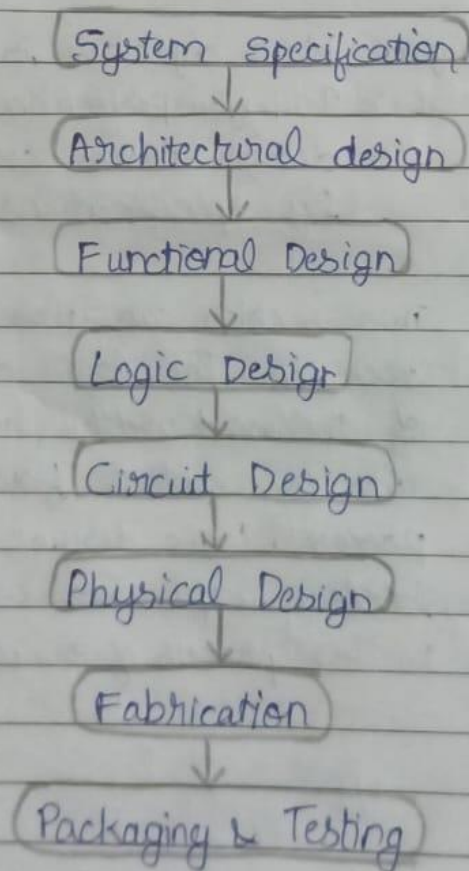


VLSI refers to the process of creating integrated circuits by combining many transistors onto single silicon chip. VLSI design involves various complex steps and methodologies to ensure the successful creation of these intricate electronic systems. ~~on a structural~~

VLSI design flow is a systematic approach used to ensure the efficient and effective development of integrated circuits. One of the primary objectives of the design flow is to minimize the design cycle while maximising the quality and reliability of the final product.

VLSI design flow chart:



1. System Specification: The objective of the desired final product is written in this step. Designated cost, performance, architecture and how the system will communicate with external are to be determined.
2. Architectural design: The architecture design stage lays the foundation ~~base~~ for VLSI chip. The structure & concept of IC are determined. Designers make critical decisions, such as choosing between RISC and CISC, deciding on cache size, pipeline structures and handling float-point operations.
3. Functional Design: Main objective is to generate/design a high performance architectural design within cost requirements posed by specifications.
4. Logic Design: This section can also be stated as RTL description. The logic design takes care of the word widths, register allocation, and also the control flow of the fabrication process. Logic design comprises the boolean expressions which can be used in the process of simulation & verification.

5) Circuit design: Logic blocks of the desired design are replaced by the electronic circuits, which consists of electronic devices such as resistors, capacitors & transistors. Circuit simulation is done in order to verify the timing behaviours of the desired system.

6) Physical design: The actual layout of the desired system is ~~done~~ done. A layout is constructed by describing logic components such as diodes & transistors in their respective geometric models, and also the interconnections between them are also represented by various lines in multiple layers.

7) Fabrication: After the actual layout & verification of the desired design, the design is sent for manufacturing. Generation of the data for manufacturing is referred as streaming out. The desired design is onto the different layers of the design using photolithographic process. ICs are manufactured on round silicon wafers with a diameter from 200mm to 300mm, these ICs are then tested & are marked as functional or defective.

8) Packaging and Testing: After fabrication of design, functional chips are then packed. Packaging is configured early in desired design process. Package types may include DIPs, PGA's and BGA's.