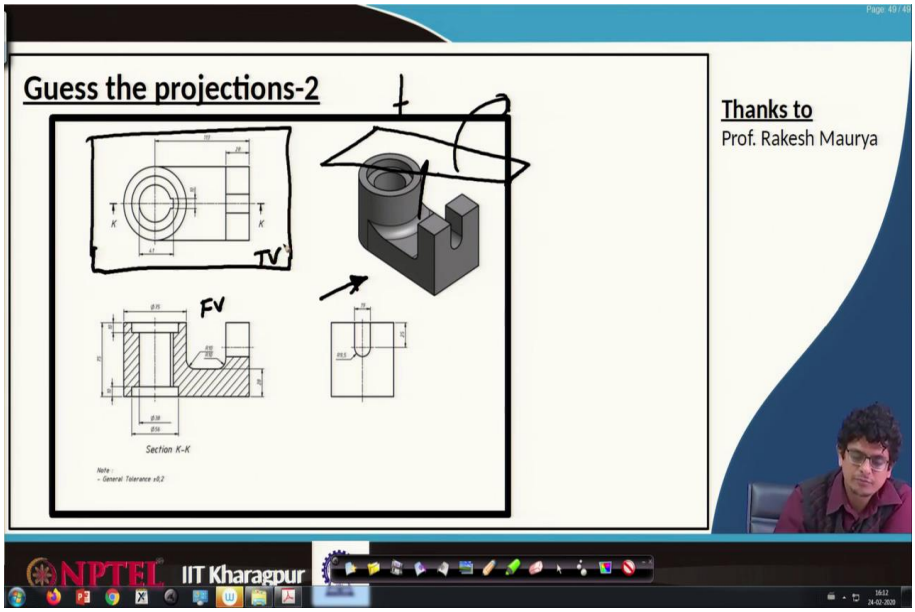

Front view projected onto this front plane, so this is the front view. Top view, from the top, we have to look on to a plane which acts as a mirror. So, whatever projected that if we unfold it, it comes there; so, this is a top view. So, let us look at this carefully. Usually, for front view only we will be having that kind of cut section. Top view, we do not have to make any cut to visualize that because the entire internal part is visible.

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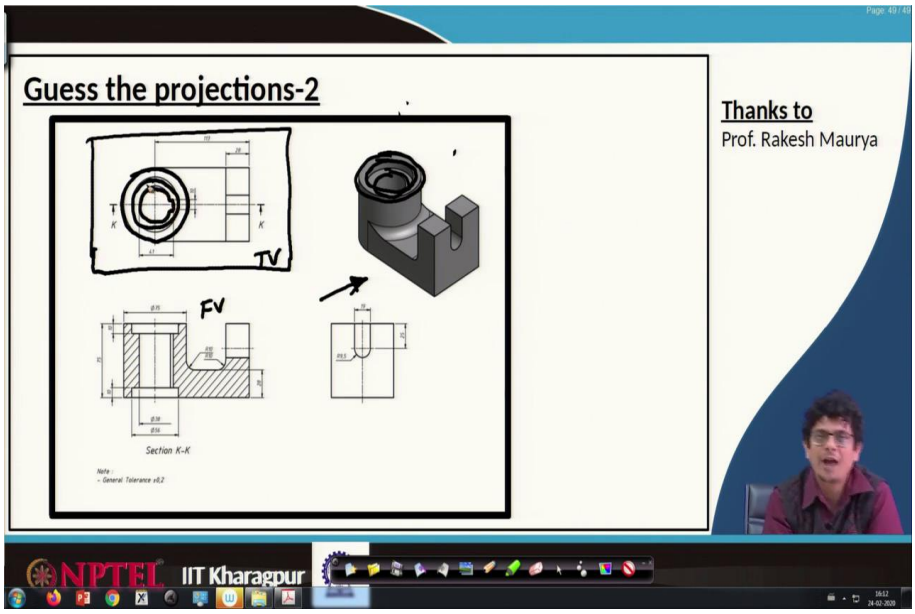

For that purpose, we have this complete one, this one; this complete one also we can visualize and internally, there might be a groove key kind of thing. That is the reason, we have this kind of projection. If we have it only, we will be in a position to draw it. For this object, it has; that is the reason, we have that key. If there is nothing, it will be straight away connected in that way.

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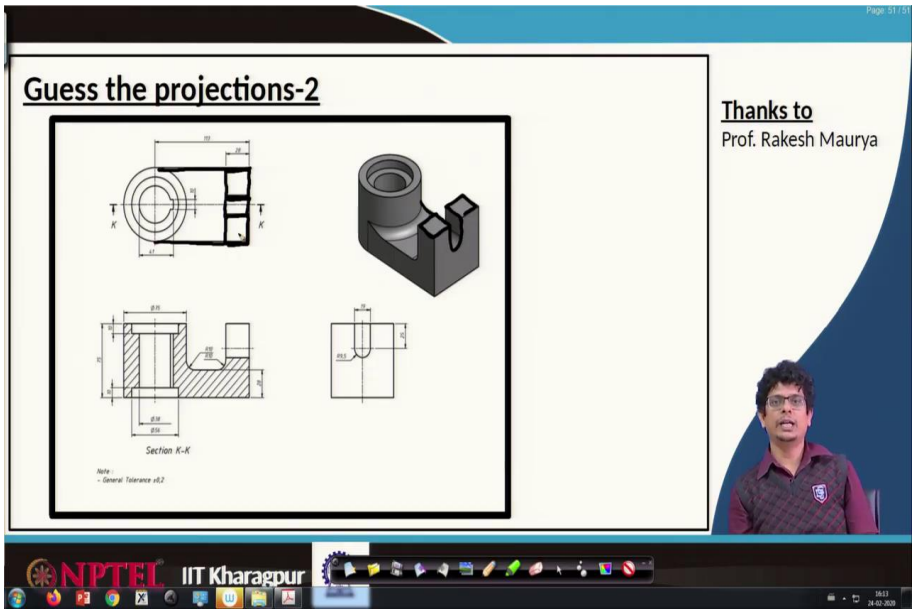

And we can see there are rectangular blocks. So, those rectangular blocks are that and this portion like a groove, we will see something like two lines and this entire part, we see it like connected by that point. This is the top view in the third quadrant projection.

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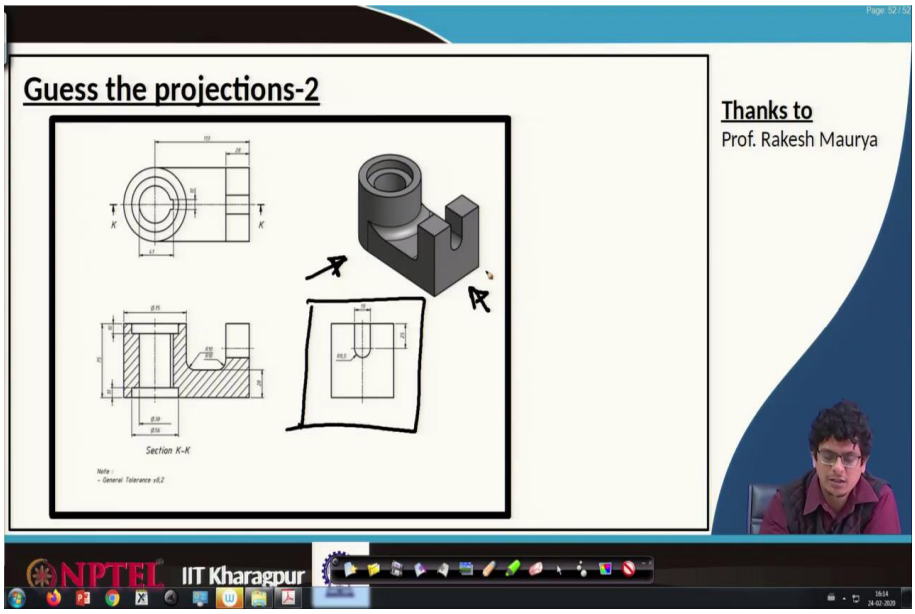

Similarly, if we are looking side view, in third quadrant projection, the side view on the right side is the right-side view; that means if you are looking from the right side of that object whatever projected onto that mirror that is the thing what we are supposed to take it. So, this is the front view. We are looking from the right side of your hand which map down to that mirror.

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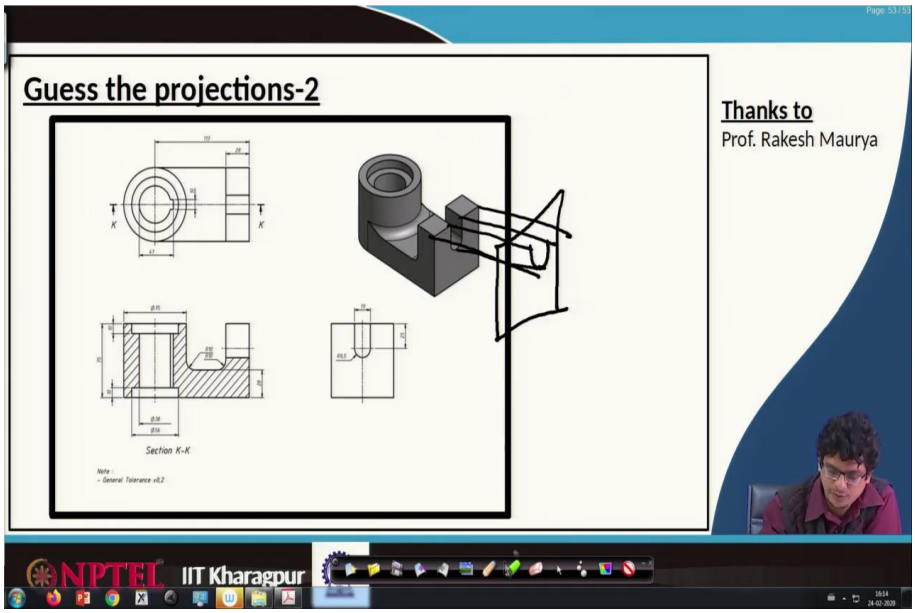

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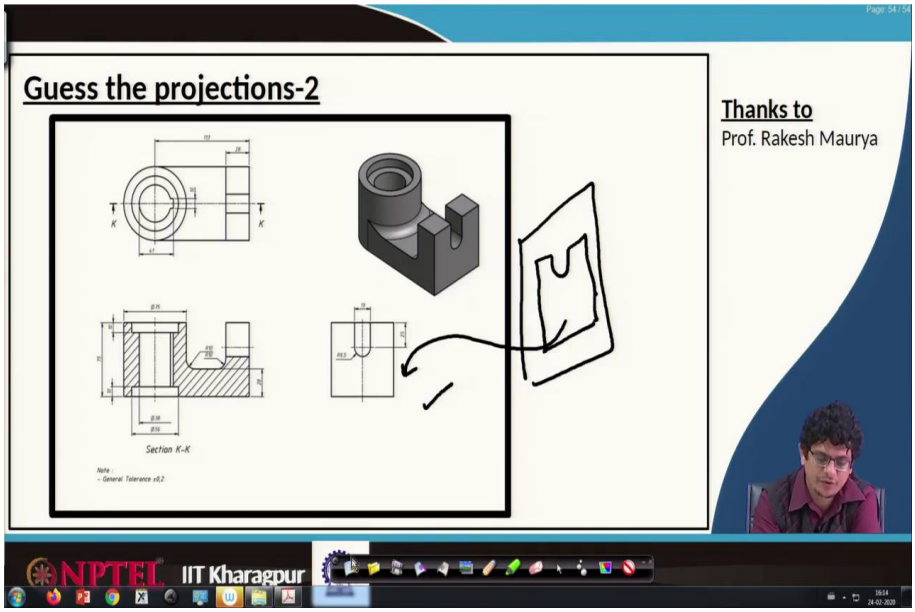

So, on this plane, we will see groove in that way.

So, this is the way, we guess the projections for given 3D objects isometric views and in next class onwards, we will look at more details about Orthographic Projections like lines, planes and other things and that is part will be a separate module.

Thank you very much.