Course Outline

Introduction to Verification

- Introduction to Verification
- Verification Plan, Importance, Types of Errors
- Functional Verification, Verification and Tests
- Flow of Simulation Based Verification, Verification Languages

Introduction to System Verilog

- Introduction to System Verilog
- Verilog and System Verilog

Data Types

- Data Types: Signed and Unsigned.
- Enumeration, Enumeration Methods
- String
- Arrays: Dynamic Array, Dynamic Array Methods, Associative Array, Associative Array Methods
- Queues and Lists, Queues Methods
- Structures
- Unions

Program Control

- Introduction to Operators
- Looping: Do Loop, For Loop, Foreach Loop, Disable, Break and Continue

Packages

- Introduction to Packages
- Using Packages

Casting and Compilation Unit

- Casting: Static casting, Dynamic Casting, Cast Errors
- Compilation Unit

Task and Function
• Static and Automatic  
• Task  
• Function  

Inter Process Communication and Synchronization

• Semaphores  
• Mailboxes: Simplex and Duplex

Dynamic Process

• Fork Join  
• Fork Join Any  
• Fork Join None  
• Wait Fork  
• Disable Fork

OOP in System Verilog

• Understanding OOP  
• OOP Terminology  
• Class Constructors, Class Object creation, This  
• Inheritance, Overriding, Super, Virtual Method, Data Hiding: Local, Protected and Inheritance  
• Polymorphism: Without Virtual Keyword, With Virtual Keyword  
• Abstract  
• Encapsulation: Access Specifiers

Interface

• Interfaces: Advantages of using Interfaces, Interface Declaration  
• Ports: Interface Ports and Modports  
• Interface Methods  
• Virtual Interface, Advantages of Virtual Method

Randomization and Constraints Types of Stimulus Generation

• Random Testing: Concept and Theory, Directed Randomization, Object Based Randomization  
• Rand Modifier and Randc Modifier  
• Constraint Block: Dist operator and Random case, Constraints Overriding  
• Random Sequences

Assertions
• Understanding Assertions
• Types of SV Assertions
• SV Assertion Layers, Comments on Layers
• Boolean expression in Assertion, Sequences, Named Sequence, Asserting a Sequence, Other useful building blocks
• Creating Properties, Named Properties, Property Operators
• Sequences v/s Properties

Functional Coverage

• Coverage: Structural Coverage and Functional Coverage
• Functional Coverage and SV. SV Coverage Terminology
• Covergroup
• Coverpoint
• Cross
• Bins: Classes of Bins, Autobins, User Defined Bins
• Clocking Event
• Guard