

DSD

Digital System Design

Reference books

- “A VHDL Primer” by J.Bhasker
- “Digital System Design using VHDL” by Charles H. Roth
- “Digital System Design” by Neelu chaudhary or Yogesh Mishra

Section-A

- Introduction to Computer-aided design tools for digital systems.
- Hardware description languages
- Introduction to VHDL data objects, classes and data types, Operators, Overloading, logical operators.
- Types of delays
- Entity and Architecture declaration.
- Introduction to behavioral dataflow and structural models.

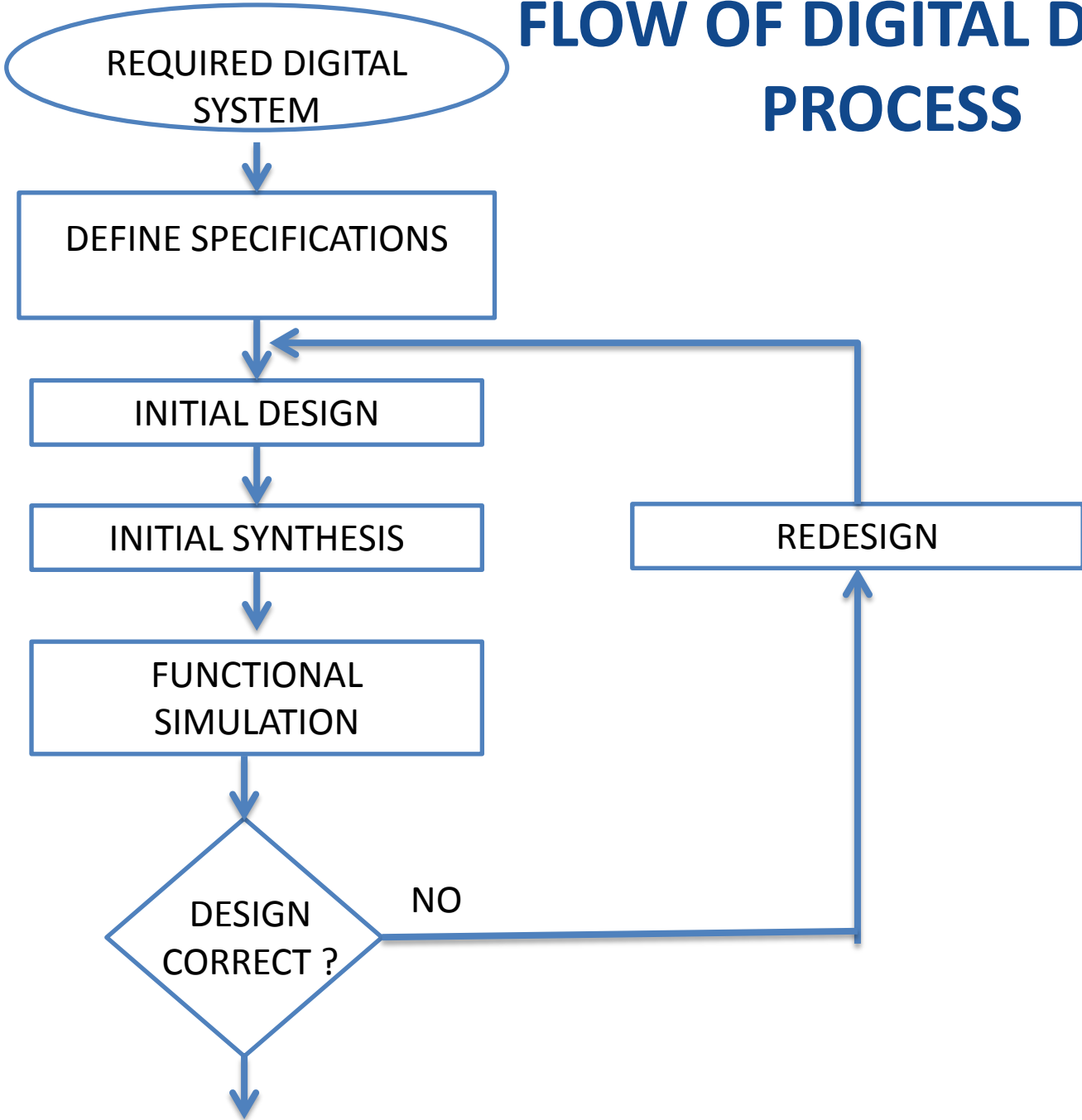
Introduction to Computer-aided design tools for digital systems

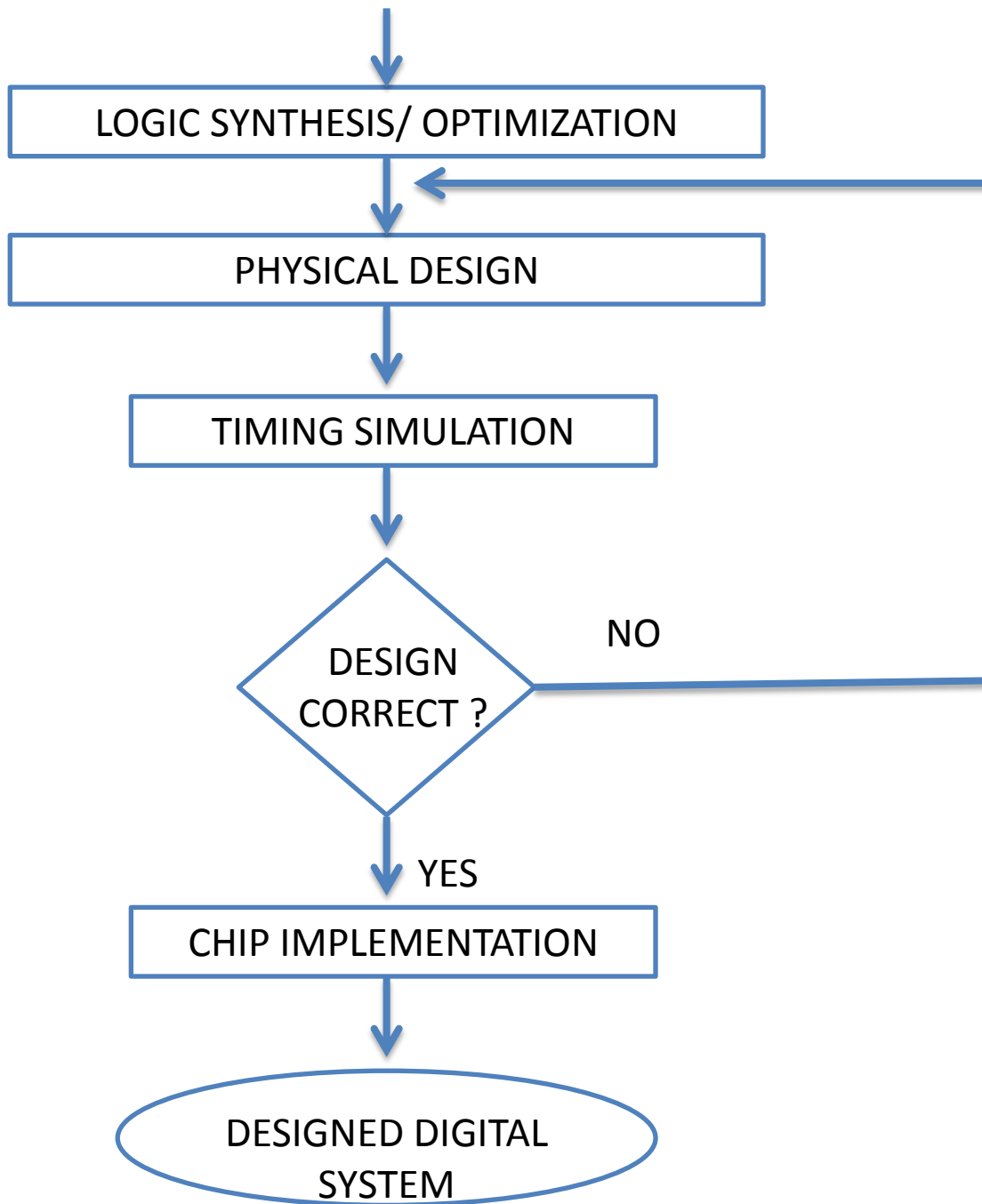
- The design methods which make the use of computer are known as Computer Aided Design methods.
- CAD tools refer to software tools that aid the development of circuits, systems and other things.
- Different CAD Tools for digital systems are:
 - Schematic entry tools
 - HDLS
 - HDL compilers, simulators and synthesis tools
 - Simulators
 - Test benches
 - Timing Analyzers and verifiers.

Applications of CAD Tools:

- For design and simulation of capacitive micro-accelerometer.
- In micro and macro systems
- In typical filter design cycle
- Designing of MEMS Devices

FLOW OF DIGITAL DESIGN PROCESS





VHDL

VH S I C → Very High Speed Integrated Circuit

Hardware

Description

Language

- It is a language used to describe digital circuits.
- It is similar to computer programming except HDL is used to describe hardware rather than a program to be executed.

VHDL

- It is a hardware description language that can be used to model a digital system.
- The VHDL language can be regarded as an integration of the following languages:
sequential language +
concurrent language +
net-list language +
Timing specifications +
waveform generation language => VHDL

VHDL's History

- In 1981: Department of Defense of USA was involved with various vendors to purchase VHSIC chips and all those vendors were using different HDL to describe their product.
- Due to this DoD was facing problem of testing and verification. At that time the need of a standard HDL which is capable of design, documentation and verification of digital system was generated.

VHDL's History (cont.)

- In 1983: DoD gave contract to IBM, Texas Instruments and Intermetrics to develop a language which can describe a hardware.
- In 1985: Version 7.2 VHDL was developed and released for public . In 1986, to standardize the language it had been handed over to IEEE
- In 1987: Standard Version of VHDL “ IEEE Std 1076-1987” was launched for industrial use.
- In 1993: language was upgraded with new features and upgraded version “ IEEE Std 1076-1993” was launched.