

Contemporary Architecture and Design
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Lecture - 08
Evolution and Timeline of Modern Architecture and Design

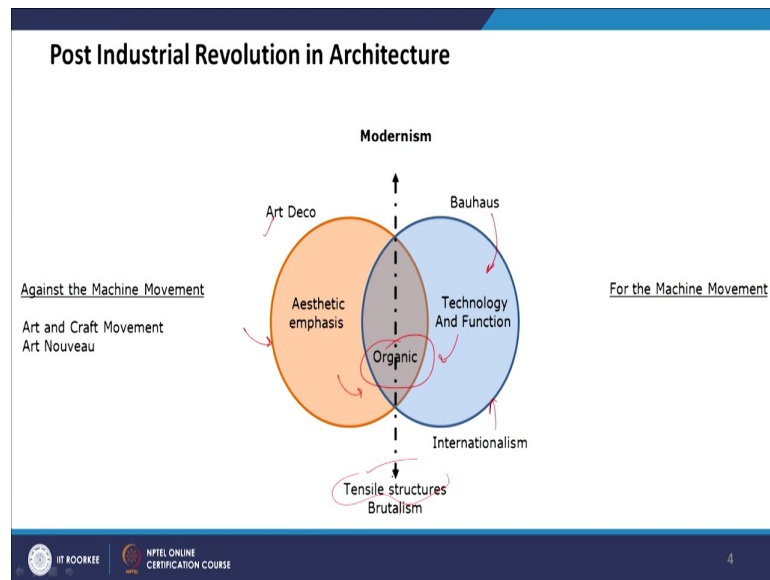
Hello students. Welcome to the NPTEL course Contemporary Architecture and Design. So previously, we till now we have completed, we have discussed about the little bit of history of a architecture and design and then we started with post industrial revolution from where we consider modern architecture and design started.

Just after post industrial revolution there was two different stylistic group of architects, school of thought emerged and who are extremely whose thought process and whose visual expression was absolutely opposite. Which was one was against the machine movement who opposed the machine, made machine aesthetics which is emerged from industrial revolution and another group was for the machine and who embraced the machine aesthetics.

So, after that in 1920s we consider that contemporary architecture, the modernism first phase of contemporary architecture which is modernism started. And then we have the post modernism which is around 1980s. So, today we will discuss about the modernism.

And right now we have talked about two different styles which was there in the Europe basically just after post industrial revolution. And from these two different style how they reacted with each other and then the different phases of modernist movement emerged from these two opposite pole of visual school of thought.

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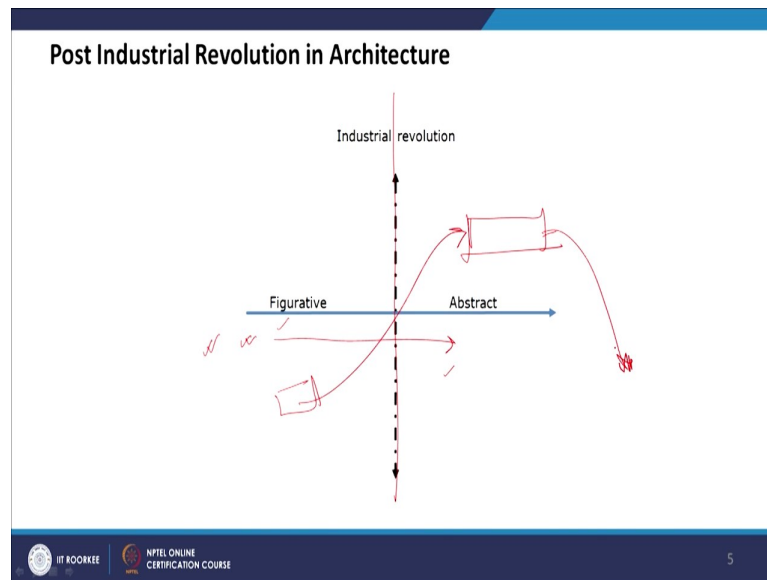


So, we will discuss about the evolution and time line of modern architecture and how it emerged from the two which is one is the for the machine movement which was directly linked with the new technology and new aesthetics which emerged from the new material. For example, steel and glass, and other invention of the new technology; and the other which was in the in the favor of the aesthetic expression which was which was... which got inspiration from the previous architectural and architectural movements as well as the local crafts guild.

And there we have we have art and craft movement and art nouveau. So, from these two how modernism came to a balance from these opposite two side of architectural thought. And there we will have art deco which was more inclined to the aesthetics emphasis, and then we also have above how switch was more supportive towards the technology and a functionalism and we have organic where it was both... the blend of both.

And then again internationalism which was moved towards the abstract geometric form of a technology and functionalism, and then we have the other brutalism, tensile structures and other things were there. So, modernism's journey together we will see how it was and...

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So, if we look at modernism one thing was very common in modernism that after industrial revolution if we see the figurative expressions were gradually becoming more abstract. So, though it might be more aesthetic or minimal, so whether they are going for a minimal expression or they were looking at lot of aesthetic elements in that design, but still the designs becoming more abstract. For example, the Baroque and Rococo, from Baroque and Rococo if you look at art nouveau and art and craft movement was to some extent more abstract and some geometric elements were there even if you look at Gustav Klimt and then Carlo Bugatti's work and then if you look at whiplash patterns also this was little bit more geometrified and not exactly a figurative depiction.

Now, if we look at art deco which is a pure modernist expression, art deco was much more geometric. And then the other expressions, other visual isms of architecture and design was more and more abstract. And to... and holistically if we look at modernism was moved towards the minimalist internationalist style. And So, from the more aesthetic elements to modernism goes to minimalist style. But, now in the high modern specially we will see a very abstract form very minimal color and geometric elements were there used in the modernism.

Now, in the post modern if we... when we discuss post modern then we will see and again lot of expression lot of aesthetic elements were added into the post modernism. So, holistically this is how the modernism is and today we will discuss the overall time frame

and how modern movements were phased into different, there are different phases of modernism and we will get a holistic approach of modernist. And today we will more discuss about the architecture and later when we discuss different isms then we will have more examples of design and other fields.

So, if we look at modernist, one of the main key features of modernisms. So, modernism went beyond the architecture.

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Modernism

- ✓ Going beyond architecture: Asymmetry in building
- ✓ Breaking the nature into simplistic patterns and forms (abstraction): Organic architecture; abstract art
- ✓ Purity in design: Purity of material (Brutalism); purity of Form (basic geometry); purity of colour (white architecture; primary colours in fine-arts)
- ✓ New Materials: steel, glass, concrete

The slide includes two hand-drawn diagrams in red ink. The top diagram shows a rectangular structure with internal lines and arrows, possibly representing a building plan or a structural analysis. The bottom diagram shows a simple geometric shape, possibly a triangle or a stylized letter 'A', with a vertical line extending from its base.

At the bottom of the slide, there are logos for IIT ROORKEE and NPTEL ONLINE CERTIFICATION COURSE, and the number 6.

So, the meaning of went beyond architecture and design was, so what was there from the classical era to in renaissance and till industrial revolution. So, all these expressions were figurative and in modern they wanted something as a new... a new style of expression. So, they discarded everything and went beyond architecture and they have not taken any inspiration, they started leaving all this inspiration what was their different in different isms. They left all this and started going back to the different kind of visual inspirations. So, that is how they started going from figurative to abstract because most of this expressions were very figurative.

And they have when they say that is its going beyond architecture, but they did not completely ignore the influence of these. So, they have taken inspiration from few of the styles, but then they made it into an abstract expression and braking nature, so this is what the abstraction is braking the nature into a simplistic pattern and form, that is what abstraction did.

And we will look at in the organic architecture and other abstract modernist art later. So, they have taken inspiration from nature, but broken that natural elements into simpler abstract form, which was to some extent, was there in art and craft movement and art nouveau as well. So, it started after industrial revolution and then we see the purity of design and earlier the design when we look at one single design there will lot of different color palette.

So, if we find out the colors used in previous styles there will be different variations of colors, shades and different kind of elements different kind of line quality one will be rectilinear, one will be more curvilinear there will be variety. But here in modernist high mostly in the high modern we will see the purity of material in architecture. For example, brutalism we will discuss this later. So, they have used concrete and concrete is extremely and they have a over powering design language and the concrete was not cladded with any other cladding material or even the plaster and not even a color. So, concretes' own texture and look was the aesthetically meant.

Even in the international style the glass steel was used and there was no other different color added, only few colors were added but those colors were only primary colors and black and white. And purity of form, in terms purity of form they have when we see purity form it's like geometric pure form which is triangle, circle and square or cube, in a 2D or in 3D it will be like cuboid and cylinder and those few geometric forms were used.

And then new material was definitely imbibed and they have used their used the new material in the process, that is also started in art nouveau, new material and new technology was there in art nouveau. That's why art nouveau was flourished in more domain more creative domain than art and craft movement.

So, here we will see some of the examples which will talk about these four features these are the four main features there are many other features and these are the key features which we will see in the high modern. But there are different modernism in the specially in the initial phases there were different thoughts and still it did not coincide and different movements in modern in first phase like Bauhaus, Chicago school, organic and art deco they were different from each other and they cannot be clubbed as a single identity. That is why modernism feels one variety.

And here we will see some of the example this is F.L Wrights' falling water building.

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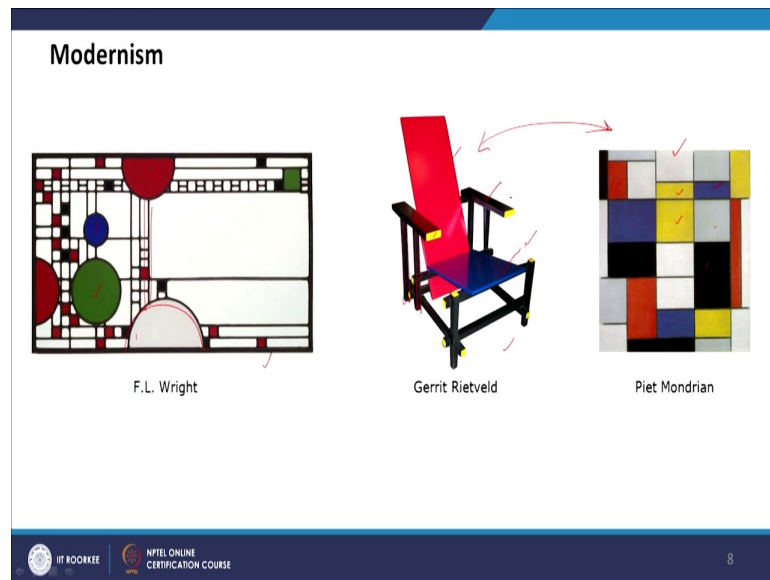


So, if we look at the abstraction and how they have abstracted the nature. So, here if you look at these are the stones and which we see in the nature and if we look at in visually, so this is solid and void juxtaposed and then it was continued in the building. So, solid void, solid and void and then again solid which is the concrete and the solid cuboid of the concrete slab and then a fragile glass which is void and then again solid and then void, so it continued, what nature gives as an inspiration. So, building continues that. And even if you look at the material which is stone and that was combined in the building elements. We will discuss this building which is a very important building in a organic movement later. But this how the abstraction is.

And then we have Vincent Van Gogh's one of the famous painting style in night. So, here landscape of a night sky is dividing in a very abstract form. So, the nights sky was very painted in a very fluid and fluid form and then this impression, as main feature of impression is the painting this kind of solid thick colors were used. And if you look at this orangish, yellow and blue which is the complementary color juxtapose give very shimmery effect and even though a fluidity of this, this landscape also gives a very abstract expression.

Here we have William Van Alen's Chrysler palace, and here also we are discussing in the previous class the wing of the bird is broken into a geometric abstraction.

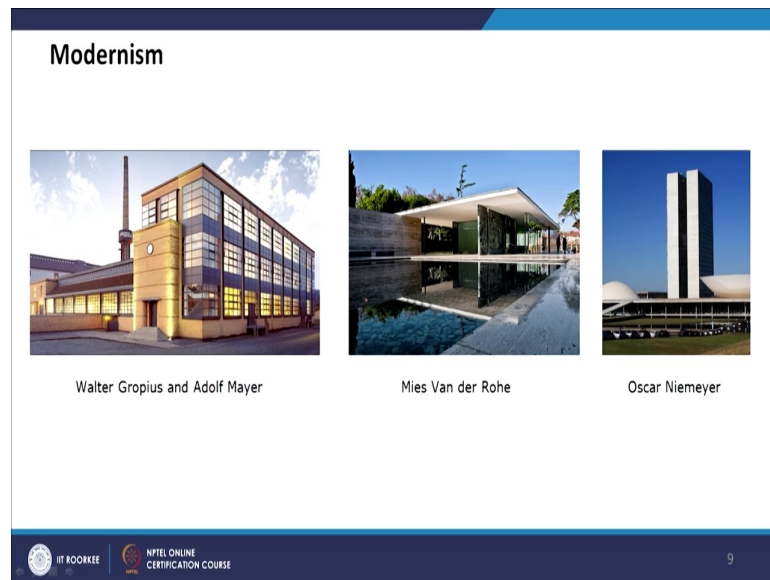
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Also we look at the pure color and here it is a Gerrit Rietveld's chair. This chair is might not be very ergonomic, but it was broken into a pure geometric form which is this is an assembly of different cuboid. And if you look at the color this is all primary color red, yellow and blue and that together creates the chair. And this is a very geometric and absolutely only one kind of geometric form is used which is cuboid. So, this is of a different types of cuboid with only primary color and black, and black and white is used with the primary color as well.

This is Piet Mondrian's painting and these two are of the De Stijl movement we will discuss later. And here the painting was also using similar color palate with black and white and grey and this is F.L Wright's painting which also has a similar the thought process and here the pure geometry circles and straight lines were used you know painting. And here he is also using red, blue and instead of yellow he is using green, but you can a similarity of color palate.

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Now, when we talk about the materials a new material was a overly used and new kind of look asymmetry in the building. For example, this is again a cuboid and the structural elements which is steels are aesthetic elements as well and then we see the concrete steel members and the glass as the aesthetic and expression of the building. And here we see an absolute cuboid which is a part of a movement of Bauhaus where the function they were talking about the functionalism.

And this is a Walter Gropius and Adolf Mayer's Fagus boot factory. So, again we see the similar expression in the Mies Van der Rohe's design. So, this is German pavilion in Spain and here also you see juxtaposition of very straight abstract geometric forms together. So, stone is used as... as its own texture and here also we can see it is repeated within the water body as well. So, here the stone pebbles also kind of complements the stone wall over here, and here you see the purity of material and with the white and black color. And also purity of form can be seen in Oscar Niemeyer's design. Here you will see pure cuboid as and the part of dome.

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Now, if we look at from architecture if we look beyond architecture and look at the design and here that time if we look at the fashion of that era. Before industrial revolution if we look at the way people use to wear the clothes they were the hats, could have been exaggerated, and with the feathers and other floral ornamentations specially for the women's hat.

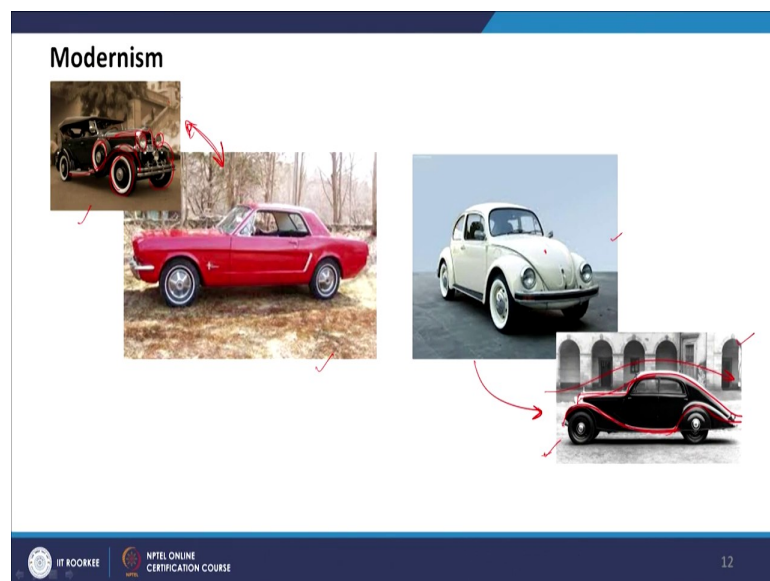
But here in you must have heard about Coco Chanel, she designed working woman's attire. So, that time industrial revolution lot of influx of people was there from village to the city and then new working class people emerged. So, these working class people because of emergence of this working class people there were lot of offices as well as railway station and communication and this social system of Europe changed and this working peoples' dress could not been something like the old fashioned design which was not suitable to go to daily work.

So, these kind of floral hats were changing to a very simplistic hats which was designed by Coco Chanel, and even the color... of color was used black, the blacks suits emerged and become very highly popular over there. Before that there was a lot frills and other ornamentations were there in the suit and the all these elements were cut down from the fashion and it was very clean and generally white and black with a black tie and black bow was the style of modernist movement.

And so not only in architecture design even in the fashion it was changed. So, Coco Chanel designed a fashion brand which is the Chanel which is still now one of the high fashion brand there, and you definitely have heard about the Chanel number five perfume bottle which is one of the most expensive perfume bottle and if you look at the perfume bottle its one of the simplest design till now. And then the perfume bottle is absolutely cuboid with a glass box and one of the most, world's most expensive perfume is inside, and if you see the level it is absolutely clean and look at the font used and this is also there is no ornamentations. So, in modernism here, the modernist movements specially the internationalist movement within the modernism talks about the minimalist approach and this was celebrated in the fashion and product design.

So, this is an example of product design and typeface design as well, so minimalism started from there.

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And even if you look at the automobile design this is one of the muscle car this is Ford Mustang and Volkswagen Beetle. So, this one European car and this is a American car. So, here in if you look at the design of Ford Mustang, so this is pure rectilinearity and we will see a car which was before that... before this... before modern. So, here this car is absolutely rectilinear and no, no curvilinear circularity was added within the car. So, on top of the car is also this is parallel to each other and even if you just look at the line this continues here and so there is a rectilinearity and the design has a one single style. And

this car comes in generally if you look at the car's color it will be in red, yellow and white and black. So, this primary colors and white and black was overly used and if you look at the Volkswagen Beetle, this has a complete circularity. So, this top of the Volkswagen Beetle could not have been straight line because to maintain the circularity and going constant about the circular features.

So, now look at the previous car which was there before. So, this was something one of the first car which was pre modern; so when just when the industrial revolution started. So, here the cars were different elements were just added. So, now, if you look at the head light its head light was added differently, then this part is different and then the wheels add a different element and lot of things were and different and it was a combination of different elements. So, from here this coming to this is a way simplistic approach of designing a car.

Now from here we will go back go to the further down. So, this is a newer car than this. So, this was in the high modern era where there was a celebrating minimalist approach and now after that, this is streamlining when which we were discussing this is definitely not like this, this is the first one then it came as a minimalist approach then the stream lining. Streamlining talks about a curve, so it, which mixes different curves, but still which will be holistically one single design. So, this talks about the aerodynamic feature of the car.

And then when we were discussing the in architecture also they blended the functionalism with the form later, in the later stages of modernism. So, here we see a one single curve which is flowing from the top of the car even from the bottom, but here it was not. It was adding different elements together and making a car it is more engineered and the design style came and then the newer design style which is streamlining.

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Modernism
Phase I (variety) Form follows Function

1. Organic
 - ✓ Robie House (Prairie School); Chicago; Frank Lloyd Wright ✓
 - ✓ Falling Water building; Pennsylvania; Frank Lloyd Wright ✓
2. Functionalism
 - BAUHAUS school: Europe
 - Fagus Boot Factory; Walter Gropius & Adolf Meyer
 - Bauhaus Building; Walter Gropius
 - CHICAGO school: America
 - The Chicago Building; William Holabird & Martin Roche
 - Prudential (Guaranty) Building; New York; Henry Louis Sullivan
 - "Form follows Function"

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So, now if you look at the different modern phases the first phase of modernism was variety, because there were different kind of styles because first phase if you look at first phase before that there was a phase where absolutely two different style was there. One is going for the machine and which is lot of which was totally abstract and another was against the machine were lot of ornamentations was there.

Now, in the variety phase there were different isms evolved, where they were different thought process and they were not... they are not based on the single thought. So, we have organic which we have showed earlier. So, there was a expression... this evolved in USA. So, it took the inspiration of prairie.. landscape and they took inspiration from nature and made it more abstract to generate their visual style, Frank Lloyd Wright was one of the pioneering architect of this style even in a organic phases there were little difference in organic; prairie style and other organic styles. So, we will discuss that when we talk more about this.

And then there was functionalism, they only talked about the functions. So, function has to be the primary pivotal thing and the form will evolve later. So, form will follow the function. And then we have the Bauhaus which is European school of thought and then we have Chicago school which is in which flourish in America. So, we have, let see some of the examples.

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So, this is how the organic and prairie school of design looked like. So, all these lines and the elements were taken from the prairie a landscape of USA. So, there with this horizontal line and these kind of a color were there in the prairie, prairie grass land and from the nature, natural color palate they have taken this lines. And also you look at the inspiration was there from the traditional pitched roof building as well.

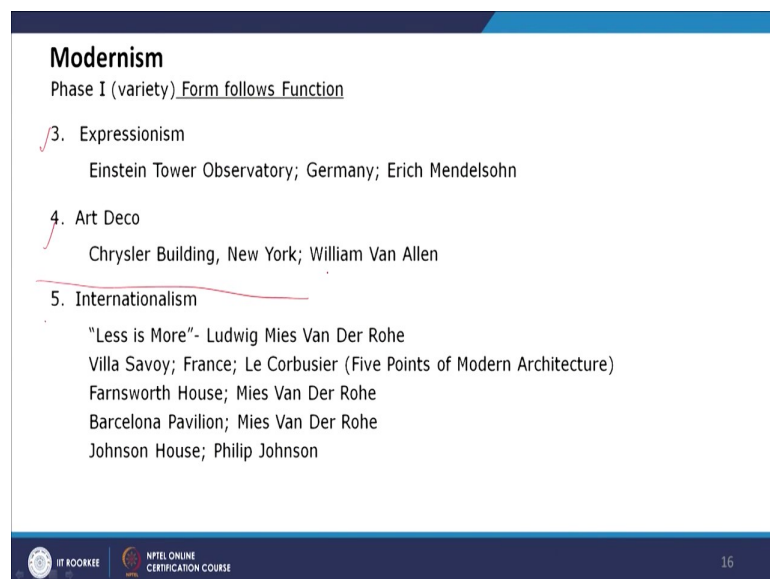
Now, if we look at the functionalism. So, these two are the examples of Bauhaus school of art, and here is the name of the building. So, Fagus boot factory and Bauhaus building by Walter Gropius and Adolf Meyer. And we have the Chicago school of design where William Holabird's, Chicago building is one of the examples.

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And we will discuss also about the Chicago window and the style. So, this building was generally divided into the three different style, but still we you can see absolute box like cuboid structure.

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And then also in the phase one we have expressionism, art deco and internationalism institute to some extent in the in between the phase I and phase II, and art deco we were discussing art deco and expressionism was again opposite to the functionalism. So, there

were lot of ornamentation in art deco and which have taken inspiration from art nouveau art and craft movement as well.

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And expressionism was also talking about, it was against the extreme functional approach of functionalism which is a, and this was against the Bauhaus and Chicago school of thought.

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And then again it is again opposite to the expressionism and art deco again a minimalist approach which is internationalism, again a box. So, in modernism we see again once

they going towards the functionalism and minimalist approach and again they are coming back to aesthetics and again they are going back to the minimalist approach. And so this was in the first phase.

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Modernism
Phase II (unity): Function Fits into Form

5. Monolithicism

1. Box: rectilinear, right-angled, cuboids
MoMA, New York, 1932; Edward Durrell Stone, Philip Goodwin
Huntington Hartford Museum, 2 Columbus Circle; E. Durrell Stone
2. Grape Bunch: Same size, Different size
U.S. Pavilion, new Delhi, 1959 world agriculture fair, Minoru Yamasaki
U.S. Consulate, Tabriz, Iran; Edward Larrabee Barnes
3. Twins: Same size, Different size
Old World Trade Centre, 1963; Minoru Yamasaki
Lake shore drive apartments; 1956; Mies Van Der Rohe
Marina City; Chicago, 1960; Bertrand Goldberg

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And in the second phase we see more and more holistic, more and more constant thought like in first phase we have different "isms" which were opposing each other, but in from the second phase onwards we will see more holistic style which was followed more internationally. And so, we have seen monolithicism where they have talked about a form and which we will function will fit into the form. So, form and function together.

So, here we mainly take different kind of abstract geometric form for example, box, twin boxes and grape bunch which is different-different same module which is also genesis of a modularity in the design.

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Modernism
Phase II (unity): Function Fits into Form

5. Monolithicism

4. Circle:
Govt. Centre Brazil; 1957; Oscar Niemeyer
Olympic Games Stadium, Rome, Pier Luigi Nervi
Borodino Panorama Building, Moscow, 1957
Roofless-Church, Indiana, 1060's; Philip Johnson


5. Metastasis: (repetitive, Le modular)
Sainte Marie de La Tourette, 1956-60; Le Corbusier

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And then the circles and metastasis is another way of making a form which we will just talk about it later.

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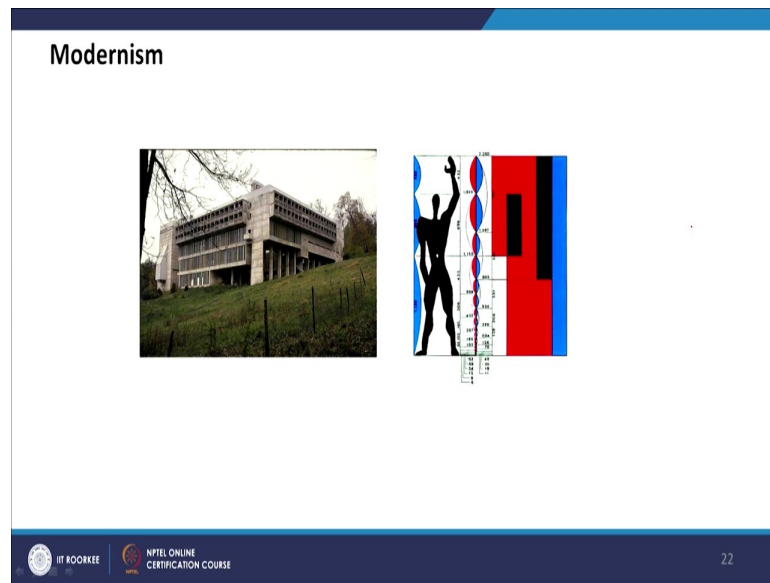
Modernism



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And so if we look at, this is MoMA and this is a way of grape bunch. So, same module was repeated and then twin box and then circularity and again box with circle.

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And here there is a metastasis. Metastasis is a is it talks about a unit which is a proportion this is done by Le Corbusier and this is followed in metastasis also it followed in brutalism later. So, we will see the emergence of brutalism because here in brutalism also, brutalism means that it exposes the concrete and here also we see in this building there is a similar stylistic approach is there.

And this form is emerged from a critical proportion. So, all these building for facade and is designed in the way and the fenestration has emerged from particular proportion. We will discuss the brutalism and metastasis later we will understand what is a proportion.

So, form can be evolved from pure geometry and also it can be evolve from a particular repetition of a proportion. And here also it can be a modular. So, one module can be repeated later. Later we will also see a modularity in the design in the phase III in the metabolism, but in phase three there is a formal function more holistically clubbed and we see a different kind of form together.

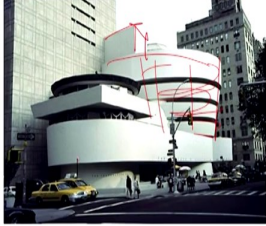
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Modernism

Phase III Form + Function: with equal emphasis

Sculptures & Function: Form negotiates with Function

Guggenheim; New York, 1959; Frank Lloyd Wright)



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So, one cuboid and one another, another part of a frustum and then together creates a building. And this is one of the famous building Guggenheim, Museum by Frank Lloyd Wright. And the interesting thing was this gallery as a spiral and when you go inside there is a courtyard and atrium from there you see the total exhibition of the Guggenheim museum.

So, here form a function together and form negotiates with function and so form and function more in more mature way of, in mature thought process it came together and went and it was kind of intertwined.

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Modernism
Phase III Form + Function: with equal emphasis
Sculptures & Function: Form negotiates with Function
Ronchamp Cathedral, 1954; Le Corbusier




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Now, also see sculptural qualities into these. So, again its Le Corbusier design where sculptural form is there and again form negotiates with function this is Ronchamp Cathedral by Le Corbusier, giving the phase III.

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Modernism
Phase III Form + Function: with equal emphasis
Sculptures & Function: Form negotiates with Function

- Shell Structure (Concrete)
- Tensile Structure (Steel)
- Pneumatic Structure (inflatable)



Dulles International Airport, Washington ; John F. Kennedy ; New York, Eero Saarinen

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Now, also in the phase III we have the shell structure which is which is a kind of contemporary to the streamlining where the structural elements also becomes aesthetic element. Here a shell structure which is made out of concrete become we will see the

example and then tensile structure which is from the steel as a structural element is also the aesthetic element and the pneumatic structure which can be inflatable.

So, here we have a concrete structure which is Dulles International Airport by Euro Saarinen, and New York John F Kennedy airport which is also by Euro Saarinen. Here we can see the shell structure which is a totally a concrete structure is also a aesthetic element and it takes form of a flying bird.

Here also the structural elements were exposed and this is the aesthetic beauty of the airport. So, here the structural members are these columns which was tilted and then the slab is also tilted and which creates unique form of a... of the airport.

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Modernism
Phase III Form + Function: with equal emphasis
Sculptures & Function: Form negotiates with Function

- Shell Structure (Concrete)
- Tensile Structure (Steel)
- Pneumatic Structure (inflatable)



Olympic Stadium, Munich; Frei Otto

Olympic Stadium, Tokyo; Kenzo Tange

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Also with the steel we have the similar examples with Kenzo Tange's Olympic stadium. All the steel members creates aesthetic element and a new kind of form is emerged out of the steel structure.

Even if you see the Frie Otto's Munich stadium also has this steel tensile structure as a structural as well as the aesthetic element.

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Modernism
Phase III Form + Function: with equal emphasis

Sculptures & Function: Form negotiates with Function

- Brutalism
- Metabolism ✓



Yale School of Art & Architecture, Paul Rudolph

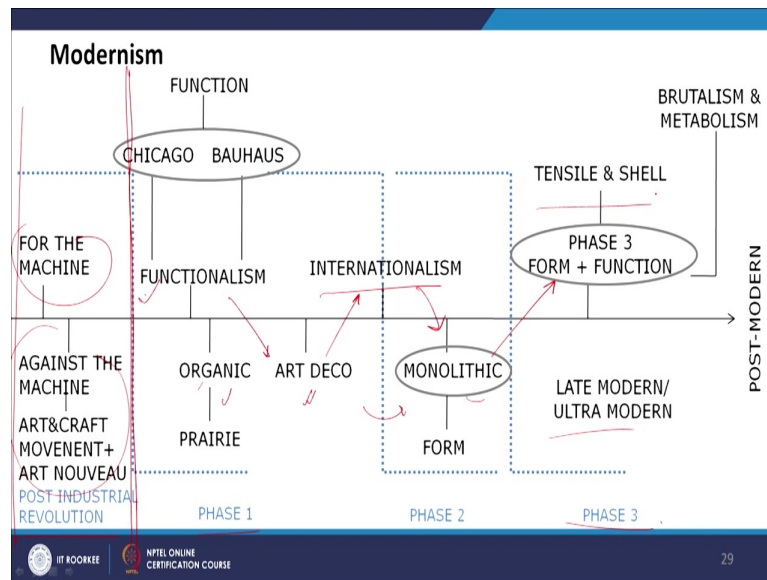
Nagakin Capsul Tower, Tokyo, Kisho Kurokawa

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Now, in brutalism and metabolism we see services as an aesthetic element as well. So, here in this service course are created as an aesthetic element also in this capsule tower you can see the repetition of the same modularity. So, this modular concept was also there in the modernism and also in furniture design we in George Nelson's design we will see the modularity in design, which emerges from the modular, cubical, design of office cubicles and modular kitchen design all these designs emerged from this modernistic era.

And also in brutalism we will see this is also we can see the service course as aesthetic elements, but the main feature of brutalism was exposing the facade as a concrete and there is also a big brutalism exposing the facade as the as the as the brick facade. So, no plaster will be there on the brick or the concrete facade. This is how in the totality architecture modernism were there.

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So, together if you look at modernism, so here it is and from the first phase which is pre modern to this, so post industrial revolution from here we start the modernism. So, for the machine movement and against the machine movement this is post industrial revolution. And from here we start the modernism phase one and as we were discussing first they are going to as a functionalism, and then little then again it that was the aesthetic elements, but that time they have taken the ascetic inspiration from nature which is organic and prairie.

And then again it was the complete ornamental expression which is art deco which is against functionalism, and then again going back to the minimalist approach which is internationalism. And then the monolithic form and function where the form function together comes, and then in late modern or ultra modern area phase III we have a tensile and shell structure where form and function kind of blended together. Well, where in tensile and shell we have structural elements the ascetic elements, and in brutalism we have the purity of material, and in metabolism we have the services as the aesthetic element. And later we will discuss each and every "-isms" of modern architecture in detail.

Thank you.