

ARCH 121 – INTRODUCTION TO ARCHITECTURE I

LECTURE NOTES:

WEEK 1 - Introduction: Definition of Architecture and the Architect:

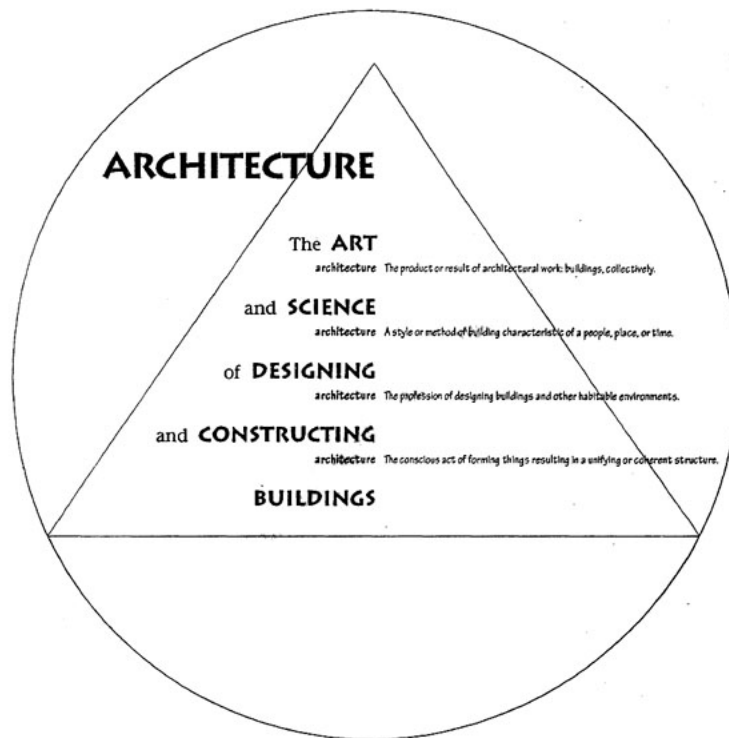
1. Definition of Architecture

Architecture could be basically defined as ‘the art and science of designing and constructing buildings’. As a word, ‘architecture’ can carry several other meanings, such as:

1. The product or result of architectural work: buildings, urban areas and landscapes.
2. A style or method of building characteristic of a people, place or time.
3. The profession of designing buildings and other habitable environments by architects.
4. The conscious act of forming things resulting in a unifying or coherent structure.¹

In its most simple form, architecture is the design and organization of spaces, and in its most common form, it is the design of buildings, their interiors and surrounding spaces.

The architect acts a designer, who can work in a wide range of scales, from a scale as large as the planning of a city, up to a scale as small as the design of a chair.



Ching, F., Visual Dictionary of Architecture

2. Etymology of the Word ‘Architecture’

Etymologically (in terms of the root of the word), the word ‘architecture’ comes from the Greek *arkhitekton* ([ἀρχιτέκτων](#)), which is a combination of the word *arkhi*, meaning “chief” or “master”, and *tekton*, meaning “mason” or “builder”. In line with the etymology, architecture

¹ Ching, F., Visual Dictionary of Architecture

used to denote both the *process* and the *product* of designing and constructing buildings; and the architect used to be known as the “master mason” or “master builder” in the past.

3. Origin of Architecture

Architecture is one of the oldest professions in human history. It appeared with human being’s need of shelter to protect himself from the weather and danger outside. It first evolved as the outcome of needs (like shelter, security, worship etc.) and means (like the available building materials and skills). As human cultures progressed, building became a craft and later the formalized version of that craft, which is practiced by educated professionals, is called ‘architecture’.



The Great Cave of Niah, Malaysia (human remains dating to 40,000 years)



Primitive Maori shelter, New Zeland (Canterbury Museum) (left), Shelter of Chumash and Ohlone Indians, USA (Photo: Norm Kidder) (right)

4. Natural form, Man-made form, Architectural artifact

As the famous architect Louis Kahn says “architecture is what nature cannot make”. Indeed, human beings are one of the few animals that can build buildings. Structures that some animals

build, such as some birds', bees', or white ants' nests, indeed resemble our buildings in terms of their structural economy.² For example a certain bird in South America (Rufous-breasted Spinetail) builds a two room nest, with rooms tied to each other by a tube like structure. Or, white blind ants build structures out of mud on the ground. Or, the sea mollusk nautilus builds a shell around itself out of calcium carbonate. As it grows, this nautilus adds a new and bigger volume to its shell, and the small, emptied part of the shell is filled with nitrogen, which gives the shell the quality of floating in the water. These older parts of the shell are left as the record or the heritage of the animal's history.



Nest of Rufous-breasted Spinetail, South America (Photo: ProAves Colombia) (left), White ant nest, Africa (Photo: unknown) (right)



Nautilus shell

Similarly, architecture is the shell of the human species. It is the environment that we build for ourselves. However, unlike the animals, we as human beings “think” while we are making buildings. Our act of building our buildings is a conscious process. This is what differentiates man-made structures from animals' nests. Animals produce their nests or shells as a result of their genetic coding. We on the other hand, build our buildings consciously to meet some requirements and we not only meet those requirements but we give expression to some values and sensations, such as cultural values.

² Roth, L. Understanding Architecture



Parthenon in Ancient Greece made to honor the Greek goddess Athena (left), Taj Mahal in India made as a mausoleum to honor the Emperor Shah Cihan's wife Mumtaz Mahal (right)

As our experience and knowledge develops and as the cultural and environmental circumstances change, we change and evolve this architectural environment. But if we want to protect our identity, we should take optimum care in protecting the “shell” of our past. Because that “shell” (or architecture) of our past is the physical record of our lives, our successes and aspirations. It is the cultural heritage that is left to us.

As famous thinker John Ruskin said: “Great nations write their autobiographies in three manuscripts—the book of their deeds, the book of their words, and the book of their art. Not one of these can be understood unless we read the other two; but of the three, the only quite trustworthy one is the last.”

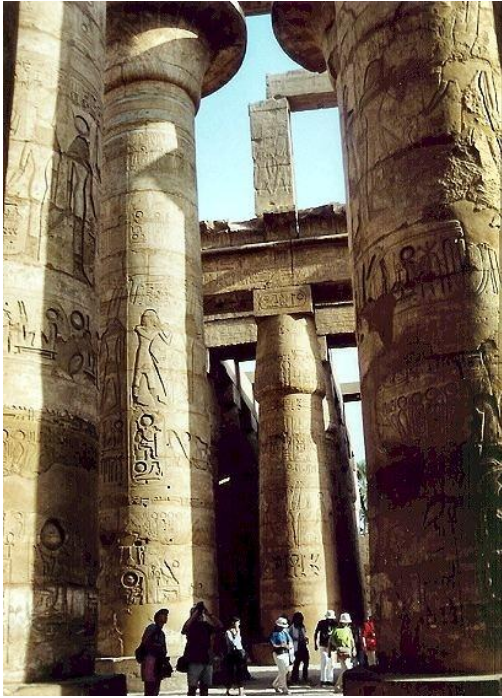
As rightly said, architecture is like the history and literature of one nation in built form. It is the record of the people who produced it and could be “read” as the history or literature of those people. It is a nonverbal way of communication and it is the quiet record of the people who produced it. We can understand a culture's history and literature from their architecture and likewise if we want to understand the architecture of any period or culture (in the past or today), we should understand the history and literature (deeds and the words) of that period. (p. 23)



Empire State building, New York (left), Big Donut shop in Los Angeles (right)

This way for example, Empire State building in New York (built in 1932, Shreve, Lam and Harmon associates) tells us about capitalism and the urban values of 20th century, and the Big Donut shop in Los Angeles (built in 1954, Henry J. Goodwin), even though it is a bad architectural example, tells us about the living style of American people, their car dominated life and desire for savory fast food.

Therefore, architecture is the art that we cannot avoid. We can avoid and not see other arts one way or another, such as painting or sculpture, but architecture, like it or not, affects us and shapes our behaviors all time, as we live in and around it. We have the feeling of awe when we are walking in the hypostyle hall of Karnak temple in Egypt, or under the dome of Suleymaniye Mosque in İstanbul, or when we see Frank Lloyd Wright's Falling Water House with all its beauty within the environment that surrounds it. Or more commonly, we are affected by the color of the room we are in.



Hypostyle hall of Karnak temple, Egypt (left), Suleymaniye mosque by Mimar Sinan, İstanbul (right)



Falling Water House, Pennsylvania, USA by Frank Lloyd Wright (left), A room painted green (right)

However architecture is not just art. Architecture deals with form and gives very much importance to how that form looks, but it also deals with function and how that function affects form. This is what differentiates the art works, such as sculpture, from architecture. Architects think also of other things such as function or structure, next to form, beauty and expression. Moreover, **art** does **not** have to be **beautiful**. Art expresses the sensations, feelings of the artist through the forms he/she chooses, with or without purpose or beauty. Architecture is not that free.



Fountain by Marcel Duchamp, 1917 (left); Weeping Woman with Handkerchief by Pablo Picasso, 1937 (right).

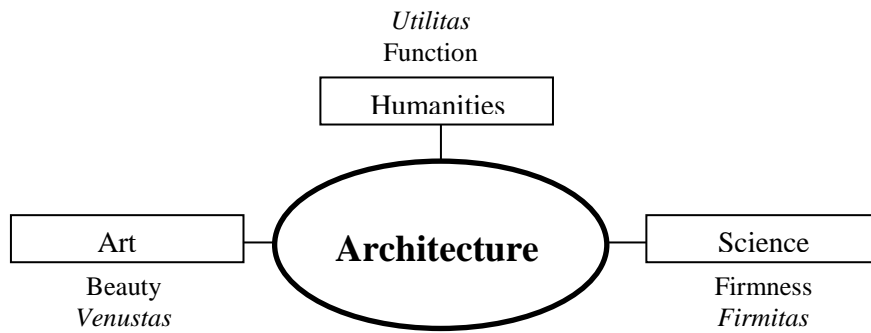
5. Fundamentals of Architecture

The earliest surviving written work on architecture is Roman architect Marcus Vitruvius' *De architectura* (Ten Books on Architecture), which was written in the early 1st century AD.

Vitruvius has written in his book that a good building must satisfy three main qualities, which are *firmitas*, *utilitas*, *venustas*. Referring to firmness, functionality, and beauty, Vitruvius denoted that a good building should be firm, useful, and beautiful and that the architect should strive to fulfill each of these three qualities as well as possible.

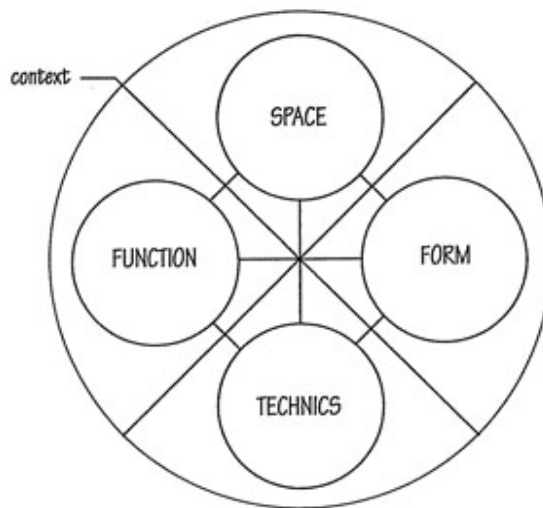
Since ancient times, these basic elements of architecture (firmness, functionality and beauty) have remained essentially unchanged. Accordingly, architectural products (or buildings) should still be firm, which means that they should stand up firm and solid, and remain in good condition; they should still be functional, which means that they should be useful and function well for the people using them; and they should still be beautiful, which means that they should please the senses of the people who view and use them.

Therefore, architecture should try to reach the optimum combination of *firmitas*, *venustas* and *utilitas*, meaning the firmness of structure, beauty of the form (and space), and the functionality of the building. For this reason the profession of architecture is in between the *arts*, the *science* and the *humanities*. Therefore, the architect should equip him/herself with the knowledge of many branches of study, such as aesthetics, building technology, sociology etc., to be able to produce architectural works that meet the needs of people properly.



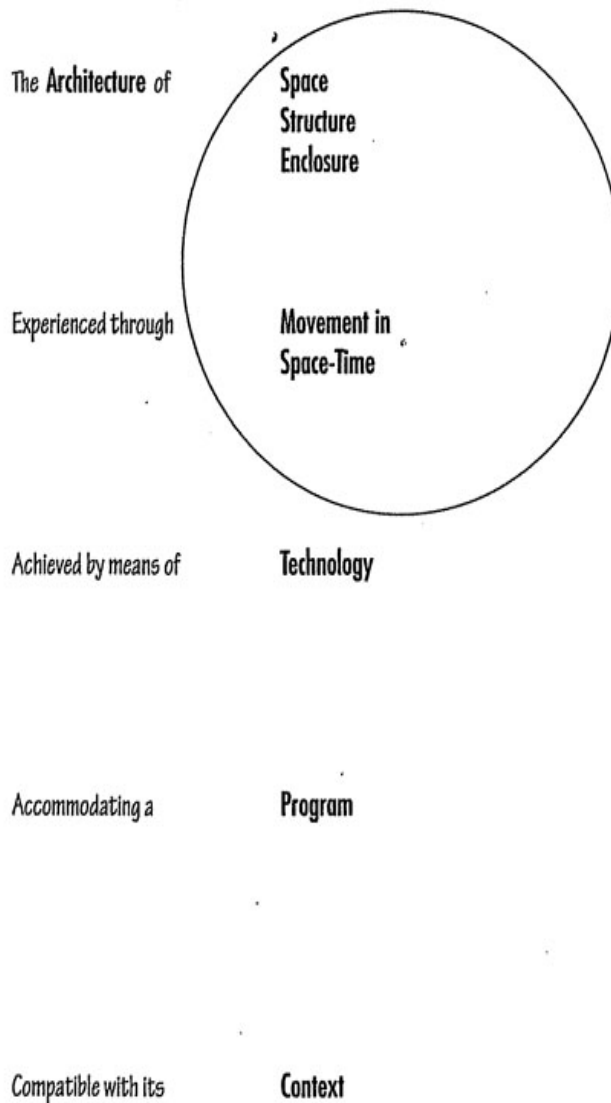
Therefore, the ultimate test of architecture is made with the following questions:

1. Is the building functional? (Could it be used effectively and easily?)
2. Is the building firm? (Is its structure firm enough to carry all the weights it should carry, such as its own weight, its users' weights, and the forces of the wind and the earthquake? And, Are its materials durable enough to withstand many years of use?)
3. Is the building beautiful? (Does the building give visual delight to the user and the viewer; is it aesthetic and pleasing?)



(Source: Ching, F., Architecture: Form, Space and Order)

Architectural Systems



(Source: Ching, F., Architecture: Form, Space and Order)

6. Scope of Architecture

As the etymology indicates, the architect has to act as the “master builder” and see the building both as an *object of design* and as a *process of building*. Therefore, he/she has to have a full command of both the form, function, and structure of the building, and also other factors such as the site characteristics, materials, lighting, heating and acoustic conditions, color and texture of buildings.

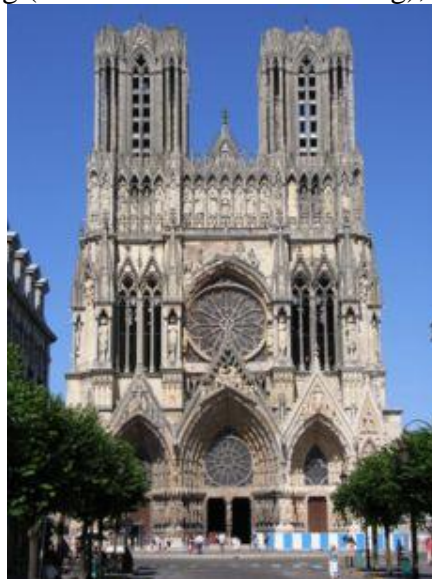
First of all, architecture takes place at a site or a context. The site of an architectural project affects and determines very important characteristics about the project, such as its layout, orientation, approach, views, relationship with the environment, and materials (as they would differentiate according to the climate).

Secondly, to be able to create comfortable environments for people, architecture takes care of the lighting, heating and acoustic conditions of the building, as well as the color of spaces and the texture of the materials. It considers how light affects and travels within the building, how the building is heated or ventilated, how it reacts to sounds (acoustics), what colors it should have, and the textural sensations evoked by the materials used in it. After all, a completed building is a sensory experience.³ (farelly, p. 8-11)

Besides these, architecture can also carry a symbolic function. It can have a symbolic content to be conveyed to its users or viewers. This symbolic content could be perceived easily in religious and governmental buildings. A courthouse for example could be made to be intimidating consciously, or a religious building could be built to create the feeling of awe. Moreover, architectural works could act as icons of cities, such as Eiffel Tower in Paris or Chrysler building in New York.



Reichstag (German Parliament Building), Germany



Reims Cathedral, Reims, France

³ Farelly, Mimarlığın Temelleri



Eiffel Tower in Paris (left) or Chrysler building in New York (right)

7. Architectural production and creativity

Architectural production is a process that includes the stages of thinking, designing and drafting. This process starts with the development of a “concept”. A concept is the initiating idea of the project and can be formed by way of considering several factors, such as the function and site conditions of the project, a possible structural system, or the historical and cultural context of the site.

This “concept” starts to take “form” by including the “functions” attached to it. Then, this “form” is further shaped “structurally” and “materially”. Finally, the form is realized in three dimensions by taking care of the sound related (acoustics), light related (illumination) and spatial considerations.

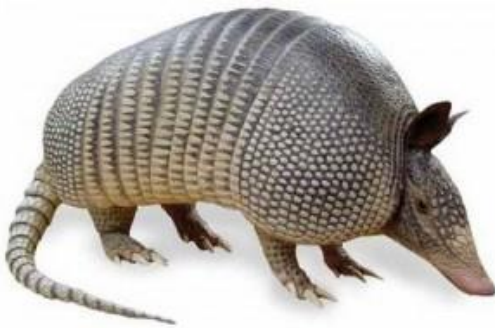
As other design disciplines, architecture is an act of problem solving that requires a creative thinking process. These problems need creativity because they do not have predetermined methods (as in mathematical formulas or theorems) for their solutions. Each designer/architect has to find their own methods themselves for each and every different design problem.

When a designer is given a design problem, his depth and range of design vocabulary affects both how he understands the problem and also how he shapes his answer. If one’s understanding of a design vocabulary is limited and the range of possible solutions to the problems are also limited.

The concepts and methods for different design problems can be formed by getting inspired from past architectural solutions and architects, by getting inspired from nature by analogy or metaphor, or most favorably by total innovation of new forms and structures. Architectural creativity exists when the architectural work is both original and appropriate.



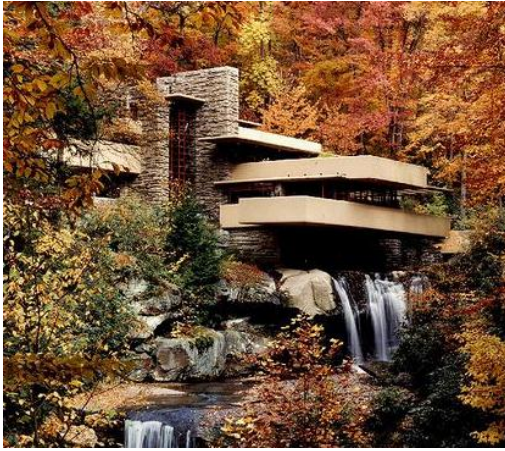
An example to inspiration to past forms: Pantheon, Rome, Italy (126 AD) (left), Jefferson Memorial, Washington DC, USA (1943)



An example to an analogy to nature: A picture of an armadillo (left), The SECC Conference Center in Glasgow, Scotland (by Foster and Partners in 1995-1997) (right)



Examples to creativity and originality in architecture: Villa Savoye Poissy by Le Corbusier, 1929-31(left), Farnsworth House by Mies van der Rohe, 1951 (right)



Examples to creativity and originality in architecture: Falling Water (Kauffman) House by Frank Lloyd Wright, USA (left), National Congress of Brazil by Oscar Niemeyer, Brasilia, 1958 (right)

8. Course Description and Objectives

As the “art of building”, architecture has its own language. In order to read and write in a language you should first know the letters, words and the grammar of that language. Same applies here. In order to learn architecture, you have to learn its letters, its vocabulary (or basic elements) and the grammar (composition principles) that brings them together. Once you learn these fundamental components, you can read and write anything in architecture.

The aim of this course is to introduce you with the elements and principles of architectural design in order to support you in your design studies. For this reason, this course will introduce you with the basic elements of form and space and show you how they are manipulated and organized in the development of a design concept.