

**NIRMA UNIVERSITY**  
**SCHOOL OF TECHNOLOGY, INSTITUTE OF TECHNOLOGY**  
**M.Tech. in Electronics & Communication Engineering (VLSI Design)**  
**M.Tech. Semester - II**  
**Department Elective III**

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<b>Course Code</b>	<b>6EC170ME22</b>
<b>Course Title</b>	<b>Advanced Topics in Verification and System Verilog</b>

**Course Learning Outcomes (CLOs):**

At the end of the course, the students will be able to -

1. Use the concept of Object-Oriented Programming for verification
2. Develop the higher level testbench using System Verilog
3. Choose effective methods for verification of complex digital designs.

**Syllabus:**

**Teaching Hours: 30**

<b>UNIT I: Timing Analysis</b>	<b>04</b>
Importance, Issues and Challenges, Static and Dynamic Timing Analysis, Set-up and Hold Violation and Remedies	
<b>UNIT II: Logic and Fault Simulation</b>	<b>04</b>
Introduction, Simulation Methods, Logic Simulation, Fault Simulation, Serial and Parallel fault simulation	
<b>UNIT III: Higher Level Verification Guidelines</b>	<b>06</b>
Constrained Random Stimulus, Testbench Components, Layered Testbenches, Code Reuse	
<b>UNIT IV: Data Types, Procedural Statements and Routines</b>	<b>05</b>
Data Types, Types of Arrays, Packages, Tasks, Functions, Void Functions, Time Values, Case study	
<b>UNIT V: OOPS for Testbench</b>	<b>06</b>
OOPS Terminology, Class Methods, Building a testbench using OOPs	
<b>UNIT VI: Functional Coverage</b>	<b>05</b>
Gathering Coverage data, Coverage types, Functional Coverage Strategies, Anatomy of a cover group, Analyzing coverage data	

**Self-Study:**

The self-study contents will be declared at the commencement of Semester. Around 10% of the questions will be asked from self-study contents.

**Laboratory Work:**

Laboratory work will be based on the above syllabus with a minimum of 10 experiments to be incorporated.

**Suggested Readings:**

1. Jenick Bergeron, Writing Testbenches using System Verilog, Springer
2. Spear, Chris, Tumbush, Greg, System Verilog for Verification-A Guide to Learning the Testbench Language Features, Springer