

Electronic lecture note

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DEPARTMENT OF HORTICULTURE

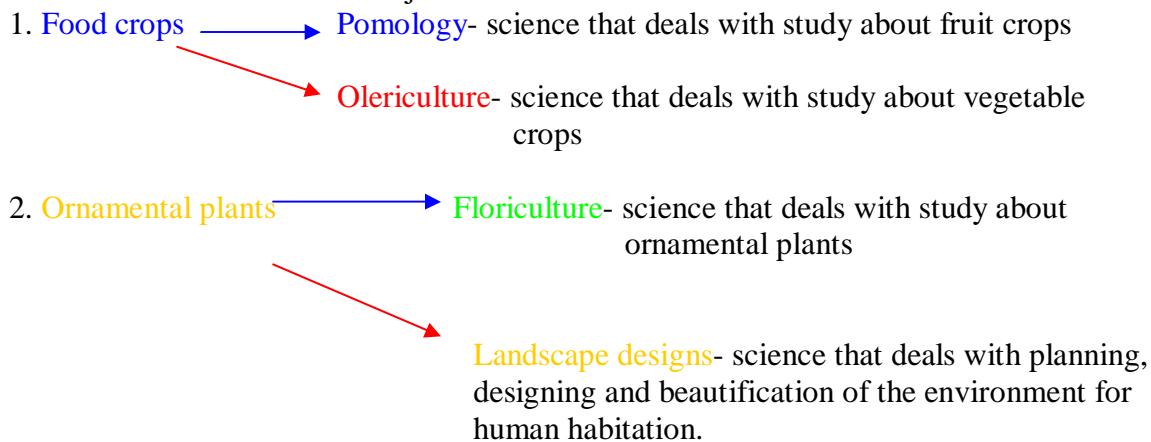
UNIVERSITY OF AGRICULTURE ABEOKUTA, NIGERIA

HRT 202 - Introduction to landscaping (2 units)

A. Horticulture- science that deals with cultivation of garden crops

Horticulture is derived from two greek words “Hortus: and “colere”. Hortus means garden, colere means to cultivate.

Horticulture deals with two major divisions:



B. COURSE OUTLINE

Definition:- Natural versus man made landscape. Scope and historical sketches of landscaping.

Needs for landscaping: to enhance property beauty and value; to provide screening effect etc. Types of landscaping: Institutional, private property, industrial, parks and recreational area landscaping. Elements of landscaping: colour, texture, form, etc. Principles of landscape design, selection criteria for plants and pavings. Review of soft and hard landscaping.

Practical: Identification of tropical and subtropical ornamental plants. Visit to places of interest, Plan reading and translation.

C. Introduction:

Landscaping: The art and science of developing the outdoor environment using soft landscaping, e.g. ornamental plants, and hardscapes e.g. non-plant objects, components to serve the needs and desires of people. It serves both the aesthetic and functional purposes. The outdoor surroundings could be designed with natural or man-made

components/materials/objects i.e it could be natural or artificial. Landscaping involves design, construction and maintenance of landscapes.

Landscape design/Garden design: Science and art of organizing and enriching outdoor space through the placement of plants and structures in agreeable and useful relationship with natural environment.

It involves the qualitative and functional arrangement and spacing of plants and non-plants garden features on a parcel of land set aside in the planning process that gives an overall pleasing effect.

Design essentially entails manner in which objects are artificially arranged in order to attain a particular objective, usually may be not always, a functional and a visibly pleasing arrangement.

Landscape design is more than just a cosmetic treatment to be applied to indifferent or insensitive architectural or engineering in order to soften the harsh edges or disguise an awkward layout.

It is to integrate structures in to the environment by reducing the visual intrusiveness, by repairing damage to the existing vegetation and more positively by providing a setting that is attractive and welcoming.

Landscape: Layout/arrangement of ground or land in scenery. It could be natural or artificial (man-made)

D. Natural versus man-made (artificial) landscaping

Natural landscape: A landscape that is unaffected by human activities. It may contain components that are living or non-living or both. Natural landscape remains intact if the living and non-living of the natural environment are free to move and change. Today no place on earth is unaffected by human activities. Thus landscape tends to vary in their degree of naturalness. Therefore, classification have been made into four types:

- a **natural** landscape is one that is unaffected by human activity
- a **sub-natural** landscape is one where if human activity was removed it would go back to a normal state
- a **semi-natural** landscape is one that has been drastically modified by human activity but has some natural elements left intact
- an **agricultural** landscape is one that has been totally altered and arranged by human activity - very little if any naturalness is left

Examples of natural landscape in Nigeria are; natural surrounding such as forest or desert, rocks (Olumo rock, Zuma rock), Erin Ijesa water falls, Ikogosi warm/cold spring, plateau in Jos, Mambila etc.

Artificial Landscape: The use of artificially made plants (synthetic or otherwise) for landscaping of outdoor environment. Nowadays, it is common to see large quantities of artificial plants (trees, palms, lawns) being used for landscaping. Though, it will not and cannot replace the natural plants in their effects and functions on the landscape, but could also add to the beauty of the environment. It has the advantage of low maintenance in terms of watering, fertilizer application, mowing incase of lawns and turfs, trimming/pruning and so on. Other items in artificial designs include the use of art works, e.g. sculpture (UNAAB Olumo model), concrete benches and tables, water bodies such as water fountains, artificial springs, etc.

E. Scope and historical sketches of landscaping

Scope: Landscape by its very nature encompasses all other specialist sections of Amenity horticulture in one form or the other. It includes the design, construction, maintenance and management of landscape features. Knowledge of floriculture, landscape architecture, and engineering are usually important.

History: Landscaping is an important sector which has expanded and still expanding in recent years in Nigeria. Despite this development, it is by no means comparable to what is obtainable in the developed countries in terms of development, quality, patronage and boom experienced in the landscape horticulture industry.

People have designed garden throughout the recorded history. Thousands years ago in Egypt and Babylon, there were planted architectural structures. The roots of renaissance garden extend back to the tradition of antiquity, especially those of ancient Rome. To self conscious revival of the idea of Vitruvius and Pliny, there was added the influence of Islamic world and medieval theory and practice. The use of water and fountains and organization of garden in to geometric quarters were part of wider inheritance.

In Nigeria, from the time immemorial, people consciously or unconsciously add physiographic and environmental characteristics to the land around them either for aesthetic gratification and or environmental enrichment and protection.

Traditionally, people keep garden and trees around their buildings. Though, the experience of the colonial era did little to influence creation and preservation of beauty in the surroundings as it was in Francophone countries.

Nevertheless, the inception of colonialism changed the trends of events as concerted effort were made to formally landscape some public buildings, government reservation areas (GRAs), institutions of higher learning, and sport fields which marked the beginning of organized/formal landscaping in Nigeria. Missionaries (Christian) also established plants in churches and schools. Some individual copied this idea and planted some ornamental plants in their surroundings.

Nowadays, landscaping business is fashionable and there is influx of all sorts of people in to the profession, having seen it as an avenue to make quick money. There is generally,

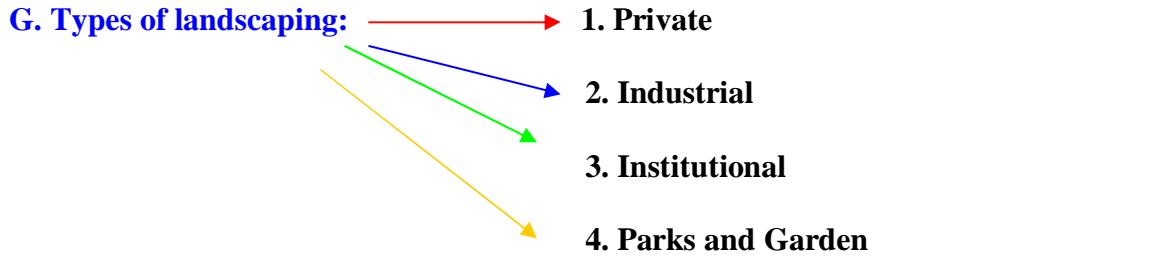
limited concern for landscape planning and management in Nigeria, most importantly from government with the exception of few state governments, who recently seem to brace up to the challenges of creating a beautiful and welcoming environment.

F. Reasons for landscaping:

Basically, if human beings had never altered the natural world, there would be no need for designers. Nature is such a perfect designer that left unchanged by human beings, the earth's beauty and natural system would never have required improvement. This idea is however not realistic in the modern world.

Therefore, some of the reasons why landscaping is important are;

1. Aesthetic/ Beautification of environment which is the primary purpose of landscaping
2. Engineering purpose: e.g. protection of structures against environmental hazards i.e. rain storms etc.
3. Architectural purpose: e.g. re-integration of structures into the natural environment
4. Biological purpose: e.g. improves the micro-climate (environment), absorbs dust, noise, pollutants and assist in air purification.
5. Ecological purpose: e.g. some ornamental plants can be used to solve ecological problems such as flooding, to control erosion and absorb chemicals from soil (oil spillage)
6. Economic purpose: e.g. creation of job opportunities, add value to property, creates wealth for plant growers and government (taxes, foreign exchange), beautiful environment also attract tourists and investors.
7. Social purpose: e.g. landscaped areas are useful as recreation and relaxation venues (parks), sporting arenas (polo, football fields), and symbols of affluence/wealth.
8. Nutritional/Medicinal purpose: e.g. some plants used primarily for landscaping could also be used for food (fruits and vegetables) and medicines, plants have therapeutic effect on patients etc.
9. Environmental control in prevention of hazards such as wind breaks, shade trees for guidance against sun glares, etc.
10. Urban forestry in the integration of forest resources into urban areas by town planners and foresters, provision of shelter belts, and fire woods, etc.



1. Private property/residential landscaping: Landscaping of personal residential properties like a flat, bungalow, duplex, estate etc. Usually, plants of different good qualities are used as much as possible for the enjoyment of owner(s). It is important to landscape to the taste of the clients even if expensive materials will be used.

Characteristics:

- a. There is no need for plant nursery- it is small in scope and very expensive to keep a personal nursery
- b. No green or glass houses is required
- c. There is only one garden for family members and their friends

2. Industrial landscaping: It involves the establishment of plants and hardscapes within the industrial estate/area e.g Agbara industrial estate, Nigeria Breweries Ltd, Portland/Lafage cement company, etc. Most areas are planted to grasses, trees and hedges along the walkways. It is not necessary to use exotic or expensive items compared to private property landscapes. When landscaping for factories/industrial centres, study kind of activities in each section e.g manufacturing area with many peoples, vehicles and materials-grassing the whole area dotted with spot planting will be appropriate. Near administrative block, use beautiful materials because it is the focus and should be at its best. Inside the offices; a number of indoor plants may be introduced.

Characteristics:

- a. There may be need to have a plant nursery within the industrial estate, particularly for big industrial estate.
- b. No green or glass house is required
- c. It has at least two gardens depending on the size

Though, hotels can also be regarded as industrial landscaping because it is not meant for a single family, but for the general public and for commercial purpose. However, in

actual execution of the project it treated like private property because of requirement for high taste.

3. Institutional landscaping: Landscaping that involves all sorts of institutions-universities, colleges, polytechnics, hospitals, research institutes, barracks etc. Usually it is meant for all categories of users, i.e. general public of all age category- children, adolescents, adults, women, men, students, lecturers, non-academic staff, scientist etc. Institutional landscaping must be different from others because it is not only for recreation, picnic but also for instructional purpose (educational)

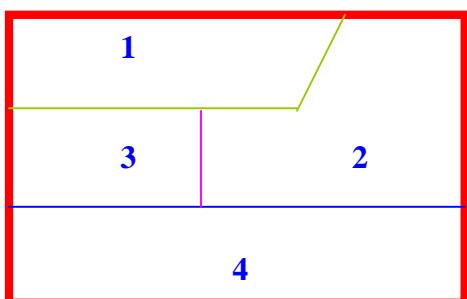
Characteristics:

- a. There should be a plant nursery, particularly for replacement of dead plants and to plant new areas.
- b. Presence of green and glass houses is also important
- c. There are many gardens and usually larger.

4. Recreational landscaping: It involves landscaping recreational arenas (polo ground, parks and gardens, football pitches, game villages etc) for adults and children. It has special inclusions such as restaurant, water fountains, focal plants, green lawns and other areas for social like picnic, marriages, honey moon, film shooting. Nowadays, ICT and photocopy centre have been added.

H. Use areas in Landscape designs

Using the ‘Indoor room concept’ to describe the Outdoor



- 1- Public area
- 2- General living room
- 3- Service area
- 4- Private living room

Walls- hedges, avenue trees,
Ceilings- shade trees, canopies, etc.
Floors- lawns, foundation plants, concrete floors and walk ways, roads with interlocking blocks or asphalt.

i.) Use areas

- 1. Public area –** usually the front part of the property accessibility to visitors
- 2. General living room –** an area of the home that joins the public area, service room and private room
- 3. Service area –** accessible to only the occupants

4. Private living room – an area for rest and occupies the rear of the property and not accessible to outsiders

ii.) Components of the outdoor room:

- a. Walls** - defines the limit and shapes of the out door room, direct traffic through the landscape (hedges, avenue trees), provides full or partial privacy (), provide security (thorny plants e.g. boungavalia spp.), etc.
- b. Ceilings** – defines the upper limit of the outdoor room, provide full or partial shade, provide privacy from overhead viewers, etc.
- c. Floors** – defines the base line of the outdoor room, absorbs shock or impact of traffic, e.g. turfs / lawn, paving, ground covers,

I. Site Survey and Analysis

The objects of survey refer to measurable quantities and qualities on the site. They fall into 3 primary areas:

- 1.) Collection of data- from 3 sources
 - i) site
 - ii) recorded data
 - iii) information from client, e.g. composition of the family, hobbies and special interests, and frequency and style of outdoor entertainment
- 2.) Site analysis or survey (see below)
- 3.) Visual characteristics of the site

Information from site analysis

- Take a dimension of the plot
- Look at the topography
- Rock formation
- Hydrography (surface and underground water)
- Existing vegetation
- Existing structure (if any)
- Location of facility
- Directional orientation
- Historical importance of site
- Proximity to roads
- Views towards and from the site
- Problem areas on the site
- Know the prevailing wind direction

These information can be summarized into natural factors, man made factors and cultural factors.

- After all these three, then presentation of information in form of drawings, diagrams, photographs, written documents, tree dimensional model.

-After the survey, then present the bill of quantities

-Analysis: consists of breaking down of all the available matter into components

Data collection

1. Maps- large or small scale maps, land capability maps, climatological maps,
2. Photographic survey- area oblique,
3. Recorded data- from geographical maps, town planners,
4. Restrictions from local government authorities- certificate of occupancy (C of O), set backs on lands, etc.
5. Road types- Trunk A, B or C roads, desire lines, etc.

Site survey- Use

- Triangulation methods- measurements
- Visual survey- visual observations
- Ecological survey- involves all flora and fauna available in the site, use quadrants or a square for ecological studies and frequency of occurrence.
- Soil Survey- engineering qualities of the site, soil type, soil fertility, soil depth, etc.

Presentation of Information

Present your information using

1. Location plan-
2. Base plan- working plan for information gathering and records purposes.
3. Topography- hilly, sloppy, level lands, etc.
4. Geology and soil types
5. Services- utility lines, above or underground cables and pipes, etc.
6. Access and circulation- roads, water bodies, etc.
7. Micro-climate, vegetation, bare or covered.
8. Ecology- flora and fauna, dominant, co-dominant or recessive species
9. Visual characters, bad views, good views, etc.
10. Written reports

J. Elements of landscaping:

Visual art such as painting, sculpture, architecture etc are derived from line, form, texture and space. The elements when combined could be used in a variety of ways to influence the artist's vision. In landscape design, as with other forms of visual arts, these elements are the foundation of good design.

1. Line: lines can be horizontal, vertical, diagonal or curved. It is how they are used individually or in combination that gives a landscape dimension. Lines can appear graceful or crude, bold or delicate. Examples of line usage in landscape include

-Accentuating an object or drawing attention to a focal point e.g making a large space seem smaller and vice versa, using a walkway with direct route to the focal point will naturally draw a person physically and visually in that area.

-Altering viewers' perspective: a walkway that meanders, where a focal plant is not always in view, will create a mood of surprise, privacy or even suspense.

2. Form: Form is associated with three dimensional objects, while shape refers to two dimensional objects. Both are made from lines, but the way these lines are arranged determines the shape or form. When plants with rounded form are planted in a pattern that follow the curve, the landscape takes on a flowing and natural feel. In contrast, if the bedlines are linear and geometric in layout, the plants with columnar forms and tight, upright branching are planted along those bedlines, the landscapes takes on a rigid and formal feel.

3. Colour: Colour is perhaps the most complex art element, and it tends to be the most used element. Based on the Munsell system, colour has three dimensions; hue, value and chroma.

a. Hue: It is the name of colour e.g red or blue. Although the total number of hues varies by colour system, it is usually 10-12 basic hues. Hues are also categorised according to designation; cool (blues, greens, purples) and warm (reds, yellow and oranges). This distinction is important to landscape designers, as warm hues tend to look closer to viewer, while cool hues tend to appear farther from the viewer. Designer can apply this to either decrease or increase the perceived dimensions of space within a landscape. Hue can also be grouped as analogous or complimentary.

b. Value: value describes how dark or light a colour is and it sometimes called brightness, lightness, or luminosity. Hues that are light have a high value than hues that have black addition.

c. Chroma: It is sometimes called intensity, saturation, or purity. It is a measure of actual hue content. Pure hues have the most chroma, while grays have the least chroma

Colour is an important landscape design consideration for both plants and hardscapes.

4. Texture: It is the surface characteristics that is seen or felt. Texture can be categorized into coarse, medium and fine. All landscape components have their own textures. Contrasting textures add interest to a design, but much textural contrast can result in a chaotic scene.

5. Space: In designing landscape space, it is important to differentiate between positive (occupied or filled space) and negative (unoccupied or empty space). Space can be two or three dimensional as a shape or a form respectively. It is important to effectively use elements of space to help organize a landscape and provide focus to specific areas.

K. Principles of landscape design

The goal in developing a landscape plan is to design a plan that will achieve unity and harmony. The principles of landscape design are the building blocks used by designers to create beautiful and functional landscapes. Landscape design principles are the same for all types of landscapes. They are in many different ways, depending on the site, the clients' wishes, and designer's knowledge and preferences. Similar to elements of art, these principles represent the primary concert that influence landscape design. Design principles are not rules that require precise adherence, but instead reflect a framework of universal concepts that prove effective in creating designs.

Therefore the following principles should be considered in designing the plan;

1. Simplicity: Regardless of the scale of a landscape, simplicity should be an overriding design consideration. This is obtained by repeating the plantings. A few well-arranged forms, colours or textures should be used. Too many different things in a small area produces a restless quality which will leave the onlooker dissatisfied. Simplicity in a landscape can be created both physically and visually. Physical simplicity refers to a design in which the actual shapes are simple e.g house dominate a residential landscape design, use simple bold rectilinear lines that mimic the house or a strong audacious curves rather than thin, wiggly bedlines that resemble snake lying in the grass. Visual simplicity can be achieved when plants are grouped or massed together.

2. Order: Order can be achieved by using consistent design theme such as formal, informal or structured informality. Grouping plants and hardscapes so that there are physical connections between the elements will enhance order and create a cohesive whole. Order can be further reinforced by grouping plants together in masses, rather than scattering individual plants around the landscape.

3. Repetition: There is need for reappearance of attractive materials in several locations in the landscape. It results in a sense of unity between the different plant species that make up the design. Too much repetition leads to boredom while too little leads to visual choas. Repeat one or more basic art element (form, colour, texture, size) e.g planting of red flowers at all entrances to the house.

4. Rhythm and line: It addresses the factors of time and movement within a landscape. Landscapes are seldom experienced in an instant, but rather through time as a person explores the space. Rhythm in a landscape may be visual or physical, and it can be observed in both vertical or horizontal planes of a design. For example, vertical visual rhythm is gradual progression of plants from short to tall. Horizontal visual rhythm is often generated for bedlines or hardscapes. How a person moves through the landscape and physically interacts with it can be determined, in part, by the design rhythm e.g pathway width and route, dimensions, spacing of interlocking blocks, location of seating or resting elements.

5. Unity: It is the principle that creates link between the plants, hardscapes and house. It creates a sense of interconnectedness within the design composition. A successful landscape design ties the house and landscape together and creates an outdoor living space that is an extension of the house. Unity can be reinforced by using consistent bedlines, single ground cover, massing plants together and repeating these masses throughout the landscape.

6. Balance: The design should include a focal point or centre of interest around which the landscape plants, structures, and open spaces are grouped or balanced. The arrangement of plants and other objects should be in a sequence leading to or away from a focal point. The front entrance of the home is usually the focal point. A sense of balance is created by designing a real or imaginary point and by using mass, colour, line or texture in equal quantities on each side of the point. The types of balance in landscapes are symmetrical, asymmetrical and radial. Symmetrical is common in formal landscapes. This landscape has an obvious central axis, and everything on one side of the axis is mirrored on the other side. Asymmetrical balance combines different objects on each side of a discrete axis or balance point, resulting in a similar visual mass on both sides of the axis or point. The bed lines in asymmetrical design tends to be curvilinear, and the overall feel tends to be informal than a symmetrically balance design. Radial balance is created by equally spacing objects around a centre point, creating a strong focus in the middle of the pattern. It can be used effectively in patios and paved areas or in large areas that integrate plantings and hardscapes.

7. Proportion and scale: refers to size relationship between the different components within the landscape. It could be relative or absolute. Relative scale is the relation of one part of the design to the others. The house is often the dominant element of a residential design, and it requires that at least some elements of the design be sufficiently sized, e.g. height of building may influence size of plants. Absolute scale is the relation of a particular design element to human. Plant materials help to define size relationship within a landscape. The major relationship that involve plant materials are; plants to buildings, plants to other plants and plants to people. Because plants are living and dynamic entities, these proportional relationships will change as the landscape mature and even season to season if the plants are deciduous or herbaceous. To attain correct proportion, the landscape design should be based on mature height and spread of the plant.

8. Emphasis: focal points draw the eye to specific landscape locations when a person is viewing the landscape as a whole. Emphasis on specific areas and create a contrast between memorable, vivid or exciting landscape elements and the rest of the landscape. A focal point may be a specimen plant, garden accessory or water feature. It captures attention by its unusual line, shape, texture or colour. Each major area in a landscape should have one focal point, multiple points are acceptable if the area is large.

Basic Styles in landscaping

1. Corner planting- incurves, outcurves,
2. Line planting
3. Foundation planting

L. Selection criteria for plants:

1. Ability to fill the role assigned it in the design
2. Ability to survive the growing conditions of the site
3. Availability and affordability by clients
4. Plant size at maturity
5. Flowering qualities
6. Foliage and tree back colour
7. Presence or absence of thorns
8. Plant rate of growth and length of life
9. Deciduous or evergreen
10. Susceptibility to pests and diseases
11. Frequency of pruning required
12. Soil preference etc

Selection criteria for paving:

1. Ability to fill the role assigned it in the design
2. Availability and affordability by clients
3. Durability
4. Maintenance requirements

M. Review of soft and hard landscaping.

Soft landscaping: refers to the plant component of landscaping. It entails the use of plants of all categories (palms, trees, shrubs, grasses, herbaceous plants etc) that are natural in a landscape. The plantings of especially indigenous plant species ensure integration of structures in to the natural environment thus appearing natural in nature, among other many uses of plants in our surroundings. Both soft and hard components are employed to realize a beautiful and functional landscape.

Hard landscaping: The use of any non-plant materials in the development of a landscape. Examples include walkways, driveways, patio, decks, walls, ponds, fences, pergolas, steps, landscape lightings, water fountains, furniture, containers for potted plants etc. These features, individually and in combination, make up the ground, vertical, and overhead planes within a landscape and define outdoor living spaces. Hardscapes should be used to compliment the plants component to meet a client's need.