

CIHAN UNIVERSITY/SULIMANIA, ARCHITECTURAL DEPT.

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FIRST SEMESTER LECTURE 5

# Logic and Design Methodology

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# What is Logic

- ▶ Logic comes from the word “**LOGOS**”, which means “**REASON**”. It is concerned with the methods and rules for correct thinking.
- ▶ Logic, as an **ART**, on one hand, direct reason. As an ART it guides man’s reason so that he can proceed with order and precision in the search for meaning.
- ▶ Logic as a **SCIENCE**, on the other hand, “investigates, discovers, expresses, systematizes, demonstrates, and explains the laws of correct thinking.



# History of Logic

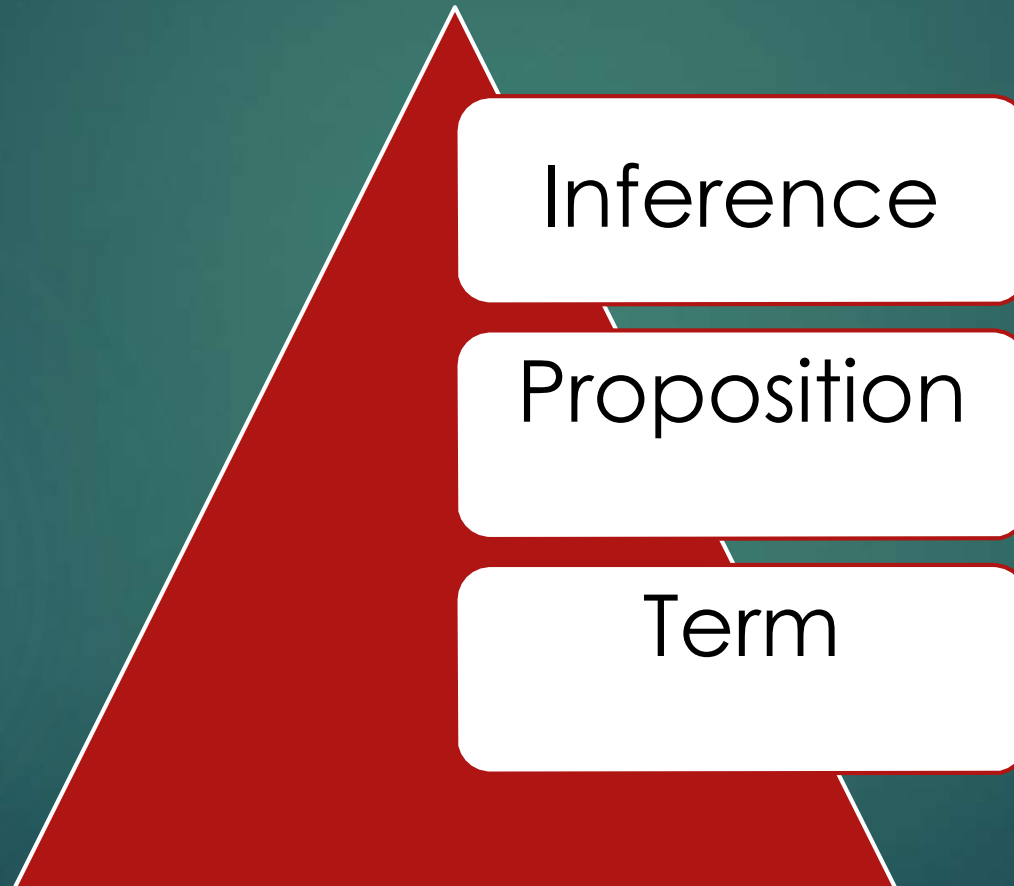
- ▶ According to Socrates, **Philosophy** started from a simple process called “**WONDERING**” The curious nature of the ancient people of Greece has helped them to initiate studies and researches to feed their doubting minds with philosophical ideas.
- ▶ **ARISTOTLE** Regarded as the Father of Logic. He became successful in separating logic from the totality of philosophy. His six books which were collectively known as **Organon** became the bible for



# Branches of logic

- ▶ **Formal logic**: concerned with the aspect of form which has something to do with the correctness or sequence or the following of rules, like into mathematics
- ▶ Ex. All men are mortal but Pedro is a man therefore Pedro is mortal
- ▶ **Informal logic** (material): concerned with the aspect of subject matter or content or truth of the argument
- ▶ Ex. Triangles have 3 sides, since ABC is a triangle so it has 3 sides

# Levels of expressions



# Term

- ▶ A term is a word that denotes a particular object. By denoting a term brings us an object or idea.
- ▶ **Types of TERM**
  - Simple and Complex
  - Significant and Non-Significant
  - Distributive and Collective

# Simple and Complex

- ▶ Simple – when the term used consists of a word, for instance “The Prophet” such is called a simple term.
- ▶ Complex – composed of many term but standing one idea.  
Example, The lady in red

# Significant and Non-Significant

- ▶ Significant – when a term is used to directly express a concept, it is called a significant term. Like when we said freedom
- ▶ Non-Significant – when it is not points directly to the nature of a thing. Ex. environment



# Distributive and Collective

- ▶ Distributive – a term is distributive when it shows the essence of entities singularity. Ex. Line
- ▶ Collective – a term is collective when it shows the essence of entities as a group. Ex. Human being

# Proposition

- ▶ A Proposition is a sentence in which the subject and predicate are combined in order to state something as true or false. A Proposition therefore either affirms or denies.
- ▶ **Parts of the Propositions**
- ▶ • **Subject** – is about which something is affirmed or denied.
- ▶ • **Predicate** – is what affirmed or denied to the subject.
- ▶ • **Copula** – is either is (am, are) if affirmative or is not (am not, are not) if negative.

# Types of Proposition

- ▶ Axioms : A self-evident truth that requires no proof.
- ▶ Postulate: to assume without proof, or as self-evident; take for granted.
- ▶ Definition : the act of defining, or of making something definite, distinct, or clear, so is to add something to a term that make it defined,
- ▶ Direct and indirect: just when adding a subject to a predicate