Computer Aided Engineering Design
Prof. Anupam Saxena
Department of Mechanical Engineering
Indian Institute of Technology, Kanpur

Lecture -3

Welcome to lecture 3 of NPTEL video stills on can to repeat the selectors.

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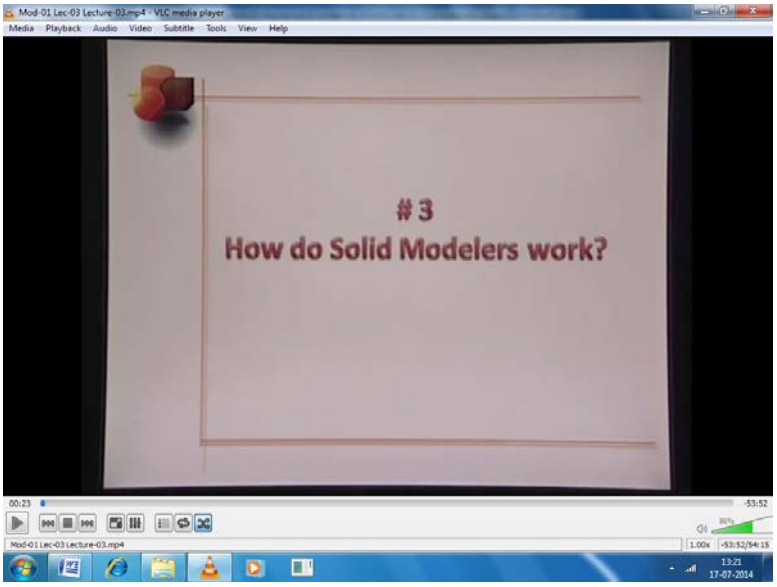

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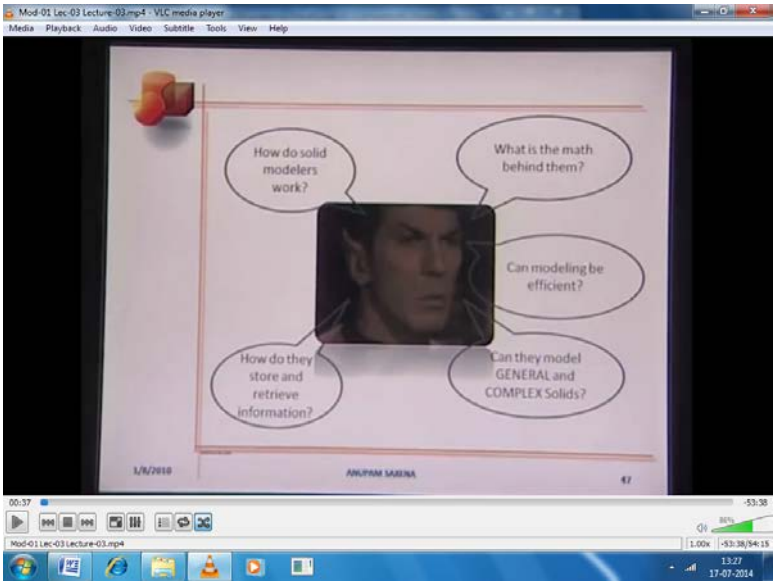

We have seen how form of different products can be invented and represented using paper pen approach or solid model an implicit mind has also put force following quarries.

Question 1: How do solid modellers work?

Question 2: What is the mathematics behind the graphics?

Question 3: Can solids be generated efficiently?

Question 4: Our solid modellers capable of modelling for complex solids and finally the fifth question is denies storage are retrieving efficiently.

We will start by refreshing briefly the procedure of form design. We will then study some properties of solids in detail.

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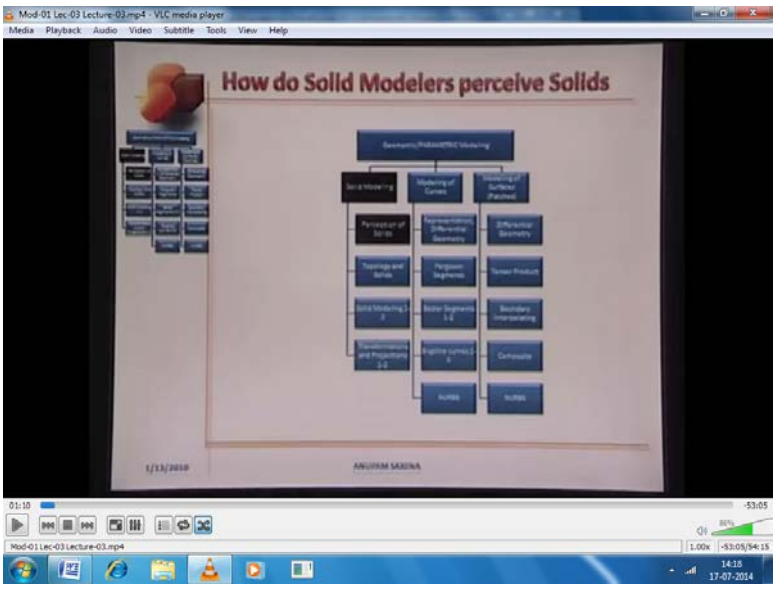

We still trying to proceed solid to refresh. The starting point in a designed procedure is to figure out and come up with the functionality of a system or a component. One makes a wish list. One can also survey talk or ask a lot of people. The list can be asked elaborate as possible. And then one can choose critical item for form generation. One can then come up with many forms satisfying a set of items chosen from the wish list.

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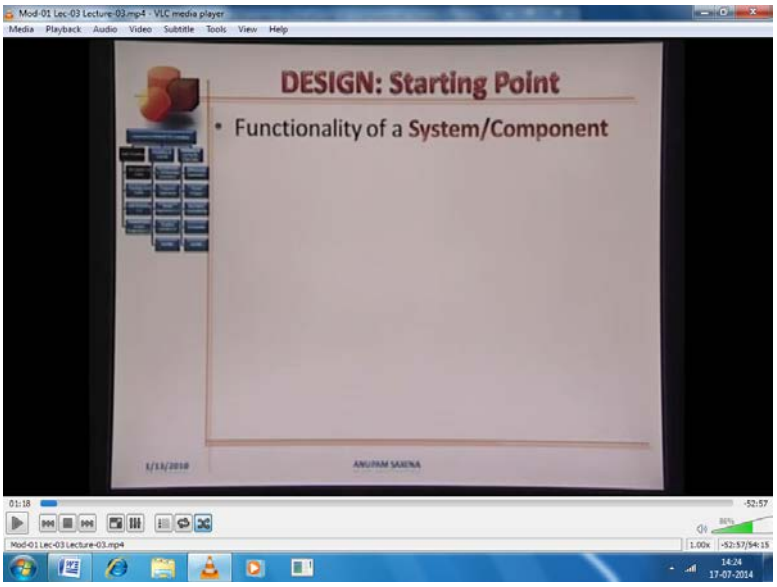

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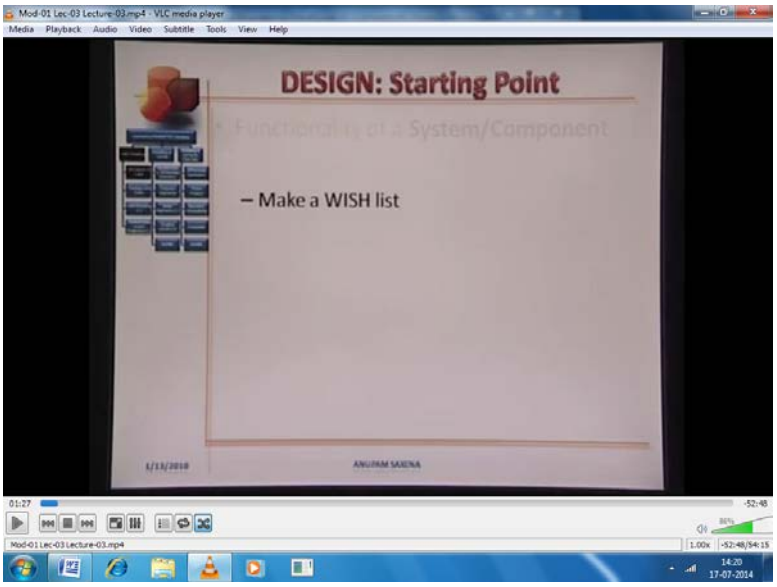

We know from the work shop that form design can be manual or automatic. The manual approach goes with the commercial phases and technique. Everyone has heard the page back to the drawing form one require ((02:22)) notion or idea has to how the product should look like. The manual approach involves creativity his and experience of a design, it however does not give a three dimensional invented of a form. In the automated method one may not have much idea but, a rough notion upon how a product should look like. One can only identify component and into relation, why I have said the basic rule. When these basic rules our computer and then propose a candidate design

analyse it de-mollify it to make it better than previous one, an example here would be the linkage generation near the end of lecture 1.

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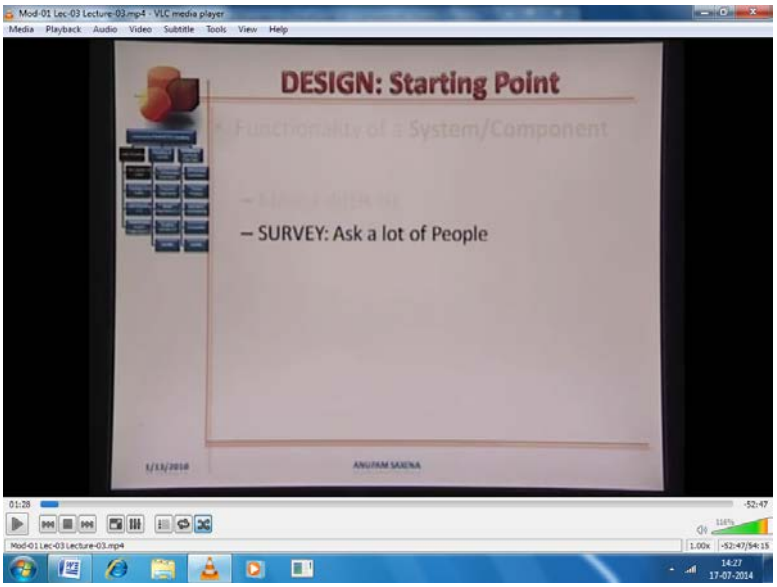

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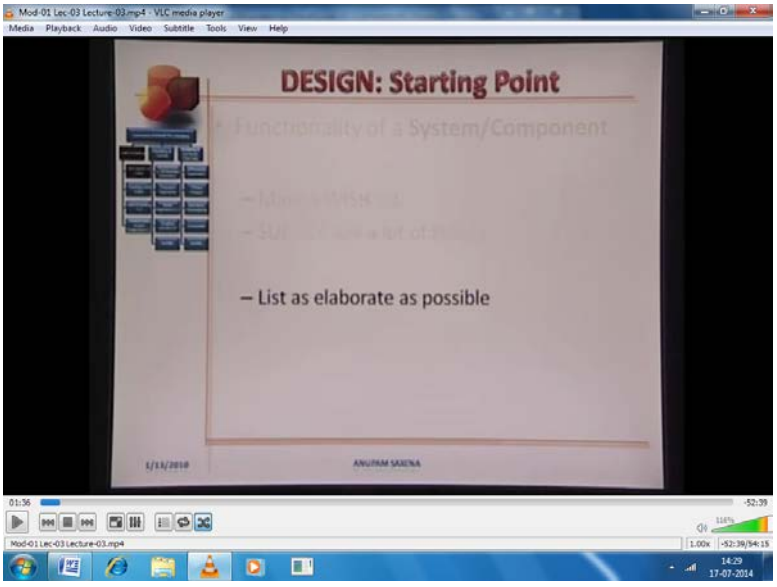

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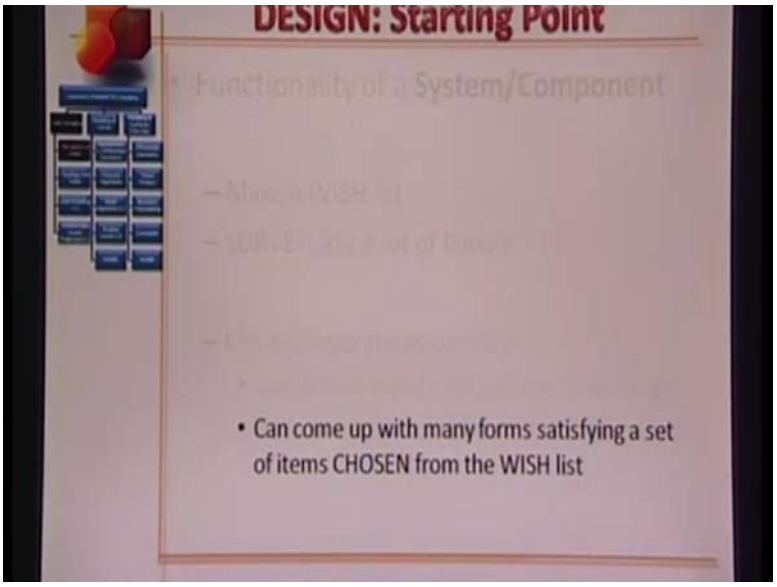

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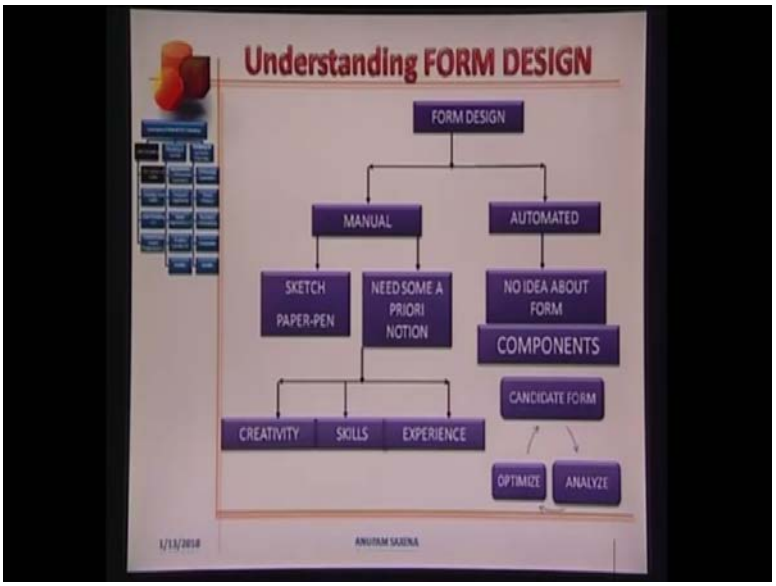

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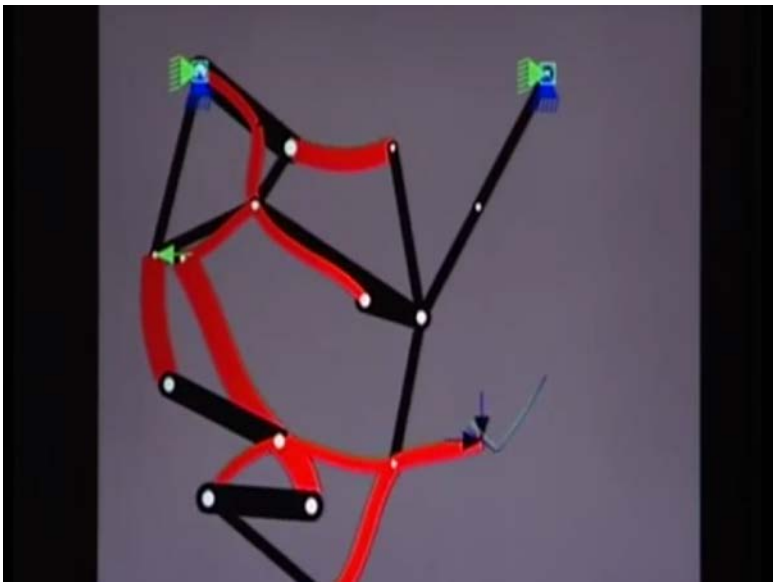

Personally this is how I differentiate between the conventional paper pen approach and the automated solid modelling or form designing approach.

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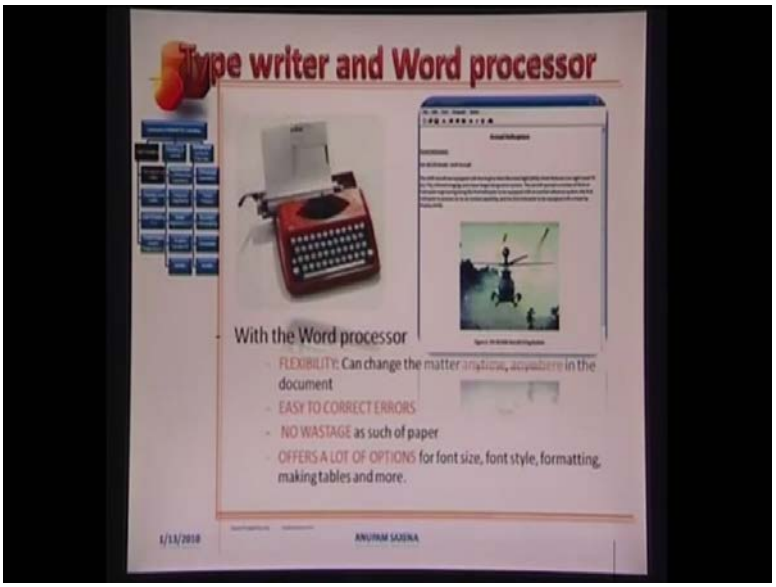

The first one for the paper pen approach is like type writer. While the second one for the character approach is like a word processor.

With the Word processor we have a lot of flexibility you can change the matter anytime anywhere in the document. It is very easy for us to correct errors. We do not see any wastage such as bags and papers. About processor offers lots of option for font size, font

style, formatting making tables, getting pictures and lots more. In case of a typewriter one is to be skipped. The matter gets printed as of types in case more than few mistakes. The paper gets wasted there are not many options with regards of a matter knows the typing were special may have their own advantage, behave expression may still be at its best, for someone who prefers conventional effort; off course one can print the document and that automated form design can be accomplished in better if we assume the designs are very well.

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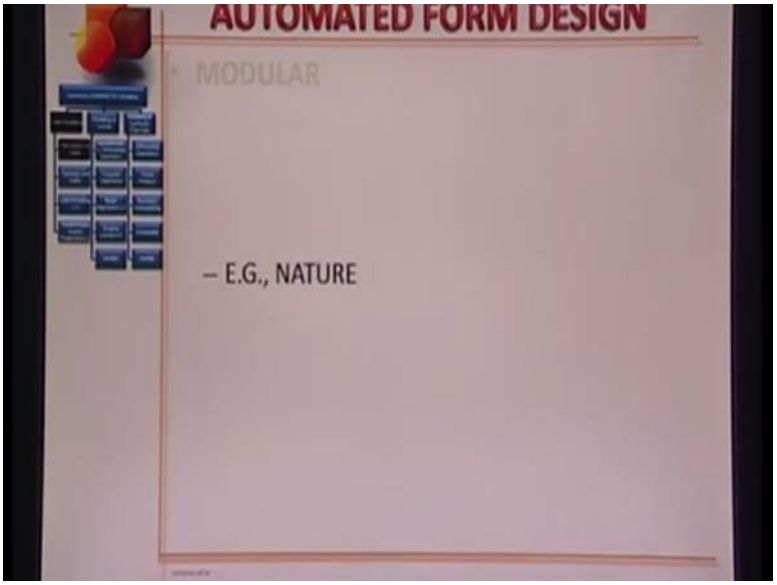

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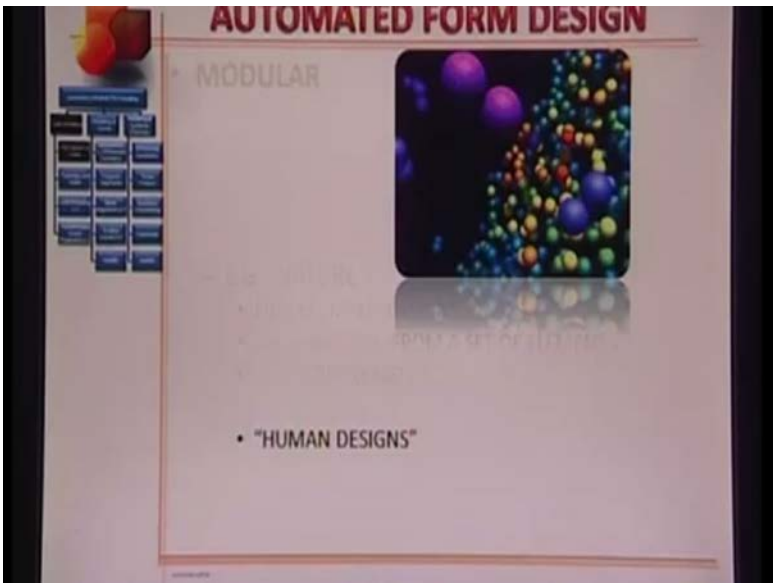

For examples those of nature, they are finitely made designs are there all are composed are meant 120 odd element present on the earth. Human designs can modular through compromising of much less components but, how perceive solids.

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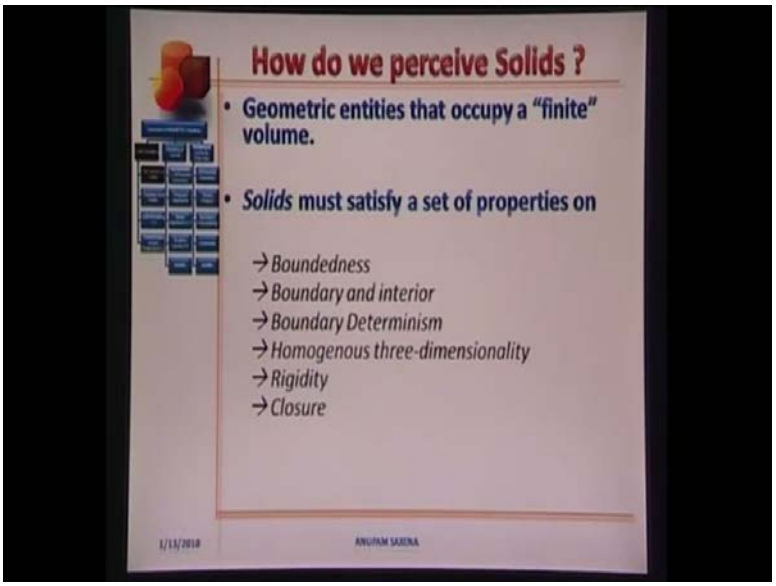

Solids are like geometric entities that occupy a finite volume and space. Solids must satisfy a set of properties on boundedness, On Boundary and interiors, On Boundary Determinism, Homogenous three-dimensionality, Rigidity, Closure.

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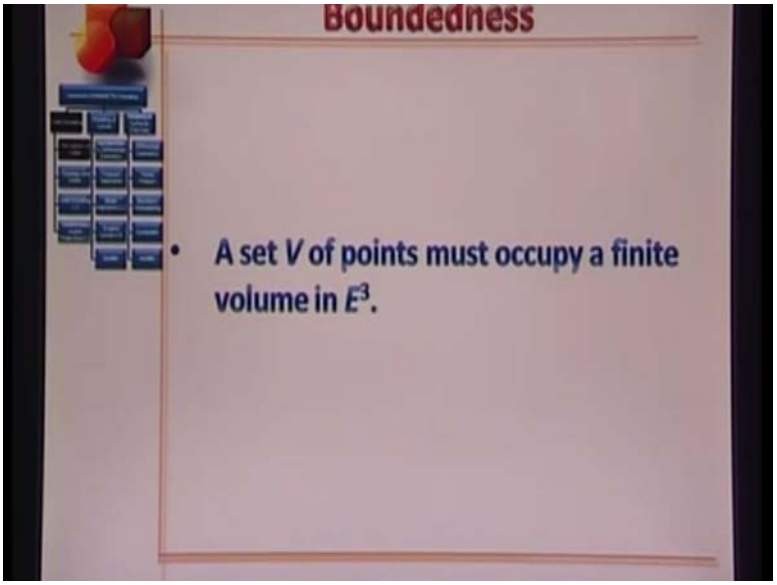

Let us, explore these properties in detailed boundedness a set V of points must occupy a finite volume in eugins space.

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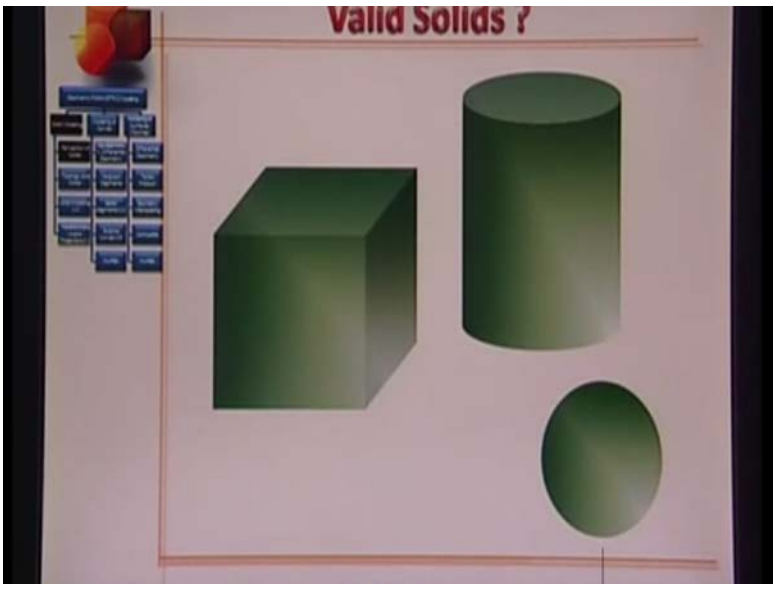

These slide shows the solids are they valid? Yes. As they occupy a finite volume in space.

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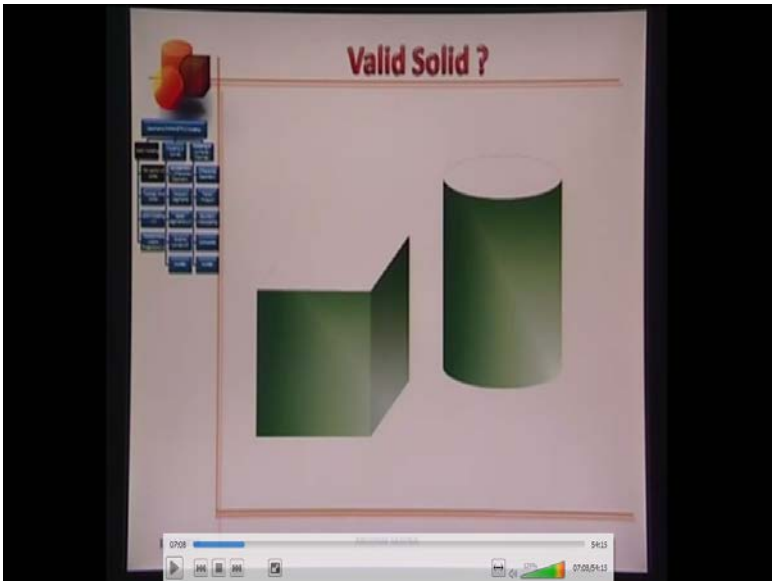

Lets us, now take away the top space of the block and the top space of the cylinder are these now valid solids? No, because their respective volumes are not bounded in it. Let's

now try to understand the 2 terms boundary and interiors for a solid. Let B, V and I, V be two subsets of V such that the union of B V and I V is equals v, v is a set of all points that defines solid. B V is a set that compromises are boundary points. I V is the set of all interior points a point p belong to V is an interior point that is p belong I, V if there exists an open ball enclosing p consisting of points in V only.

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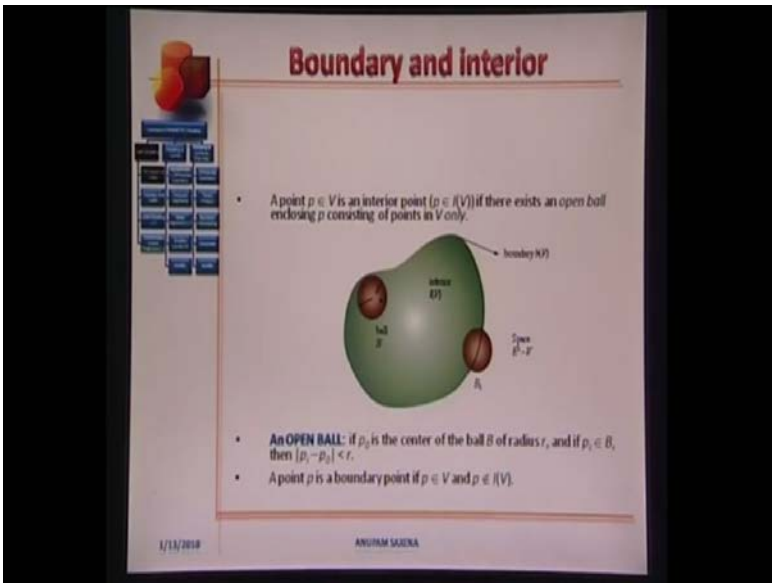

Let see, into solid form I V is set of all interior points, B V is the boundary of the solid and the external space is the interior space, minus set of all points find in this solid. This is ball B enclosing the point V and ball enclosing the radius r this is ball B 1 as the boundary of space. Definition of an open ball, if p sub 0 is the centre of the ball B and the ball is of radius r and if p sub I is the point that belongs the ball B, then the distance between p I and the centre of the ball should be splitly smaller than the ball radius.

An open ball can be considered to be sphere without the surface. How do you take care is that point p belongs to the interior of a solid. If it enclosed by an open ball of any nonzero radius are such that the ball itself encloses, the entire interior points of the solids. Take the ball B 1 for example, which encloses a boundary line no matter where you place the ball to enclose a boundary point, it will always include some points of the external space, which is the opinion space minus p a point p is a boundary point, If p belongs to V and p does not belongs to I V.

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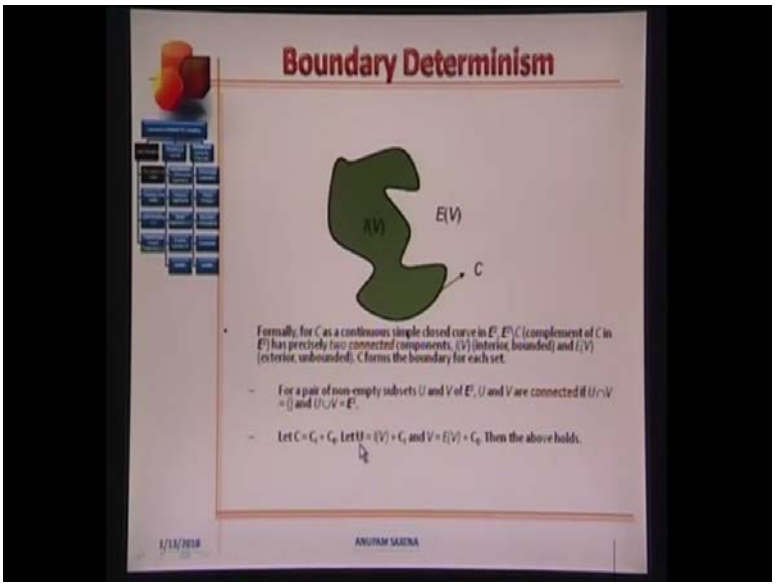

Boundary Determinism, Jordan's theorem for a two dimensional Euclidean plane E2, this is the fundamental theorem that lays down the bases for solid modular. A simple nonintersecting closed which is also called the Jordon divides E2 into regions interior and exterior to the curve.

Take this picture prints C is the simple flows non self intersecting curve. C is dividing a set of all points on this plane into 2 subsets. 1 is I V which is interior to the curve and the second is E V is exterior to the curve. Formally for C as a continuous simple closed curve in E 2 complemented C in E 2 has precisely 2 connected components. I V which is the interior set and bounded and E V which is the exterior set and is unbounded, where C forms the boundary for each set for pair of non-empty subset U and V of the plane. U and V are connected if the inspection between the two subsets is a null set and the union of the two subsets is the entire plane itself.

Let's, divide a set of all points on C into two subsets C I and C E, I here response to interior and E here, response to the exterior. Let us define the two subsets U and V as U equals I V plus C I and V equals E V plus C E clearly then we can see that intersection between 2 subsets is a null set because there is no common point between the 2 subsets I V and E V and also no point is common between the 2 subsets C I and C E on the other hand, if we consider the union between the two subsets. It is the interpatation itself

because what it is saying is locating the union of set of points in I V the set of all point in E V and also the set of all points on this curve.

Boundary determinism again, this is the extended Jordan's theorem. If equivalently in the Euclidean space a simple and orient able closed surface B V divides a solid V into the interior which is I V and the exterior which is E V spaces. U will come what are orient able surfaces if the closed surface B V of a solid V is known the interior I V of a solid V is unambiguously determined.

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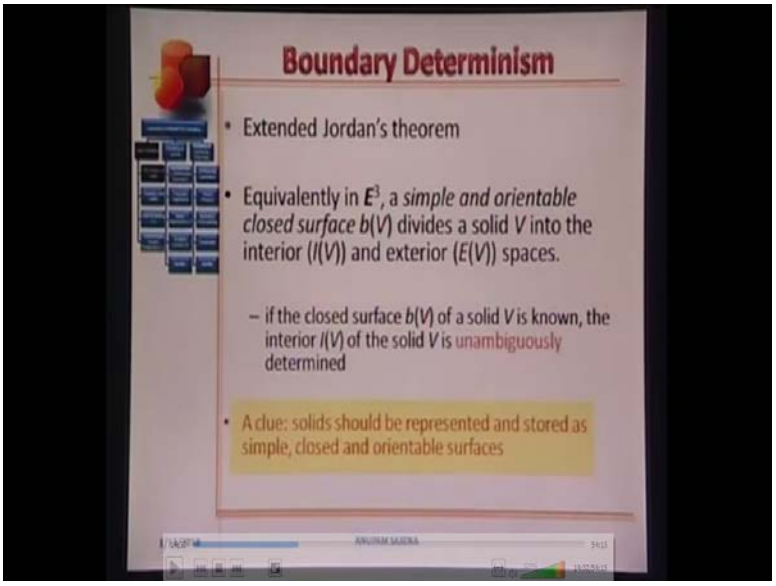

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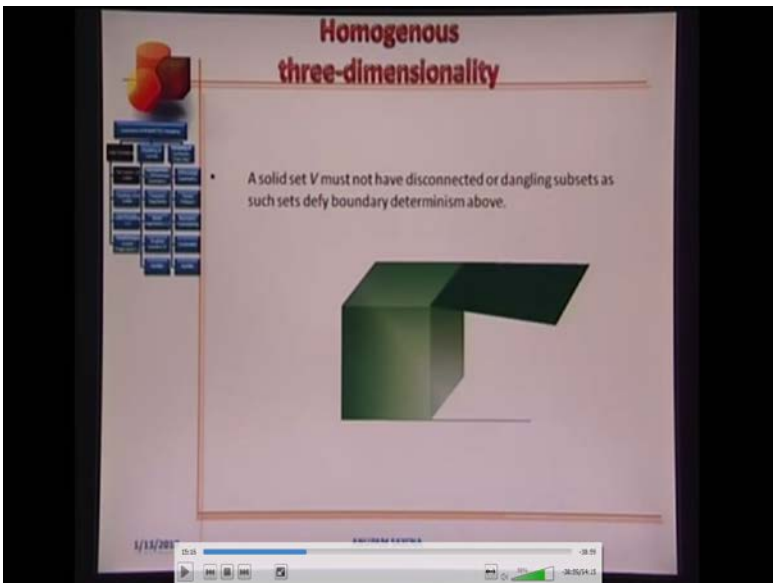

This gives up a nice clue, that solids should be represented and stored as simple closed and orient able surfaces, as supposed to set all points which are confined in space. For example, the sphere if a spherical surface is known so will be the sphere. Homogeneous three dimensionality of solid set V must not have disconnected or dangling subsets as such sets defy boundary determinism above. Take look as this example of block, we have dangling surface and also we have dangling line. Question is this a valid solid? No. Loosely the block with connections B the plane has dimensionality 2 and the line is 1 dimension of solids needs to be homogenous three dimensionally, Rigidity.

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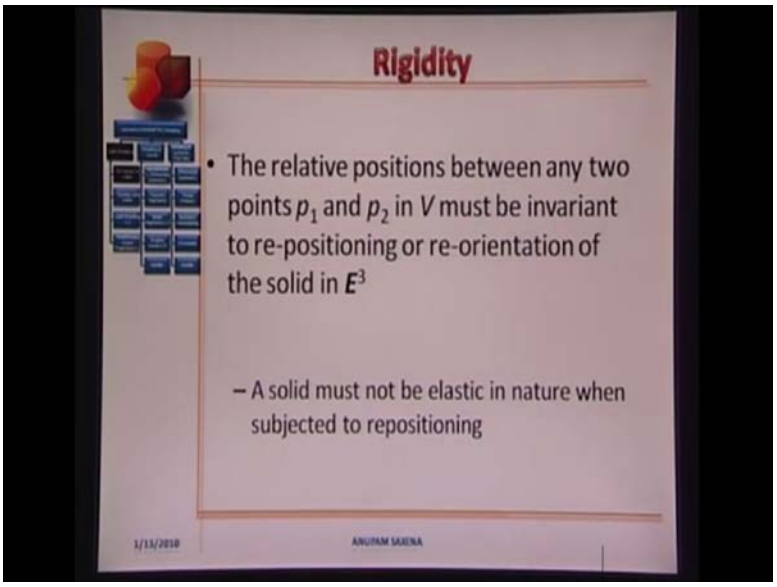

The relative positions between any 2 points p 1 and p 2 in V must be invariant to re-positioning or re-orientation of the solid in Euclidean space. What do you want to take care is that a solid may not be a lasted nature when subjected to rigid body reposition. Take a look at this example. This is the initial position of the solid which undergoes rigid body transmission and a change fine position. A defining body under any rigid body transmission like translation, location or the combination is not allowed.

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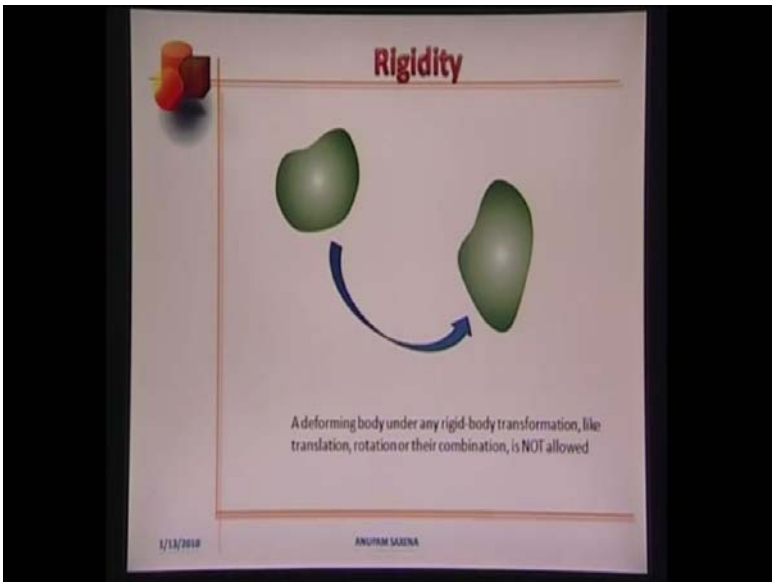

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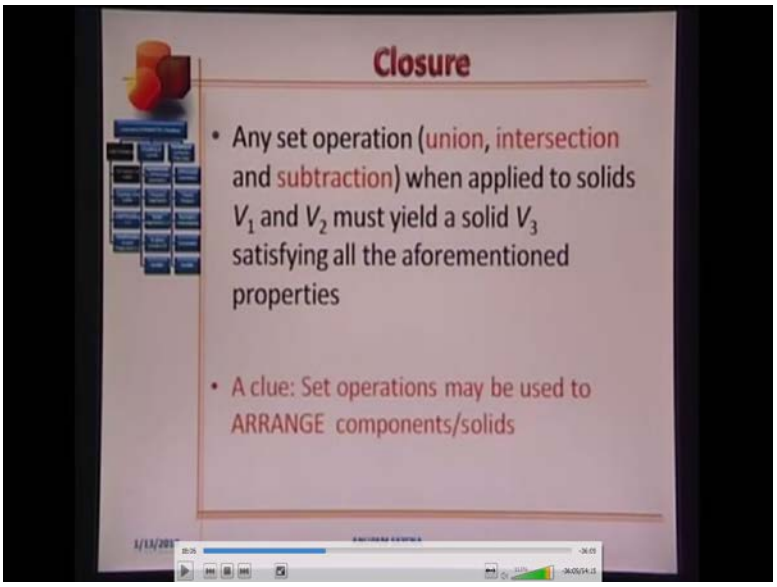

Closure any set operation which is union, intersection or subtraction when applied to solids V 1 and V 2 must yield a solid V 3 that satisfy all the above previous properties. Consider this solid as V 1 and this solid as V 2, the valid positions between these solids can be any. Solid V 2 can set over solid V 1 we can get inside anywhere, what I am saying, here is this would be a bounded set of points and this could be again a bounded set of points. If I want to manipulate the positions and combines these 2 solids in anyway be the union, be the intersection, and be their addition or subtraction. The resultant set should be bounded and that would be valid solid again. For example, if I add the points

in solid V 1 in those in solid V 2 I get a new set V 3 which is equal to V 1 plus V 2. The set of points V 3 should satisfying all the previous properties, we have discussed on solids, this gives us a vital tool set operations may be used to arrange components or solids.

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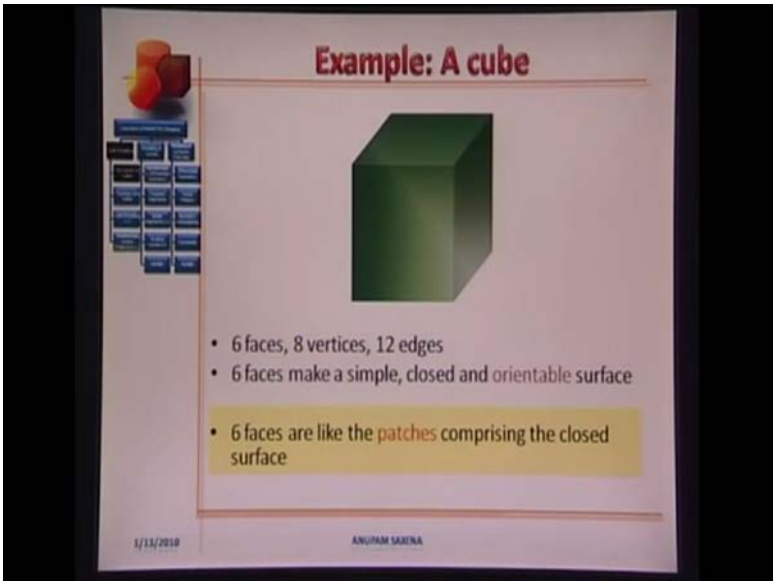

Let us consider a few examples; the first 1 is back of the cube. The cube has 6 faces, 8 vertices and 12 edges 6 faces make a simple, closed and orient able surface, we try to figure what orient able surfaces are later. 6 faces are like patches comprising the closed surface.

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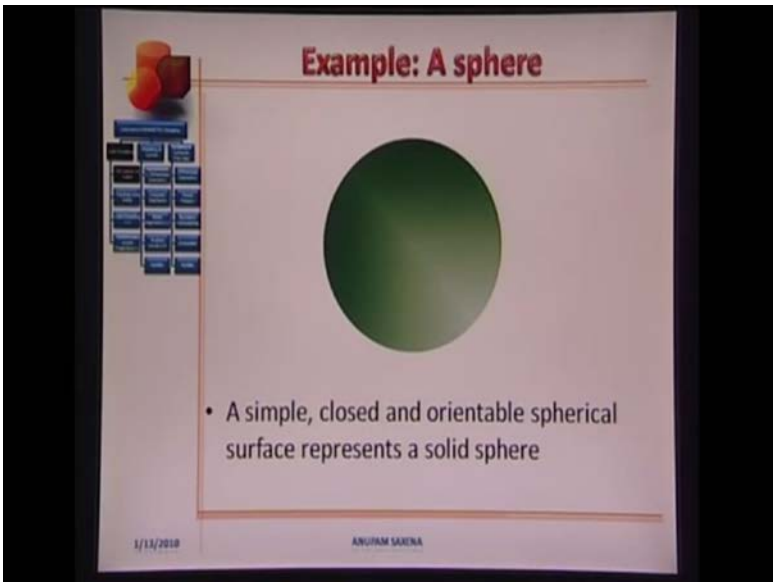

The second example, a sphere simple closed and orient able spherical surface represents a solid sphere.

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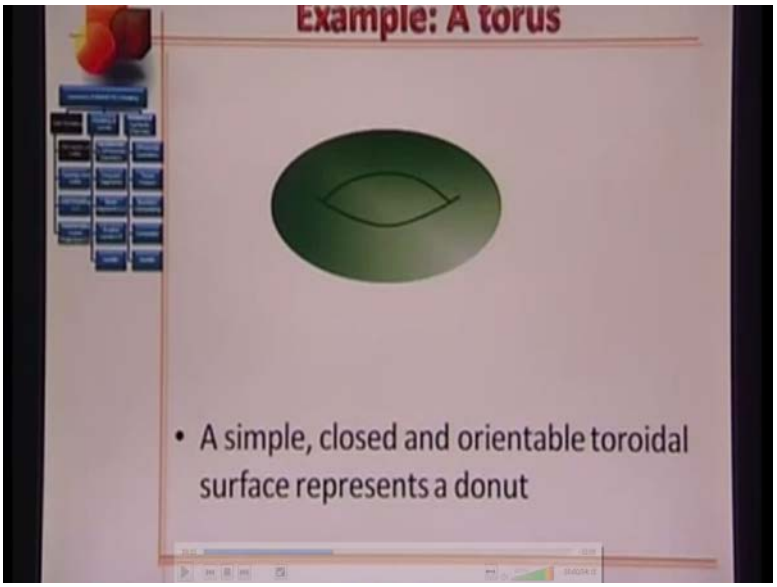

The third example, a torus again a simple closed and orient able toroidal surface represents a donut.

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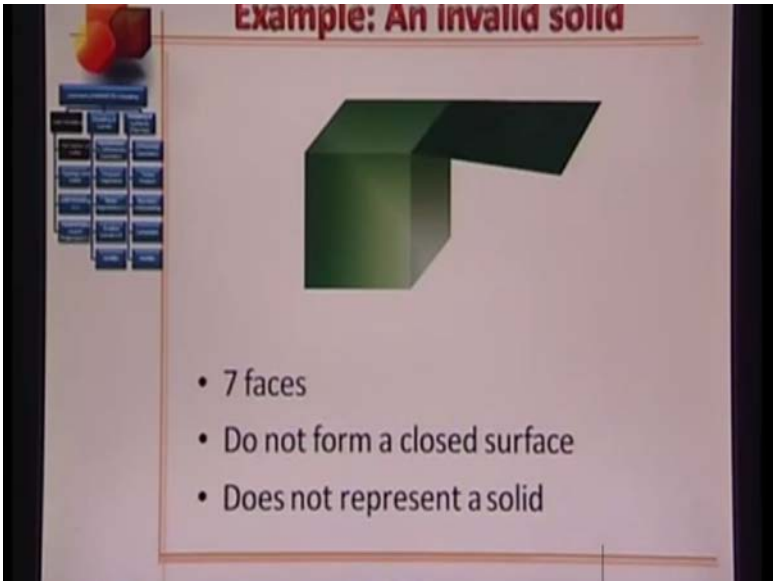

This is an example of an invalid solid, It has 7 faces, 6 4th the cube and 1 dangling. It does not form a closed surface, it defies marginal functionality and therefore, it does not represent a valid solid.

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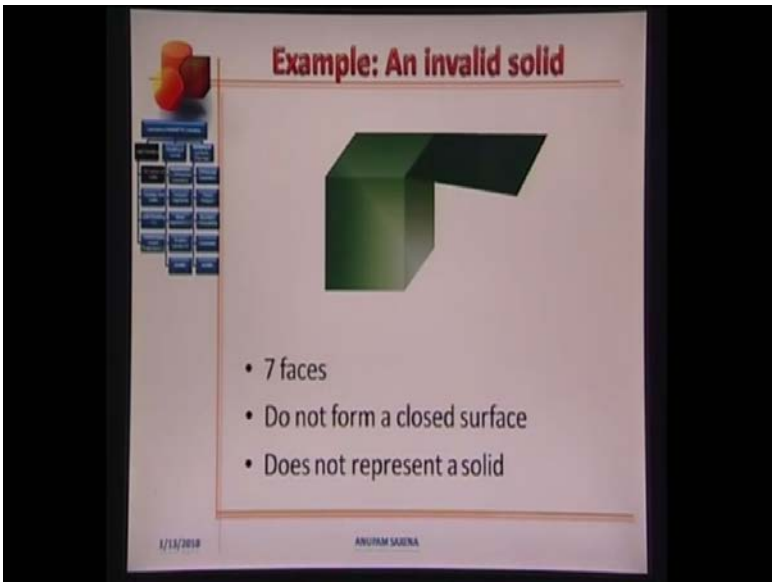

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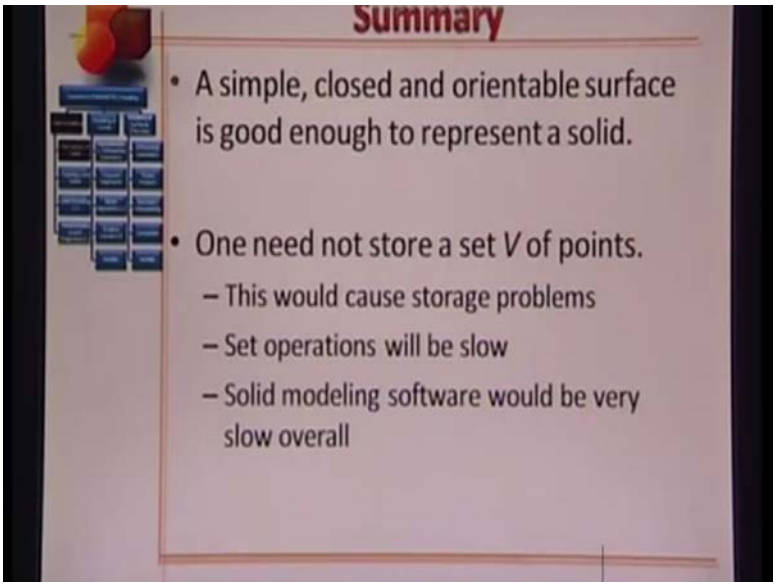

In summary, a simple, closed and orient able surface is good enough to represent a solid. One need not store a set V of points because, there will be infinitely many and they would cause storage problems. The set operations to design new solid will be slow and solid modelling software would be very slow overall.

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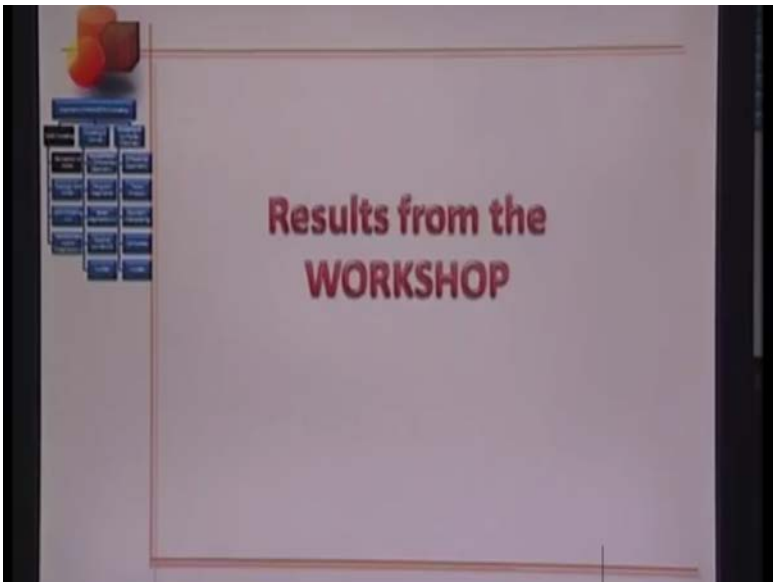

Now, let us take a look at the result from the design workshop that the student did in lecture 2. So, this is the first design, what we do is we are going to be looking at all the designs, that the students have come up with and we are going to be evaluating those designs, as well as describing, how the functionalities that you have initially chosen are all in cooperated in your design. So, let us do that. Group 1 this is the first design of group 1, design 1 this is the first form I agreed of the first group different views.

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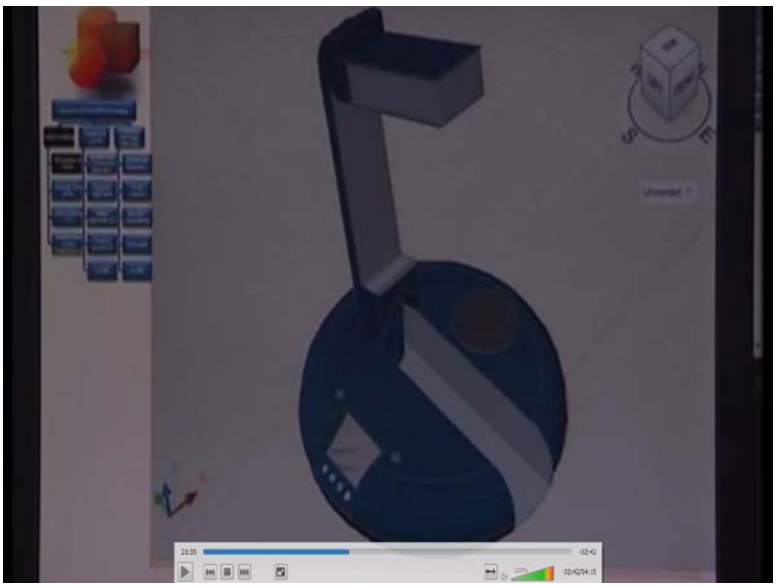

So, let us go back and this seems the best view that can help you describe all the functionalities, so, can anyone of you come up over here and describe the functionalities. Or describe the function that was there.

So, this is the table lamp this lamb is the flex facility and this can be folded into this place and this will make this whole thing compare and there other functionality are also added in this triple lamb. There is one display and there we can see the timings and we can also Inco-operate their remainder and global times. All those facilities we have chosen earlier and there in the front panel also. We can see some switches that will help us for doing all these things and there are 2 also 2 holes. As we can see in the top and these 2 are for pen stand and at the rare side of this table lamp, there is 1 speaker, that we are going to use for the FM that we are in cooperated in our design and at the back side there in the base there is the battery for backup and there we also in co-operated that for the charger facility.

Is it a battery based or you have also had an electric gate. Both, sir did u also have a mobile charger on it or may be not? Yes sir, that is on the back side every sir electrical panel and all this connections are going to be at the back side the rare side

Yes sir.

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Let us see, this is the back side that we have? No sir that is at the right means that of this.

Yes alright, thank you. Enough for you to evaluated this design. So, remember the students are still competing with their designs. So, each student group is going to be evaluating all the other designs, the designs that they have not made any body want to describe this second design which will show now. So, they had come up with second form. So, let us take a look at all the views.

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Sir, as we consider these are the speakers this thing is the L C D display, in which we can see the global times and it will also act as the reminder. This lamp shape contains the C F L tube and also the night lamp and these are the various buttons we can see to operate the lamp and on the back side or on the rare side, we have the mobile charge and inside the lamp.

Can you see that?

No sir, that views not.

Let us see here may be?

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This is the front view and sir rear view as not been shown.

But, that includes the mobile charge point and inside the body of the lamp we have the battery which will act as an emergency backup

Have done it?

Yes sir.

Alright, so you have everything for design 1. Once you go ahead and report your marks for the first 2 designs you can take your seats. Any reason why you went directly for solid modelling as are suppose to designing or getting your forms using paper kind approach.

Sir, initially we have made sketches but, we are not able to show all the functionality in it. That is why we directly went for solid modelling.

So, it gave you to be brought time to be able to think and design the table lamps.

Yes.

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Yes, are you guys done group 2 they could come up it only 1 design. This the first view of the design, the second view, the third view, completely folded and resting over the table I belief, fourth view, which view could you want to chose to describe the design. Would you like to stab on the function? Would you like to acknowledge any help that you have taken from anybody when designing this.

Yes, I have taken help to make design software by M tech student, second year.

What is his name?

Atulf Sultani

Yes, here we have used this lamp, which is very stylish, which our first criterion was and here, we have mentioning you the calculator part.

You can take some time to find them out ((26:30)) and corresponding at different function.

Yeah

Here, we mention the calculator, which can give us time and alarm also and F M part is also there, which we can control by these keys and this is also foldable and if you will see that another view of this, then we can ensure that.

Let us see.

Yes, yeah

This view then here this is the glass on the light then it can we worked as a light lamp and there is this is.

Ok

And here this pencil and pen stand, which we have mentioned an in back of the stand, we can use it as mobile charger also.

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At the back let us try to find out in the view out; I think it is not we have also given the chargeable battery here. So, that we can use in the case of power and

Do you think this design yours is going to be stable? Because your base is seems to be a little smaller.

Yes sir, it is stable.

It is not going to be top-up has gone top-up has gone be has gone be resting on the table top-up.

Yes sir, definitely.

Because we are using here, LED bulbs

LED bubs for what?

Sir for our lightning would you like to, sir for the compact purpose of the lamp we have used here L E D bulbs so, that the size of the lamp can be compacted

And the cost of the chargeable battery at the down, the centre of gravity going to shift downwards that is why it is not going outside.

Which is heavy?

The battery is heavy.

Alright, so this is what we have from group 2, take a while and Jordan your evaluation of this design.

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If the lamp is going to working it is going to be seen like this. May be you have this nice light on the table downwards could you get the effect in the solid modelling software.

Yes sir,

How it works?

Yes sir.

Software has you done

Yes.

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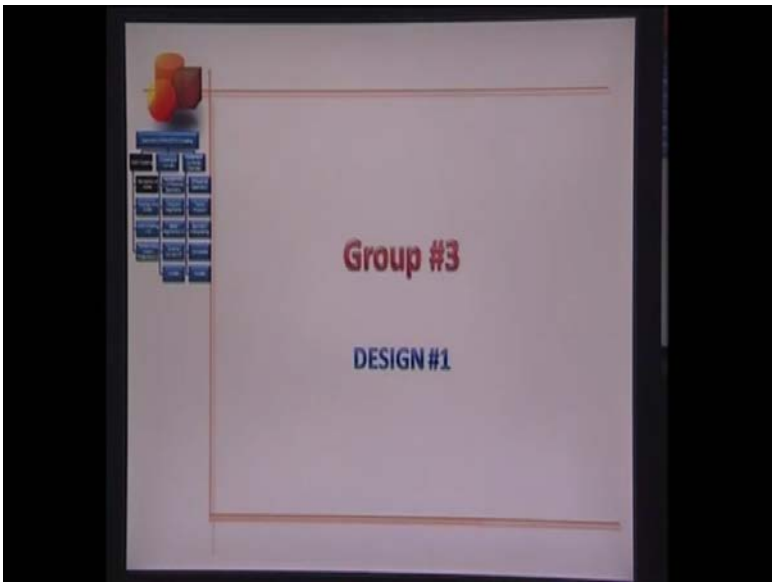

We now, see about group 3 has for us would anybody want the first design .So, this is the design from group three. Let me show different views first. Let me show different views. Which view would you like to choose to describe your functions?

Sir, other one

This one,

This one yes sir, this is the very simple form of the study lamp and here actually at the bottom, we can see there is an aquarium and this is the flower pot and we can use for decoration of the room and also here, we can see that this is calculator and this is the simply, study lamp and inside we can used bulb and there is admit of only bulb and this is back side here and there is admit of battery also but, we cannot use this battery arrangement for aquarium for their is only arrangement of electricity supply and battery is used for only light supply to this, that is it sir.

Anything else

No sir.

You going to add

No sir, that is it, this is the very simple form of study lamp.

Any reason why you did not go for paper pen approach?

Sir, actually this is the very simple form and paper work, we will take only lot of time and we can simply draw it on the by solid modelling, that is why we did not go for the paper work.

Any particular reason you chose this particular texture after design?

Sir because, all the purposes are going to complete because we are using calculations

The texture by texture, I mean those little tiles, like things rock like things.

Sir, just to show this is aquarium I use to show this, just to differentiate from this base

Ok.

I choose that.

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It is going to be a glass. Ok.

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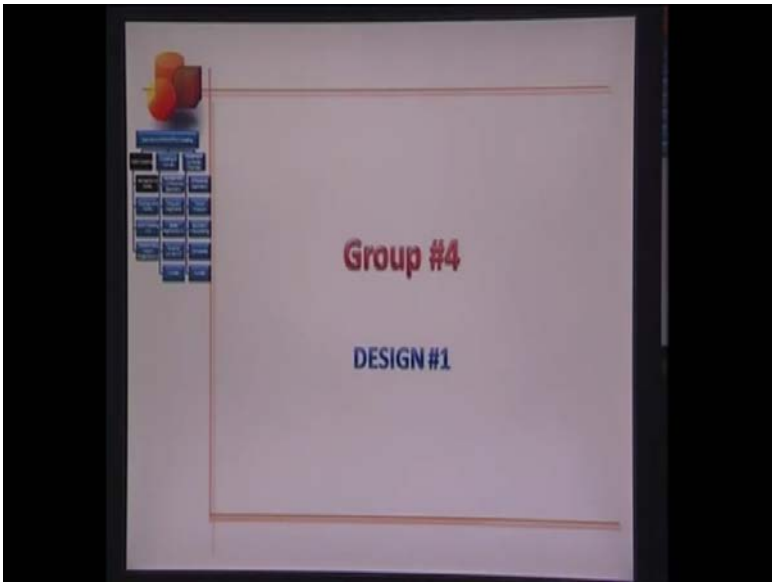

This is what would 3 for us you can go ahead and evaluate the design finally, group 4 they have 2 design for us. Let us take a look at them first or meantime all the member of group 4 can take a chair over there. Ok this is first design, from group 4. Let me show you different views of this design before of the member from group 4.

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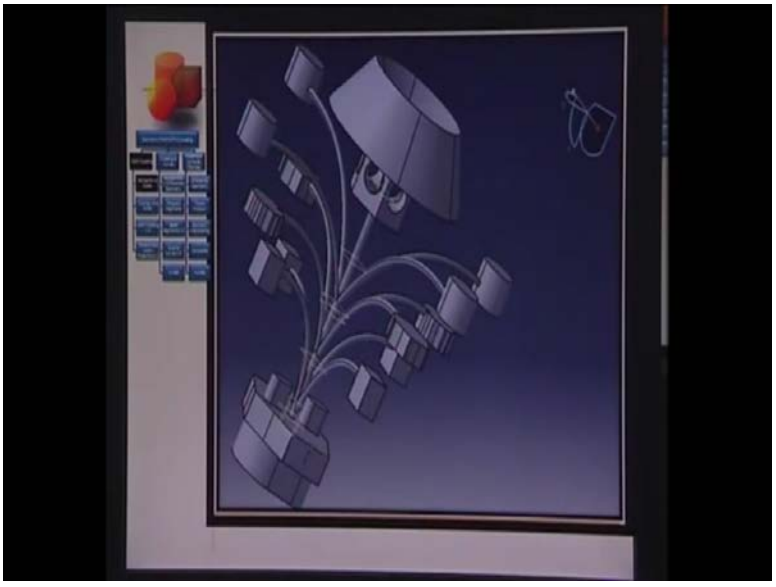

So, which design would u like to choose? Which view would u like to choose to?

First one,

The first one

This one,

Yeah.

This is only in the decoration purpose as well as double length. We use the sound box is there this is the sound box system, this is the 2 point 1 system is there.

What is the 2 point 1 music system?

2 point 1 music system

Yeah.

There is the various type of light is symbol is here, which all the parts can be rotated around and twisting all the parts as we wish is they are many features, establish in this box like long clock, mobile charger. It is not this shown their but, it can be sufficient space their which are been assembled there.

So, all your function is at the base.

Not at the base in the middle part there.

Middle part could be where, can you show that?

Yes this part, this is the 2 chair and this is the supporting lamp in this part also a bulb is establishing and

So, how much light have you shown?

There is only 1 light which will all the direction it will be shown.

What are the other hanging features?

Yeah are they also lights yeah all parts of these are lights sir.

All these stuffs are rotatable, I mean can we rotate them.

Yeah, yeah it can be twisted ah in many directions and all the system is rotated on this base.

You have cylindrical.

Yeah, cylindrical shapes,

Conical, all the types lights ok.

Any reason why you did not go for a paper pen approach?

Yeah, actual we go for the paper pen approach but, when we are going to the designing so many, description have been found between in between designing this modelling.

This is the little modified version of the what we had in you are initially form design yeah, exercise

Ya

This is the second design, this is the first part and this is the second part.

Ya

So, all of you can come. Which view would you like to choose to describe the design?

First.

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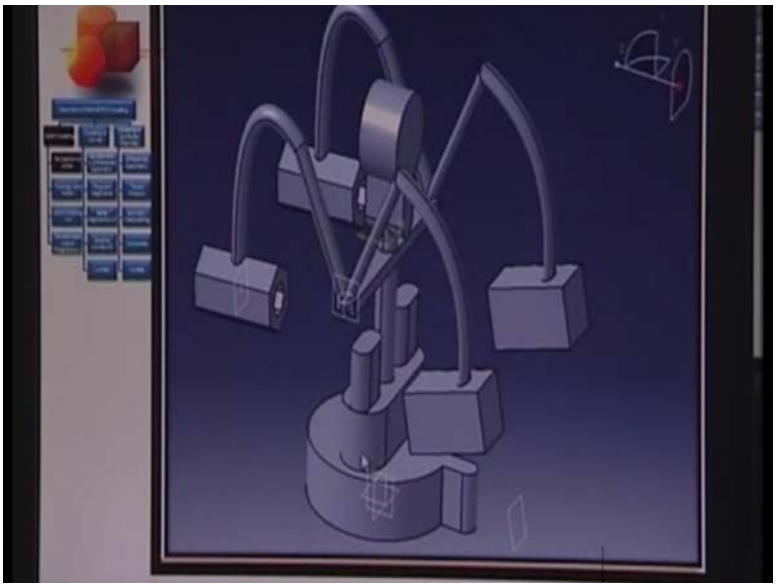

This one actually this is our second design this is also same features as first this is the two speakers and this is the tape-recorder and here it is a switch board for whole all things and here the secondly, we can see this is watch and these all lights we can rotate 360 degrees.

Yes sir, that is it sir.

Pen stands mobile chargers. I had thought you had done

Yes sir, yes sir first three can show, yes sir here, we can have the all in this switch boards then ok here, we can have charger board all things

Ok. So, go ahead and evaluate the two designs that they have.

Ok. So, this is the first design from group 1, group 2 how would you evaluate this design? Sir for this they have given 8 marks

8 marks group 3

Sir 9

These are out of 10 marks, group 4

7.5, 8, 7.5

This is the second form group 1, group 4 how do you evaluate this?

8.5 Sir

8.5

9 marks

9

Group 2, 6.5

6.5,

8 and 9 and 7.5 is 24.5, 6.5 and 9 is 15 point 5, 15.5 and 8.5 is?

24 sir, this is 15 and 9 is 24

This is the design from group 2, group 1 and how do u evaluate the marks?

Sir 6.5,

6.5, group 3.

Sir, 10 marks

Group 4

8.5, 0.8, this was how much 25 this is from group 3 group 4 how would you evaluate this?

9 Group 4 goes for 9 groups 2

6.5,

Group 2 goes for 6.5 groups 1,

Sir, 7.0,

7, 9 and 7, 16, 22.5

This is the first form from group 2. Group 1 how will you evaluate this design?

Sir, we had given 6.6

Group 2, 6 marks 6 Group 3,

9

This is the second of the 2 design group 3.What do u say about this?

9 marks group 2 sir, 6.5,

6.5

Group 1,

7.0, 12 and 9, is 21 and 7 is 16, 22.5.

So, remember initially we had started this entire workshop in the cooperative competitive method so, the groups 2 in a single group cooperated together to come up with various forms of table lamp and some of you guys completed and evaluated all the designs, that which has saw based on this we have final values looks, like this 1 and the design from group 1. The first design from group 1 this is finalised by 0.5 marks and the third design is again from group 1. So, this is number 1 this is number 2 so, this design from group 2 has topped the list so, what did you like about this design in particularly about this?

Sir, basically we evaluated every design based on 3 criteria functionality, style and compact so, this design scores mainly in style and functionality.

Good

Group 3, what did u like about this? Basically, sir this design is very compact and also stylish specifying we can anywhere; it is very compact actually it is very stylish also, we can use it anywhere.

Not only for the purpose of study lamp,

Yes sir, night lamp also we can use it anywhere. Group 4 this is a stylish not so much for personality but, it is so stylish so, we gave the marks ok.

This is the first design from group 1 that came 2. What did u like about this in particular?

Sir, it contains many features and it can be folded also, we gave them marks.

What did you not like about this design?

Sir, not so much stylish. So, it lost in style.

Yes sir,

I would like to say that if I am a consumer because of the foldable because it is foldable and lots of features this is the main criteria of all design also.

Group 3 why liked and why disliked?

The main thing is sliding feature it is having the most attractive things in this, it is differentiating from other one the main thing the sliding and also it is having lot of features in this that is why I liked this in this.

Group 4 why liked and why disliked?

Actually, it has more functionalities, we can foldable that is the main criteria movable and with this slide we can design whole do you want to suggest?

Any modification to this? Yes, if base should be in the should be some different criteria also any modification.

Ya should be, sub co should be their sub co should be their yeah.

Any modification that you would want to suggest

Sir, the base can be very compact, we can use as a more compact we can made it more compact the base.

You can make it more compact,

Yes, sir and also this design holding the bulb, we can use it also very small we can also use it also very compact design also.

Any modification that would you suggests.

No sir it's ok. Sir it lags more than styling and compactness.

Its lags style little bit and compactness a little bit.

This is the design from group 3 members of group one. What you think is missing here? Sir, basically it is very large design, table lamp such that it should occupy less space on table, which is why we did not approve of this design so much.

Group 2, what do you have to of this design?

Sir, same thing it is not a compact design and

It is bulky and what I think is, if we use this lamp in your table, then it goanna occupy more space so, you need a bigger table to accommodate this thing.

Group 4, what do you have to say about this? It is very good design in think it is the some different design as we have seen it is a different design. Do you still suggest any modification?

No it is very good.

It is very good

I can suggest but, it is compact it is actually we are designing table lamp know sir but, it is somewhat bulky if it is compact it is so, better you would want to go for compactness.

Yes, group 2, any modification that you want to suggest about this

Same thing compactness

Ok Group 1,

Sir, any more about compact or something else

Sir it needs to be very smaller and aquarium really is not required for a table lamp.

Just its different idea, that is what its new one but, it still occupies maybe may not be that new but, it's still occupies the lot of space.

May be the whole base can be used as the table for this lamp, then the aquarium may be the stand of this table and then if the light goes on the table then it will look better.

So, you want the entire table base to be required.

Yes sir

Good.

This is the first design of group 4 any modification, that you are going to suggest.

Sir, again it is a very large design there are number of lamps, which are not really required, the design is really good this and this on this style, front it is good but, functionality way it is not up to the mark.

Group 2

The same thing the functionality is not so much ender lights there are some many lights and I think there is no utilization of that and bulkiness is also a criteria that there is no compactness in the designers very much complicated,

I think it is not fitted for all the cables.

So, you think it is not more of a table lamp; it is not that much of a table lamp but, more of a lamp.

Yes, Yes of a side lamp. Yes,

Group 3,

Sir, it look good but, its somewhat it can occupy larger space does not it could be somewhat compact sir it is very bulk actually it is very stylish but, from the point of functionality it is not that much good but, off course it is unique in its own style.

Unique in its own style ok.

Do u say something thing about this design are the same thing,

Same thing sir

How about you? Same thing, sir same thing, sir

Bulky more of side lamp as push to a table lamp.

Yes sir, yes again number of the lights that have been provide they are really need not required because, table lamp should be such that they should be focused on one particular area so, again there is some modifications required in this.

Ok.

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As you know different designers have different views, when it comes to designing different products. Let us see what students learnt from this entire workshop. Group one what did you learn from this workshop?

Sir, basically we learnt how to make aesthetics with functionality that is the main thing we have learnt.

Sir, we had just learnt how to go through all the procedures means, how we can design a form but, we have designed and made and that function is how to incorporative in the design that we have learnt through a first schedule.

Group 2 what did you have learnt?

Sir, we have learnt that how to design a thing or how to design anything step by step and we have also learnt that this conventional paper approach paper pen approach is far more behind from today's technology and in today's world you can use many scarce software's.

That is off course your opinion right.

Yes,

I am not saying that

Yes or maybe

That is your opinion,

Yes

I would still, if I if am going to design something i would still use paper pen approach

sir but, the basic thing is when you start when you from 0.1 then first we have to follow the paper pen approach itself because, you have to list up all you are functions and what thing you are going to incorporate in them.

So, there you need paper pen approach itself

Sir, I learnt that how to design an object

Product;

How to design a product and also when that different peoples are different mentality and different requirement. According that they have made design so, if we combine all the design and think combined then we will have definitely one of the best designs.

Ok, what did you learn from this workshop?

I have learnt how the pages idea can come in mind for a particular type of product and how, can us corporate into a reality.

What did you learn?

Sir, actually I learnt different mind can learn different designs so; a lot of few uniqueness came into this, so we have designed only from one point of view. So, different views can also come in mind, we do not think about this so, we can design we can combine all this and designs such a good product

Can you think, did you say that you can come up now with all better design for table lamp?

Yes sir, off course how about yes sir.

Group 4, what have you learnt?

Actually I learnt creativity of the single table lamp, we can see the different types of creativities and in the real practice we are going through like this only, I think from brain storming in the step for designing any product, we have to take some step. I learn steps in this workshop.

What did you learn?

I have learnt that how many designers there in a single table lamp and I think different types of ideas should not be there, different types of ideas should not be there.

Different idea should be there.

Yes, because if you think about a table lamp, it will be consider about only a table lamp and if you create something new, it will not be good

Ok something new is something

That could not be suitable; yeah it will not be suitable by most of them.

Not necessarily, I mean it will be it will take time.

Yeah, it will be eventually yeah

May be so, you hold a little pessimist this time that is I mean do not get dishearten with that is would you want to suggest any other design procedure.

Just you can think as I said there is number set of rules in particular in designing anything, would you like to suggest, any other design procedure on this.

This looks good but, instead of having beating with each other we could have worked together and come up with one better design than all of you.

Let us try that some other time but, definitely will try that so, would you like to let go with competitive spirit and cooperative among yourself ok.

Yes,

Sir, may be after that what do you say impose processing, we can compile up and we can make we can go for a better design that is but, competitive spirit I think that is fine

So, you 2 of the competitive spirit

Yes sir,

So, would you like to suggest an, what kind of design process or this is good through.

Sir, I think well to so, these 7 steps that we executed in the workshop are they or would you want to suggest another style.

Sir, I think this is sir but, I would not do combine all this style off group 4 and compactness of group 2 and functionality of good 1 and sir of and I want to combine all this and want to design such a very unique design.

Ok,

Group 4, I think this is t better procedure to follow,

Well this is the only procedure that we are following. I mean you do not know of any other procedure that may be better than this

No sir, but survey before going to the design, we can go to the survey what existing I think better than that the crazy things we can come from this procedure, I think this is the

You like crazy,

Yes.