

Ergonomics for Beginners Industrial Design Perspective

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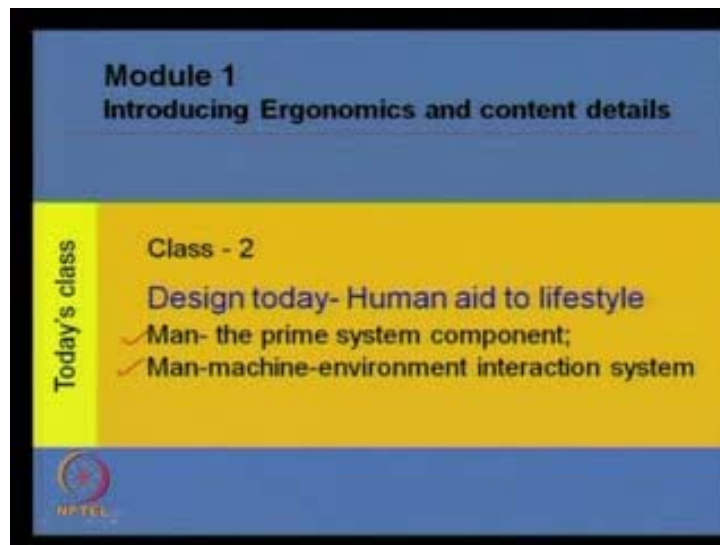
Module No. # 01

Introducing Ergonomics and content details

Lecture No. # 02

Design Today - Human Aid to Lifestyle

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Welcome to this second session of ergonomics for beginners with special reference to industrial design perspective. Now, this is within the first module, that is, introducing ergonomics and content details. Now, this is the second class. So, today's class will be on design today; that is, human aid to lifestyle and within that the specific backdrop will be man - the prime system component and man machine-environment interaction system.


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Module 1
Introducing Ergonomics and content details

Class 1 Introducing Ergonomics and content details
Overview of ergonomics and design relevancies
Brief of the subject matter and Industrial design
The course Syllabus

Last class gist

- Progress leads complexity . and
- There is a **constant struggle to adapt** changing environment with newer ambitions and life style aids with **limitation of human capabilities**
- Design development need justification




Now, in last class under introducing ergonomics, there we mentioned the progress that had happened due to man's regular need for newer developments and that is the progress. This progress leads complexity in our life that we need to adopt and we have to struggle. There is a constant struggle to adapt **adopt** changing environment with newer ambitions and lifestyle aids with our limitations of human capabilities; that is physical size, psychological or behavioral pattern as well as physiological tolerance limit. Design development need justification, we have to justify the developmental needed. **And accordingly do that was discussed.**

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Last class gist

*Design looks into aiding and facilitating arm to the human natural ability, and relevant human information and the means and methods of applications of those information in such endeavour is the area of **Ergonomics**.* ✓



Accordingly to that, it was discussed and also finally, we mention that design looks into aiding and facilitating arm to human to the natural ability, and the relevant human information and the means and methods of applications of those information, in such endeavor is the area of ergonomics.

Now, with that today, we will discuss the design today and how it influences our life and what may be necessary to think.

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Now, suppose if we see the design today with this figure, we can feel that the new user is looking at this furniture set and it gives newness. Now, why people go for purchasing new things, so why we like it; there must be something **that** design. So, now we can say that we feel after seeing some product, we feel happy to purchase it, we feel to have it why?

Now, being happy does not mean that everything is perfect, but still some item we feel new; we feel yes it may be good; it just means that we have decided to see everything beyond the imperfections. Now, we like it, but like means how we like it? This limits against what costs? This likingness against what cost; if it matches with our requirement and our aspiration and if it is compatible to our body size, our behavior, our physiological tolerance limit, then we can say it is a good design; we can have real happiness after getting that product.

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Now, again the another need is the convenience, now how it satisfies? Now, here design is a commodity. Now, suppose this product is a handled product, now it tells that it is a cell phone. Now, this cell phone it says that - now how to hold it. This product should say about its usefulness; after seeing it if it fulfills our aspiration then only we can say that it is a good design and we may like it to have it.

Suppose this **if this** is a handled product; now it has a cover. Now, while I keeping this inside the cover. So, to use it whether we need both the hands or it should be single handed operation. So, these factors also make a difference while selecting a product; all these things we need to consider while developing the product concept.

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So, now the product is also the commodity and the design is seen as a commodity. Now, another thing, we can say that design it also gives a way of learning facility. Now, this is inside a car, this is a sound system, **now this boy the child sitting side of his father.** He also tries to operate this machine. Now here, so many things come whether the product would be first time users for or it is to be used by an experienced person. We are not sure.

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Now, here the two things come that is that usability aspect. Usability means the usability of the product is how quickly we can understand, how to operate it and a product should tell these factors from its own appearances. Now, another thing comes that is called reusability. This reusability **this term** means after learning this product, how to use it. Now, if we stop using for some time and after that again, when we want to use that whether we can retrieve the information that we gathered, when we used it first. So, how we can reduce this retrieval of earlier information and how it can reduce the learning period to reuse it?

So, the design should give this facility, usability aspect and reusability aspect. Now, how for this we must need to know the persons mental capabilities and this is one of the factor of ergonomics that we are going to discuss in other classes.

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Design is also an amusement. Now, if we see this figure - in this figure, it says that this boy is trying to play with this item. Now, several factor comes here, first one thing comes that is safety - if that boy uses this product then whether it is safe from his behavior point of view; second is that body match: body dimension match - if this boy does not fit with the features provided in this design; he may not like to use that. So, like and then another thing comes, his pleasure value- if this boy while operating or while using this product he does not feel good that pleasure. So, then he may not use that. So,

all the products should be designed or while designing we should consider this aspects then only we can say design is amusement.

Now, if we see one example that is a knife, it is a very helpful product and at the same time it also can be used to kill a person. Then among these two aspects, one helpful and a negative aspect of this design which aspect to be stressed upon, while designing it. Then depending on its contextual use mode, we have to design the product. So that this product we may need to do certain guard system to this product and at the same time the design features should be maintained in such a way that it should give a learning facility of dangerness. Otherwise, what **is** happens there will be mistake and accidents.

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Now, if we see with another example. This example is a context specific design example. Now, this type of mosquito nets have come in the market; now this mosquito net envelop **very** vary in different sizes; this may be used for outdoor use or maybe indoor use also; person can go inside and there is a small bed type of area where they can sit or lie and this is a total work strength space envelop.

Now, the specific need developed a design that creates insects and other harmful creatures free personal space around man suitable for certain activities. Now, with this design, another design thought have come up and some people have tried to work on it that is normally at home or some or in someplace hotels and etcetera, we use air condition room while sleeping; now to cut the electricity cost a thought has come, why

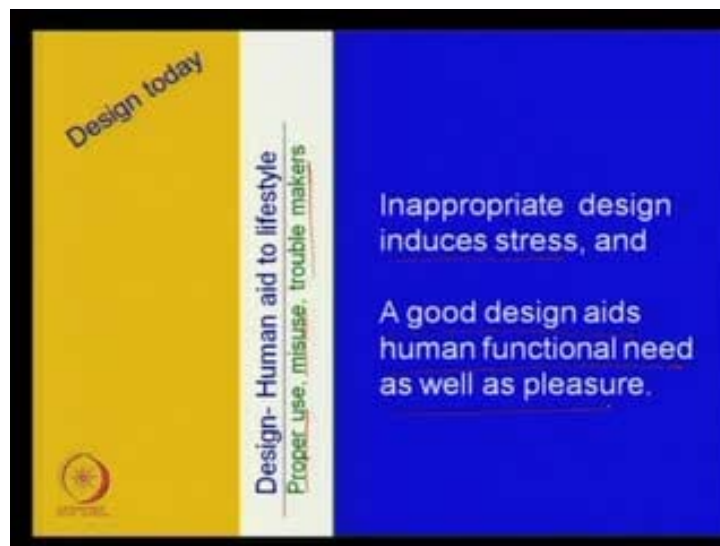
not to make a miniature cot with especial envelop. Here if a person sleeps like this, then within this envelop if we can have an AC inlet, then we can say we can create micro environment, it looks very nice.

Now the problem comes, if air flows through here, then either there will be a circular motion of air comes this end or this end. If we keep at this area, and then it also will do the same air flow. So, there will be a circular air flow and that inside person, it may be difficult to breathe or people may not like that a circular motion on his body.

Then, another thought came, why not to make a double layer air condition, a double layer envelop and then within this space the air conditioning inlet will be there and outlet also and so air will flow within this. Then, there will be some small openings from where a controlled air movement will be there. So, by this way some newer product development concepts may come. So, this product it may not be feasible or viable at this moment whatever **is has** been drawn here, but it can give an idea to develop a further product.

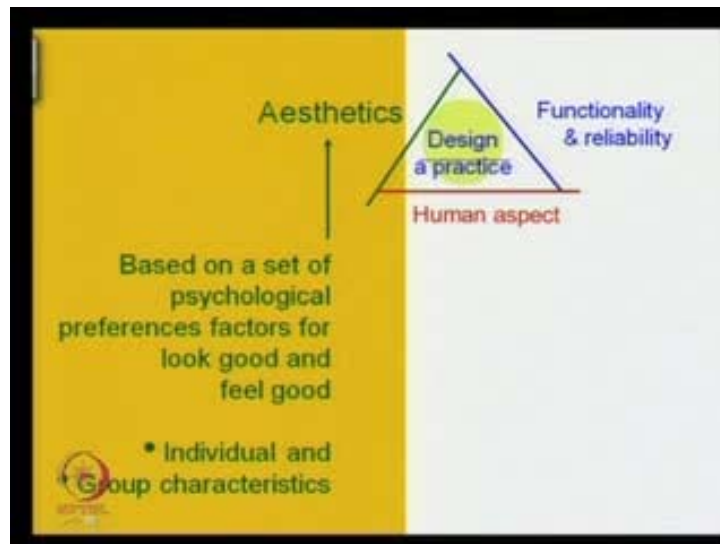
So, design should be context specific. Now, what we have considered here, the need cost efficiency then persons comfort feeling and the context, where we are going to use this and these aspects in some as a whole we can say as a ergonomics area.

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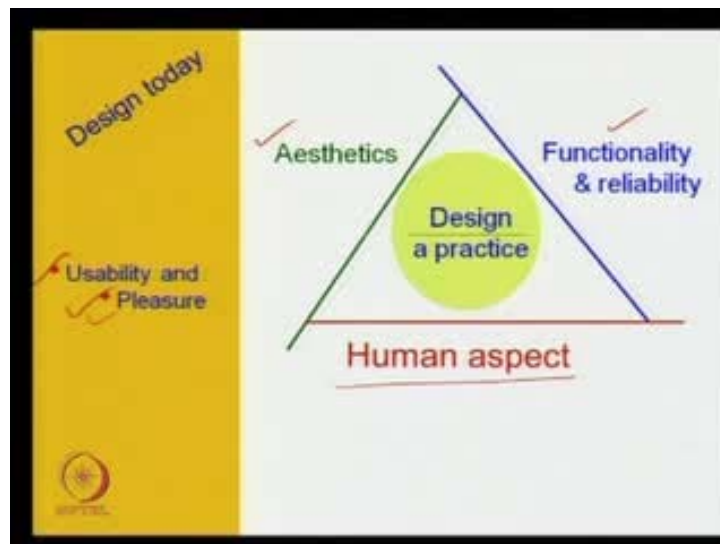


Now, design the human aid to lifestyle, if it is properly used then it is very good. **if it is** We do some misuse kind of thing then, we cannot say it will results in a good and sometimes it may create trouble makers also inappropriate design induces stress if by choice or without any choice. If we can get a product and if that product, while operating, while using it, if it gives problem then we may not like to use it further. So, it gives a trouble maker in market there is so many designs are available that can sighted for this.

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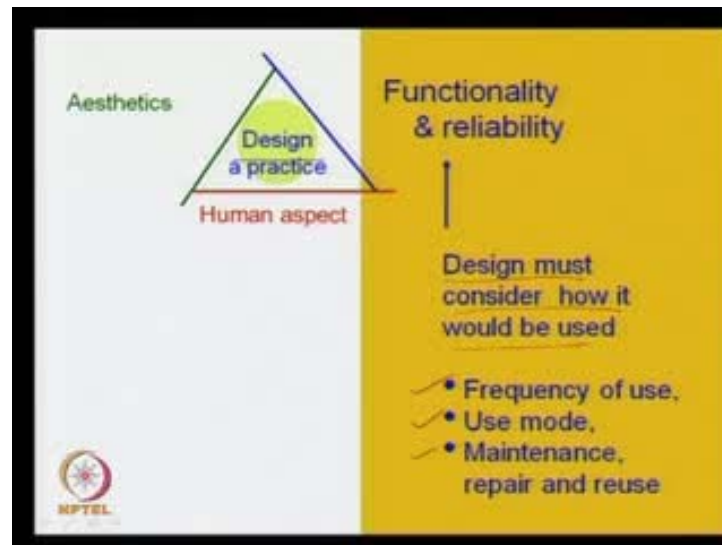


So, a good design aids human functional need as well as pleasure value, not only the functional need. Now, what is the pleasure value and how we can define it now design requires usability and pleasurability. These two things have to be there now it is said that today's design has crossed its aspiration that is pleasurability value beyond usability aspect. Now today, if we see the design is a practice. Now it has three arms; one arm is the aesthetics, if product is not aesthetic, if I do not like it, look then I may not go for that product.

Functional reliability and functionality and reliability for the purpose, I am using this product or this design. If it does not have that purpose that function then there is no point of using that reliability. If the function is not reliable, enough then that product we cannot say is a good product, good design and finally the total base of the total today's design is on human aspect. Now we will try to describe this aspect in next slides.

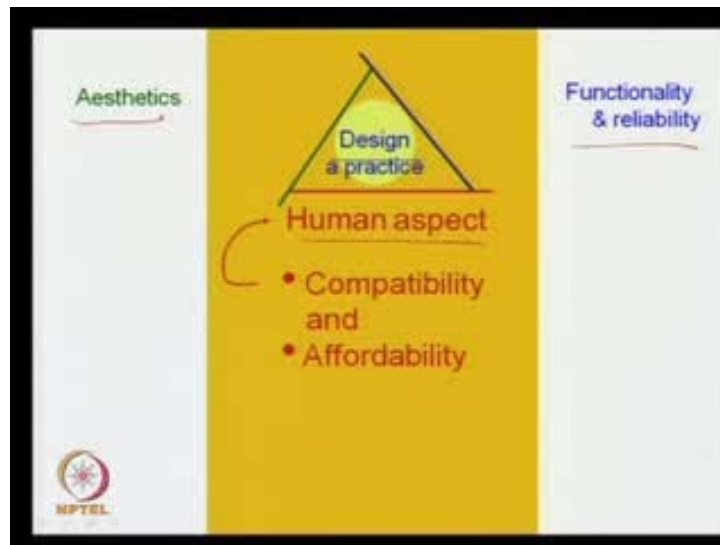
Now aesthetics means based on a set of psychological preferences factors for look good and feel good now. Another factor is that of these psychological aspects and preference factors depends on individual requirement or individual basis as well as group characteristics; I may like one type of design and as a group in a family or some. Suppose if I may like a television set this is my personal liking but in my family most of the members, if they do not like that television set so obviously, when I purchase a television set, is it not only for my personal use? for my family use, then my choice, individual choice will not stand long. So for certain use or certain selection of product individual factors and group characteristics both have to be considered.

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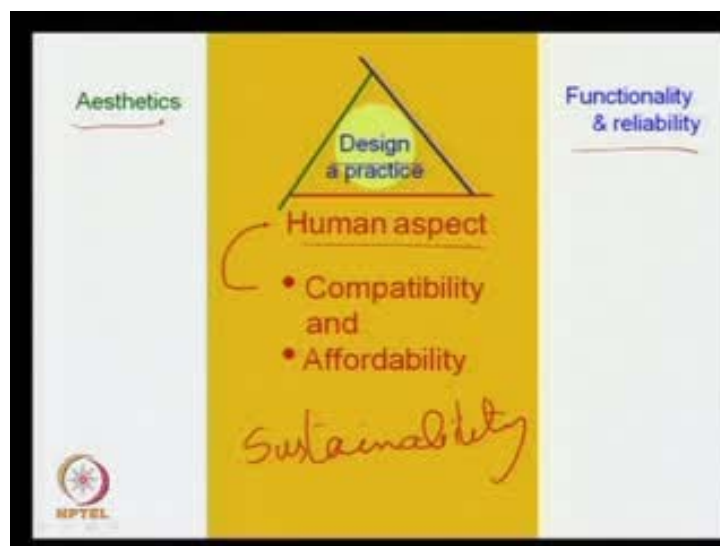


Second is that functionality and the reliability under this we can say design must consider, how it would be used that frequency of use there are certain products where some live hinges are provided that is with some plastic type of material. So if many times, if we use it may break, so the frequency of use we need to consider and accordingly material selection and etcetera has to be done used mode how we want to use it in and maintenance repair and reuse under this reuse. This is again comes physical reuse and psychological mode of reuse physical reuse mode is that repeatedly using. So it should serve its functionality and reliable function and psychological thing, is that while second time using how fast I can understand or I can operate this product.

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Now the human aspect though this aesthetic value and functional reliability both depends on human aspect human aspect means compatibility and affordability compatibility in last time also we said, that physical body dimension wise comfortable means, if I have to operate it then whether I can operate it like this is the physical matter and affordability. Affordability is that cost factor and etcetera. I may like it but how I can have that so and also another thing comes that is called sustainability. Sustainability means without external support how this product can sustain means I can use it for longer time with the resources I have near me.

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So, means as a whole if we consider aesthetics functional reliability and human aspects it gives a good design this is a product. Now when I enter in a electronic shop there are many items are displayed one side maybe some television sets, one side sound systems, one side some other items like that when I enter if I have some pre idea of buying a television set while entering, I will be guided with that intension and my head or my eyes will try to locate which side is the television set and then my head will turn towards that and physically. I will move towards that now after seeing many television sets one television set I may like it and then I will go there and then I will try to understand or recognize what are the specific features available there and whether it matches with my requirement.

So, the factors what factors play a role there it will little difficult to say but if we understand the current faculties in my mind and body decides among this decision then we may get some result inferences and that if we can use in my product in my design then it would be a wide acceptable design.

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So, design today is design is a continuous problem solving process with conversion of ideas into reality, keeping in mind the user's characteristics and limitations, art and aesthetics, value material and process, and new technology. Why new technology? Because we may have some ideas, but whether this idea can be produced because design is for mass production.

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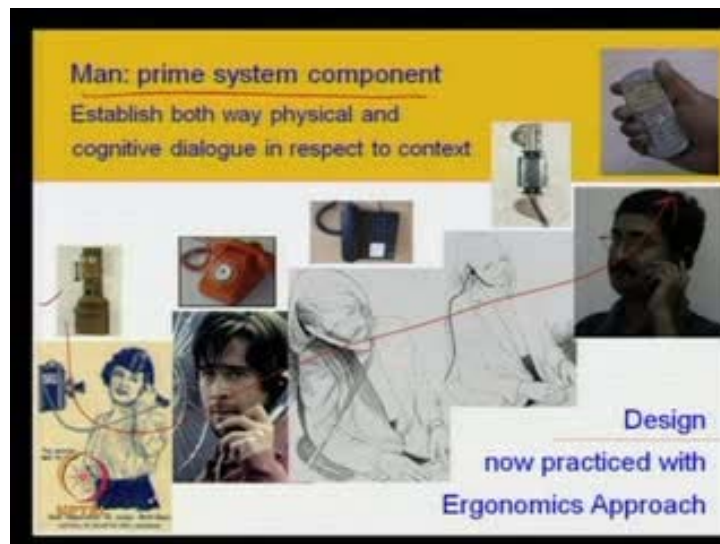


Now design is an innovative process is a practical matter. So you have to develop some practical matter, so that people can use it feel it and it should be reproducible unlike art

masterpieces it has to be reproducible in a mass production wise means design should cater many people with a single need to justify.

So, design is an interactive practical reproducible solution to conceive various aids to human needs. When I have some limitations in my eye sight, then I have to design this spectacles functional spectacle two glasses and to hold this glasses two arms are there but when we add some aesthetics in it. Then there are varieties of glasses will be there varieties of fittings the product will be there. So like that the design is innovative practical and reproducible solution to conceive various aids to human needs.

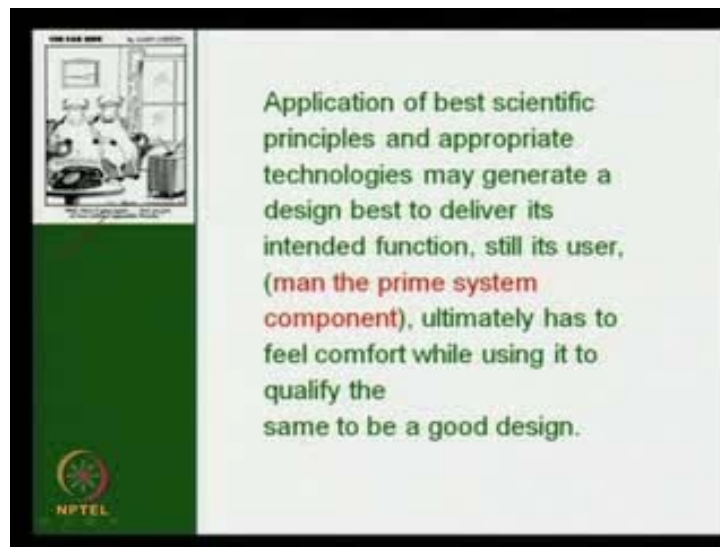
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Now, whatever we have discussed till now, this is not the designing isolation design and then the users and where it is being used. So, in this system, **who** which is the prime system component? Obviously, man is the prime system component because why we are developing these designs because man needs it, where it will be used in such circumstances surrounding where man is going to use that. So, in this whole system so man is the prime system component establish both way physical and cognitive dialogue in respect to context like if we see the development of telephone system as a product now from on step by step if we can see there is needless to describe all the products here now from here a development is going like this, so finally the product is that a handled device that we can say a product.

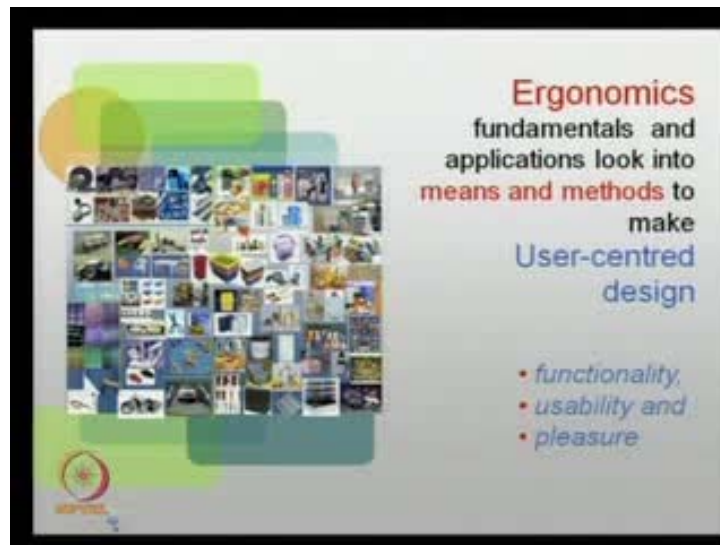
So, why we have developed this now when we speak here it goes somewhere, someone else has to receive this message and etcetera. In this whole system when we are developing this product it is convenience and etcetera, for man only in this system. So we can say that man is the prime system component and design new now practiced with ergonomics approach what is the ergonomic approach that if it satisfies the human compatibility aspects. In terms, of physical body dimensioning psychology all factors and if the operation of that equipment or that design is within these physiological tolerance limit that is the ergonomic approach.

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So, if we see this figure it is drawn by Gary Larson here he says that two cows are sitting in a sofa observing a television set probably and the telephone set is ringing here. But how to lift this receiver? He has no fingers here. So, it says that well there it goes again means a ringing and we just sit here without appropriate thumbs. So, we can see application of best scientific principles and appropriate technologies may generate a design best to deliver its intended function, still its user - man the prime system component-. Ultimately has to feel comfort while using it to qualify the same means the design to be a good design.

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So many products ,are shown here all the now ergonomics fundamentals and applications look into means and methods to make users centered design that is specifically it does it look functionality usability and pleasure.

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Now if we see a typical work environment. Where this lady is supposed to work with this computer alone but the faculty concern sometime comes and gives some instruction or do certain activity here. So the workplace suitable for single person is does not support double person's use then what would be done here a typical work environment that says

a story of man machine environment relation man is the prime system component again is being stressed out here. So if we know the requirement of man how many people are supposed to operate a single design or single workspace of station. Accordingly, we have to design and the mode of use it that was a contemporary practice.

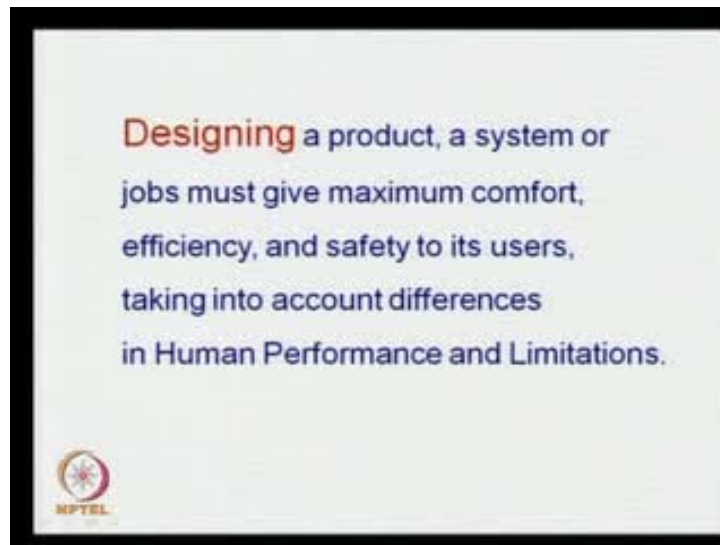
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Now the tradition this figure are from one Buddhist monastery now here it says that they are sitting on floor with low height table top. Where they read some material and for a longer time now fine the tradition has to be maintained but the person's comfort has also be seen now the different facilities are available.

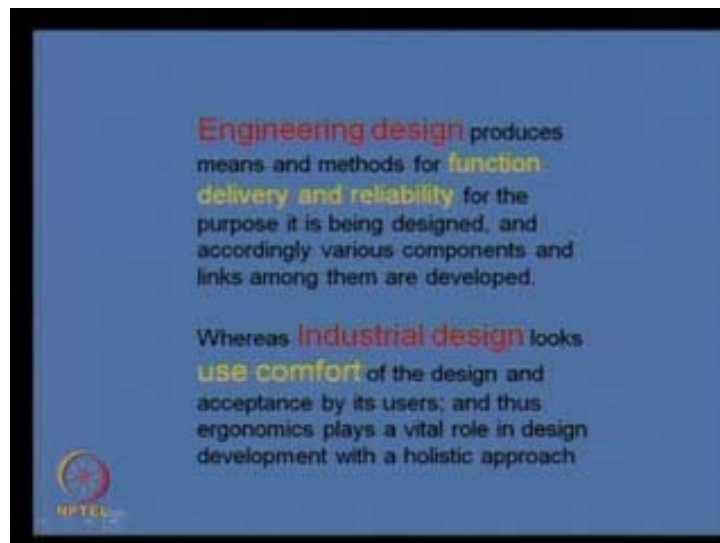
So we can say that the requirements to be seen from the view point of contemporary mindset keeping this task same. How best we can modify or provide a design solution here so that they feel comfort without changing their religious requirement or traditional value that also, we need to consider that provides us the context for developing newer designs.

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Designing a product, a system or jobs must give maximum comfort, efficiency and safety to its users, taking into account differences in human performances and limitations. All persons are not same it differ from one person to another person and also there is a group common behavior that also we need to consider.

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Now, people say that design is engineering design and also industrial design, now if we try to differentiate between these two though both practical goals would be same but still if we try to differentiate their basic features the engineering design produces means -

methods for function delivery and reliability for the purpose - it is being designed. Accordingly various components and links among them are developed means; components are developed the functional links are also developed and then it is given a special hold all the things and if it is functionally sound and reliable that is a good engineering design.

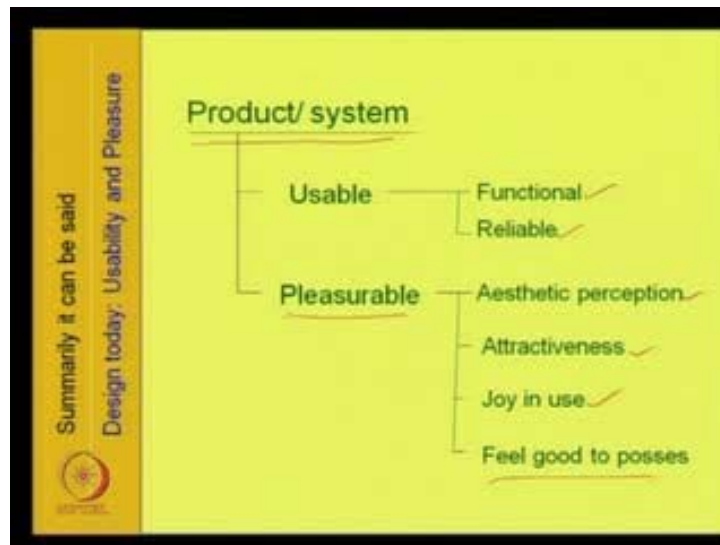
Now whereas, industrial design looks users comfort while using that design and acceptance by its users. Thus ergonomics plays vital role in design development with holistic approach means, the product or the system is developed for function and reliability and at the same time if the users requirement, how to use that or use comfort is seen then it would be industrial design.

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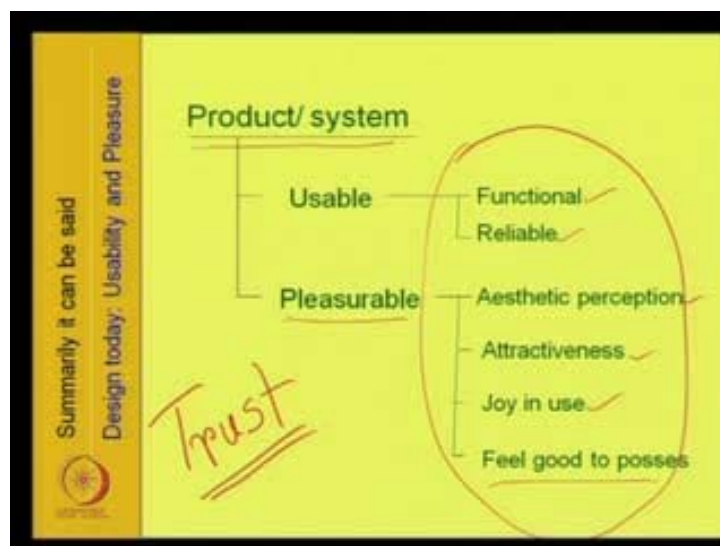


Now, pleasure beyond functionality and immerging area design features are not only to divulge ease of use and safety but pleasure of use enjoyment of the experience a term comes experiential design means what, while using a design it should give you pleasure and enjoyment and while and whatever experience. We are getting it is some bad experience then how we can modify it, so that people can have good pleasure value while using that.

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Similar summarically, if we see it can be said that design today is usability and pleasure where the product and system. We can see under usable and pleasurable item usable is that functional areas functionality. How to make it reliable, under the pleasurable factors aesthetic perception. The whole range of system we need to consider here why people feel aesthetic in a product, why people like it then attractiveness and joy in use feel good to possess. I may like a product that cost too much, if I aspire to have it. It will give me agony only but if that comes within our limit buying limit means affordability then as a whole it will be feel good to possess and if we can have all the things in a

design then it would create a complete trust complete trust. So this trust value has to be in a product and the factor behind it is a scope of ergonomics to study.

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So, this session stresses the scope of application of ergonomics principles along with aesthetic perception factors that leads development of user-centered design to see functional beauty in interaction. This ergonomic principles and the how to make user centered design the details, we are going to discuss in the following sessions in different modules.

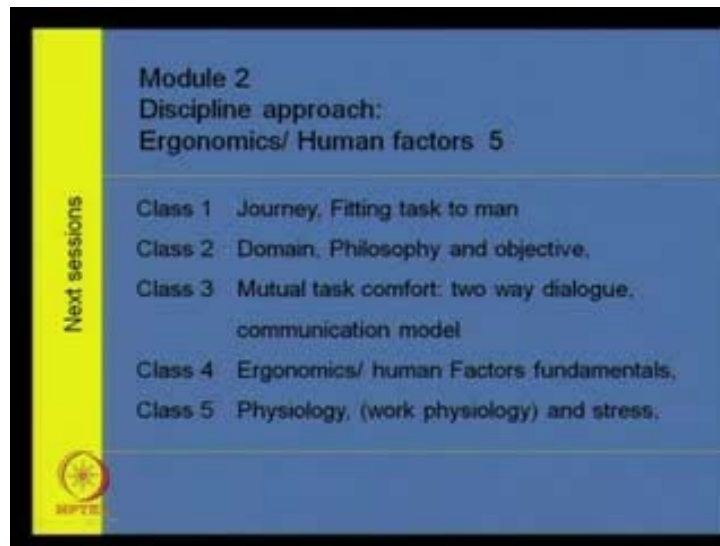
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The whole course is divided in 10 modules with total 40 class distributions.

Modules	Area of discussion	No. of classes	
Module 1	Introducing Ergonomics and content details	2	
Next	Module 2	Discipline approach: Ergonomics/ Human factors	5
Module 3	Human physical dimension concern	7	
Module 4	Posture and movement	8	
Module 5	Behaviour and perception	5	
Module 6	Visual Issues	2	
Module 7	Environments Factors	1	
Module 8	Ergonomic design process	4	
Module 9	Performance support and design intervention	5	
Module 10	Design Ergonomics in India: scope for exploration	1	

So, the whole course as we said that is divided into 10 modules with 40 classes. The first module we are concluding now that is the with 2 classes that introducing ergonomics and content details in next class, we will have module 2 that is discipline approach ergonomics and human factors there will total 5 classes.

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Now this 5 classes are like will be like this class 1 is the journey fitting task to man this journey will discuss the how its origin and its origin from design point of view as well as a discipline point of view. Then it is domain philosophy and objectives and mutual task comfort that is the two way dialogue communication model class 4 will be ergonomics human factors fundamentals, that is mostly the physical and psychological aspects class 5 will be physiology that is specifically work physiology and stress factors.

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So, this will be in the next classes so, with this we can say that this module 1, we have discussed the area of ergonomics and design relation. Now, what is the today's design stands and how ergonomics factors can be used to make design more comfortable more usable and pleasurable to feel to possess it as a pride. So, we will meet next day thank you.