



# ERGONOMICS AND DESIGNING OF INTERIOR AND EXTERIOR SPACES

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## LEARNING OBJECTIVES

After completing this section the learner will be able to:

- explain the concept of design and scope of interior and exterior space design
  - appreciate that Interior Designing and Landscape Designing requires creativity and a balance between utility, aesthetics and beauty
  - understand and explain the principles of art and techniques of planning, designing, equipping and furnishing built in spaces
  - appreciate the importance of incorporating ergonomic concepts in the design of interiors and exterior spaces and making them user-friendly
  - appreciate that a Landscape Designer/Architect is responsible for designing outdoor and public spaces to achieve environmental and aesthetically appealing environment and spaces.
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## INTRODUCTION

Are you good at drawing? Do you get compliments from friends, teachers and others for your creativity in drawing? Do you enjoy playing with colours?

Are you a very imaginative person, full of ideas? Do you have a craving for creating something different, new and unique? If your response to these questions is 'YES' then you may think of selecting a 'Design Profession'. It encompasses several different professional avenues like Interior Design, Architecture, Graphic design, Product design, Fashion design, Packaging design, to list a few. Professional Designers have always been in great demand in industry.

To help you decide whether you have aptitude for interior design, you need to answer a few more questions like — Do you/I like to rearrange the furniture or accessories or soft furnishings in my room or home to make the same space look different? Are you complimented for your colour combinations in paintings, new drapes/curtains, or selection of design? If your answer is 'YES' then you have a natural flair for colour, space, and style and may do well as interior designer, where you can make best use of your natural talents and have your own distinctive style.

If you would like to be a Landscape Designer, then ask yourself some questions like — Do you like plants? Do you like to nurture them/ experiment with them? Do you like gardening/ like to present them in different ways to express your creativity in the form of abstract objects or sculptures? If your answer is positive then you are probably a good candidate for such a profession. Let us learn more about the significance and challenges of these professions.

## SIGNIFICANCE OF INTERIOR DESIGN PROFESSION

Designing is the blend of artistic talents and creativity, encompassing a number of different fields as mentioned earlier. Earlier architects designed the building and constructed it; once the user group/client occupied it, they started arranging the furniture according to their liking and kept adding things according to their needs. In the earlier days the interior designers were approached for designing of commercial spaces as it helps in image building, enhances work productivity by providing a well organised place of work and gives a unique identity and a sense of pride to its owners and employees. In present times, many families desire a well-planned and comfortable yet aesthetic and attractive house which enables them to relax with in a stress-free environment after a hard day's work.

Hence, people now increasingly seek the services of professional interior designers for residential or commercial spaces as they have the knowledge, expertise and guidance that can help prevent costly mistakes in terms of time and money. They work with architects, contractors, supervisors

and different craft persons in order to complete the project smoothly on time, within a specific budget. The interior designer can make most out of the given/available space without compromising on safety, functionality and comfort of the client. The professionals can reduce countless hours of shopping as they know the places where the materials suitable for the client's needs including different climate zones are available. It is indeed a challenge for interior designers to create interior spaces that are unique, functional and give the client satisfaction and value for the money spent.

In order to make a space functional, appealing and satisfactory, an interior designer needs to have an '**Ergonomics approach**' in her/his work.

*Let us briefly understand what Ergonomics is.* It is concerned with healthy relationship between work, the worker and the work environment, in other words, man-machine and environment. For example, when designing furniture, the anthropometric measurements i.e. physical body dimensions need to be kept in mind to ensure workers easy movement within the space, and work accessibility and minimize stress, strain and fatigue. The indoor environment should be safe and comfortable in terms of temperature, sound, lighting and should be both general and task specific.

There are basically three elements of Ergonomics. The first one is work and work environment, second being Anthropometry and Bio-mechanics and third being Human Factors and Human Engineering.

*Ergonomics is the science of the relationship between man and machinery and the equipment human beings use and the working environment. Having something that is called ergonomic means that the item has been designed to maximise productivity by minimising effort and discomfort.*

Generally ergonomic furniture is contemporary or modern in style. However, many traditional and heirloom furniture pieces were made keeping ergonomic principles in mind. While designing spaces, may it be a home or an office, the first thing to be considered is what will this space be utilised for. Ergonomics concerns itself with both utility and functionality. It helps us to make the best possible use of available space while having an aesthetic and well styled and laid out space.

Thus, an interior designer may take up designing 'projects' which may be a new building or an existing structure that is undergoing renovation or expansion of space under FSI (Floor Space Index) for residential or commercial space projects like — corporate offices, retail offices, malls,

food joints, public building like airports, banks, auditoriums etc. It may be noted that designing each type of commercial project is a specialty and the list is endless. Some designers may take up both types of projects. As a professional s/he contributes to benefit society by focussing on making optimum use of space which is aesthetically appealing.

## BASIC CONCEPTS

A clean attractive and comfortable space prove to be functional, useful and satisfying to the user. Workspace design is meaningful if the needs of the workers are kept in mind. A functional design of workspace requires the anthropometric dimensions of the worker and it is of great concern in effective management of work.

The major objective of designing space is to achieve functionality and to create the right kind of atmosphere while keeping costs low, within the budget specified by the client. In order to be able to achieve this, the interior designer needs to do the following:

- The first step in designing space is to interact with the client(s), know their lifestyle, requirements/needs/purpose, tastes, tentative budget, and area of the built space, also called *Client Project Profile*. While designing work areas the focus should be on human beings, their behaviour and their performance capabilities.
- Next, the designer has to obtain the blue-print of the to be built space or take physical measurements of an existing site, giving the details of dimensions of the rooms, their orientation and locations, location of doors and windows, and direction of opening, locations of columns and beams, internal or external (load bearing) walls as specified by the builder. This will help the designer in preparing a layout plan of the site (keeping in mind the client's requirements) by allocation of space for different tasks, modifications of internal walls, doors and windows, placement of furniture depending on the purpose of the space/room, type of flooring pattern etc. S/he may prepare 3-4 different layout plans, after the meeting with the client (which may spread over a couple of meetings and involve a lot of discussions from both sides). Ultimately one layout plan is finalised, the elevations, and 2D-3D views are prepared. The interior designer should be creative, have good drafting and communication skills.
- Based on the chosen/finalised layout plan, the *Estimated budget* for the entire project is prepared, including the cost of materials, labour cost, transportation cost, etc. along with the fees charged by the Interior Designer. This also includes terms and conditions for the payment/phase wise, alongwith the time schedule for completion of



the project/site. Labour cost includes the cost of utilising services of various craftsmen such as carpenters, painters, tile layers, artists, persons with technical skills such as civil work and masonry, electricians etc. In this process, the designer has to help the client select the appropriate and cost-effective materials for various items including tiles, paint, furniture and design of furniture, polishes, special effects, false ceilings, light fixtures, taps, door and window fixtures.

- Once the client approves the budget, a '*working drawing*', i.e., details with specifications of dimensions are prepared to enable the craftsmen in creating the space the way it was perceived by the designer and liked by the client. The designer generally guides the client in making a wise decision on the basis of the knowledge and expertise within the cost estimated for the project, for selection of materials, design, colours, etc. Once the material is approved, order for the same can be placed and the item can be delivered at site after full or partial payment.
- Interior Designers need to keep accounts of all transactions of money made between the client and him/her, between the designer and craftsmen, supplier, transports cost etc. Once the project work is complete the bill needs to be made and given to the client. Hence knowledge of accounting is very useful.
- Interior designers now-a-days use computers and software for this work to help the client actually 'see' the 'finished' work. In big projects, a creative director or a product development team of designers create detailed designs, using drawings, a structural model, computer simulations, etc.

Unlike many other careers, design inevitably requires both strong aptitude as well as creative talent. The challenge of this profession is each project is different. The success of the designers depend on their ability to give satisfaction to the clients by creating the interior much beyond their expectations and imagination. They need to possess certain skills — artistic, technical interpersonal and management skills besides using their imaginations and creative talent. They have to be self-motivated especially when a person independently practices as a designer.

It is necessary to be able to think out of the box. For the interior designer the greatest challenge is to create something different which is interesting, functional and attractive.

## PREPARING FOR A CAREER

Interior designing as a course has become popular in the last few years and a formal training in the technical course will enhance your knowledge. Some reputed institutions in India offer programmes in interior designing. The course offered may be at certificate or Post-Graduate Degree/Diploma level. The duration of courses and fee structure vary from one institution to another.

The curriculum may consist of different modules/courses like:

- *Fundamentals of Interior Design* — which lays emphasis on understanding principles and elements of art and design, their application in interior designs to achieve balance and harmony by creating a new look for interior of the space.
- *Knowledge of Materials and Furnishing* — Designers should have knowledge about different materials and their characteristics e.g., size, shape, weight, color, cost, and ease of use, fit and safety of different materials according to the design.
- *Space Planning* — As a student of interior design the student explores the behaviour of people in the interior space and how the internal environment influences the emotional and physical health and well-being of the occupants. The planning of layout is done by keeping in mind the requirements of the user group, nature of work to be performed, duration of tasks, space requirement based on anthropometric measurement (physical dimensions of human body) etc.
- *Knowledge of Different styles* — For those who are specialised in set design (for films/theatre/advertisements etc.) or hospitality design, s/he needs to have some knowledge and skills to recreate the historical and contemporary style depending on the theme of the set or restaurants or hotel design. As an Interior Designer, s/he often is required to do research to be aware of changing trends and styles.
- *Visualeffects* — The course gives an insight into different effects created while designing and planning of interiors. Computer applications for visual effects in interior designing by using Auto-CAD, 3-D Max, help the professional to give the client a 'walk through' effect.
- *Safety Rules* — Ensuring safety of the user/occupant is essential. The designer needs to adhere to rules and regulations applicable.
- *Lighting* — As a professional designer you must have understanding of the impact of natural and artificial lighting in interiors, as well as factors affecting selection of light fixtures. A good designer will have a plan for the electrical layout with details/specifications and ideal

placement to create the desired ambience. A poorly placed source of light tends to create poor visual environment, feeling of disinterest and dullness, thus resulting in poor work productivity. Lighting planners also create special effects depending on the design needs.

- *Design* — Knowledge of design techniques, tools, and principles involved in production of precision technical plans, blueprints, drawings, and models is a must.
- *Building and Construction* — Knowledge of materials, methods, and the tools involved in the construction or repair of houses, buildings, or other structures.

## SCOPE

There are an amazing number of different areas of ID that you can enter into and become an expert over the years. The greatest advantage in this profession is that you can try something new every time throughout your career. Some career avenues are:

Career Avenue	Focus of Work
Residential Interior Designer	Flats, bungalows, villas
Furniture Designer	Designing of only furniture items
Showroom Designer	Specialising in showrooms of various kinds e.g., interior materials, furnishings, or modular furniture or kitchen, etc.
Fabric and Textile Specialist	Expert having knowledge of fabrics and helping in choosing the fabric, selecting different types of drapes, etc.
Kitchen and Bath Designer	Specialising only in Kitchen and/or Bathroom designing and implementation
Auto CAD Technician/ Design illustrator	Drawing the plan layout, elevations, views and working drawing details using different software
Draughts person	A person who draws the details of plan manual with details

Furniture Company Representative	Involved in Sales and Marketing
Commercial Interior Designer	Super specialisation in design of banks, malls, etc.
Hospitality Designer	Specifically undertaking restaurant, hotel, etc. jobs
Healthcare Designer	Designer involved in designing hospitals, health spa, gymkhana, etc.
Education and Institutional Designer	Designer in teaching profession
Lighting Designer	Only undertaking lighting work



***AutoCAD drawing of living room***



***Actual room after completion***



***AutoCAD drawing of kitchen***



***Actual kitchen after completion***



*AutoCAD drawing of master bedroom*



*Actual bedroom after completion*

## LANDSCAPE DESIGN

### INTRODUCTION

In crowded cities, the sight of greenery, trees and flowers refreshes us and enlivens our spirit. Any place looks beautiful when there is greenery in the environment. Landscape design combines nature with culture through first systematically examining and assessing the prevailing conditions and topography of a specific place from a number of perspectives — social, ecological, geographical, geological and then develop a design to produce a specific outcome as desired by the client(s).

### SIGNIFICANCE OF LANDSCAPE DESIGN PROFESSION

If you become a Landscape Designer your main focus will be on designing external spaces which may be around buildings, or landscaping open public spaces. Essentially your responsibility will be to plan design and manage open spaces including both natural and built environment. Landscape designers work to provide innovative and aesthetically pleasing environment for people to enjoy, while ensuring that changes to the natural environment (whenever and wherever necessary) are appropriate, sensitive and sustainable.



## BASIC CONCEPTS

The most valuable contribution made by the landscape designer in any project is to generate ideas for landscaping to enhance the aesthetics of open spaces, small or large, with technical understanding and creativity.

The work covers diverse projects — both in urban and rural areas, ranging from designing the layout of parks, gardens and housing estates, to city-centre designs to improve land affected by mining or motorway construction. Many architects undertake landscape design. Thus, landscape designers can work on a variety of projects such as landscaping traffic islands in cities, open spaces in compounds of bungalows, villas, hotels, housing complexes and even open areas around office buildings, hospitals, shopping complexes/malls, public parks, college and university campuses, public spaces such as airports, railway stations, auditoriums. In many cases, degraded landscapes such as landfills and mines have been reclaimed and aesthetically converted into pleasant, beautiful sites. One of the important concerns is to prevent environmental degradation and integrate ecological sustainability. Just as an interior designer makes drawings for utilisation of a given interior space, the landscape designer also draws up a master plan (which requires creativity and imagination), with detailed drawings and technical specifications. A landscape designer collaborates closely with landscape contractors, as well as other professionals, especially architects, planners, environmentalists and people working in surveying and engineering functions. While doing this the landscape designer needs to take into account several factors like type of climate, microclimates, topography and orientation, site drainage and groundwater recharge, soil quality, to support the green plantation as well as human behaviour in the given space.

In many gardens floral designs are created, for example, the Mughal Gardens in Rashtrapati Bhavan and in Kashmir. Some landscape designers have designed around a specific theme such as the Musical garden in Mysore, the Garden of Five Senses in Delhi which houses different plants which can stimulate the five senses, Butterfly Park in Bangalore, Idgah Hills in Bhopal, the Hanging Gardens in Mumbai where plants are trimmed and given shapes of various animals. Some landscape designers work with water bodies, metal scrap, waste materials, to name a few. An example is the Rock Garden in Chandigarh. For this, the landscape makes use of various other materials besides plants such as sculptures, pottery, metal work, bamboo work.



Other areas where landscape designers have made significant contributions are:

- Stormwater and waste water management including recycling industrial waste water for greening/re-greening efforts, groundwater recharge, and treatment of wetlands such as mangroves
- Botanical gardens, arboretums, and nature preserves
- Recreation facilities like playgrounds, golf courses, theme parks and sports facilities
- Highways, transportation structures, bridges
- Waterfronts, pedestrian areas and pavements, parking lots
- Natural parks, tourist destinations, recreating historical landscapes
- Historic garden appraisal and conservation studies
- Reservoirs, dams, power stations or major industrial projects
- Environmental assessment and landscape assessment, planning advice and land management proposals
- Coastal and offshore developments
- Ecological Design that minimises environmentally destructive impacts by integrating itself with natural processes and sustainability.
- conducting preliminary studies of sites with focus on contours, soil, ecology, buildings, roads
- Assessing potential of various sites in terms of suitability to meet client's purpose specifications
- Carrying out environmental impact assessments.

A landscape designer must take into account and consider the present state of the land. It is necessary to consider the following box:

#### **Factors to be Considered for Landscaping**

- Catalogue the existing plants in terms of their water and sun needs, as well as wind exposure.
- Consider and record the microclimates i.e. small zones of temperature, light, water conditions, soil acidity or species habitation created by existing plants.
- Take soil samples, check their pH levels, composition, texture, moisture retention and fertility.
- Identify any dying plants, plants with symptoms of over- or under-watering, pest damage, inappropriate light, etc.

- Determine whether there is any soil erosion and try to develop a landscape design that will prevent this erosion.
- If there are pests, the landscape designer must try to eliminate them while minimising use of toxic substances.
- Seek ways to preserve the quality of water and try to incorporate ways of optimal utilisation of water.
- Seek ways to conserve natural resources and promote biodiversity.

Source: <http://ecolandscaping.org>

There are several advantages in considering the 'green' concept while landscaping, as shown in the box.

A wise landscape designer will try to incorporate ways to be environment friendly and ensure sustainability of the landscape environment for several reasons:

☀ Converting organic waste into compost will reduce expenses on fertiliser (GO ORGANIC) and pesticide/other chemical residues.

☺ Having plenty of trees provides shade, reduces the temperature, improves quality of air and soil, contributes to enhancing ground water level. and Fruit trees will also give fruits.



**Rock Garden—Chandigarh Sculptures  
(made from broken bangles)**



**Landscaping of a traffic junction in  
Mumbai city**



***Landscape Design — Mughal Gardens, Shalimar***

A person who desires to become a landscape designer should note that any of the above are opportunities for future employment. Job related titles are—Landscape gardener, landscape manager, landscape scientist, landscape decorator.

## PREPARING FOR A CAREER

In order to be a professional in this field the individual needs to acquire knowledge and skills one needs to join a profession which varies from a Certificate to a Masters degree, the duration of the courses opted for has a great impact on the knowledge and skills acquired. As a landscape designer, a multi-disciplinary approach is required to create the layout and design. S/he should have knowledge of botany, horticulture, fine arts, topography, land forms, geology, earth science, environmental psychology, ecology and biodiversity. S/he will have to interact with town planners and civil infrastructure designers to be able to develop the landscape design. Specific areas that the professional must be trained in are:

- *Design* — Knowledge of design techniques, tools, and principles involved in production of precision technical plans, blueprints, drawings and models.
- Knowledge of Ergonomics and its applications
- *Building and Construction* — Knowledge of materials, methods, and the tools involved in the construction or repair of houses, buildings, or other structures.
- *Installation* — Installing equipment, machines, wiring or programmes to meet specifications.

- *Fine Arts* — Knowledge of the theory and techniques required to compose, produce, and perform works of visual arts, drama, and sculpture.

Further, regardless of whether a person is an interior designer or a landscape designer, s/he must acquire a number of soft skills that include English language, customer and personal service. It also helps to have knowledge of business and management principles, strategic planning, resource allocation, human resources modeling, leadership techniques, production methods, coordination of people and resources as well as knowledge of principles and methods for showing, promoting, and selling products or services. Knowledge of computers and keeping updated with development of software programmes for either interior design or landscape design would be an advantage.

Some of the subjects offered under the Landscape Designing course are —

- landscape architecture
- garden design
- landscape design and ecology
- landscape planning
- landscape management.

Subjects such as geography, art, graphic design, environmental science, botany and biology provide a good foundation for landscape design. Some course providers ask for evidence of drawing skills at the time of application and often look for enthusiasm, practical skills and a creative outlook. Universities will take into account any qualifications you have obtained or relevant work experience, particularly if you are applying as a mature student.

In order to prepare for this profession one needs to identify institutions offering courses in Interior Design or Landscape Design. The eligibility is different for each level. There are several levels of courses in the area of Interior Design such as M.Sc. Resource Management and Design Application, Masters' Degree in Interior Design, Master of Interior Architecture B.Sc. (Interior Design), Professional Diploma in Furniture and Interior Design, Foundation Diploma in Design and Certificates Courses

#### ACTIVITY 1

Students can locate at least two institutes which offer the Design Course, eligibility, selection criteria and duration at local/ National or International Level.

which prepare you for designing of Interiors. Similarly different levels of courses are available for specialisation in Landscape design ranging from certificate, diplomas to degrees including B.Arch in Environmental Architecture, M.Arch. in Environmental Architecture. These courses are offered by Universities, Polytechnics, Technical boards, and Private Institutes.

### KEY TERMS

Layout, planning, technical drawing, landscape, working drawing, interior design

### REVIEW QUESTIONS

1. What is the Role of Interior Designers and Landscape Designers in shaping society?
2. Discuss in detail the abilities of designers.
3. Explain the different kinds of skill and knowledge required to be a professional interior designer.
4. What are the different types of skills an interior designer needs to have to be a good professional.
5. What is the significant role played by Landscape Designer in planning exterior spaces.
6. Discuss the activities carried out by landscape designers as professionals?
7. What is the scope for interior designers and landscape designers?