

<b>Course Title</b>	<b>ASIC Design</b>	
<b>Course Code</b>	<b>ET113</b>	
<b>Course Credit</b>	Lecture	: 04
	Practical	: 01
	Tutorial	: 00
	Total	: 05
<b>Course Objective</b>		
The objective is to learn Hardware descriptive programming language programming language, test bench, FPGA and CPLD architecture, floor planning, placement and its hardware implementation.		
<b>Detailed Syllabus</b>		
<b>Sr. No.</b>	<b>Chapter Name and Course Content</b>	<b>Hours Allotted</b>
<b>Section I</b>		
1	<b>ASIC Design flow</b> Design Methodologies, Introduction to Hardware Description Language (VHDL): Structural, Behavioral, Data flow modeling, Concurrent and sequential VHDL, RAM and ROM, Test Benches, Finite State Machines, RTL Synthesis Test Methodology	<b>20</b>
2	<b>High Frequency ASIC Design</b> Design criteria for high frequency communication application	<b>5</b>
<b>Section – II</b>		
2	<b>Programmable Logic Design</b> Basics of Programmable logic devices, CPLD Architecture and its building blocks, FPGA Architectures and its building blocks, Technology mapping for FPGAs	<b>15</b>
3	<b>Design Implementation</b> Design implementation using CPLD and FPGA, Floor planning and Placement	<b>10</b>

### **Instructional Method and Pedagogy:**

- Lectures will be conducted with the aid of multi-media projector, black board, OHP etc.
- Assignments based on course content will be given to the students at the end of each unit/topic and will be evaluated at regular interval.
- Seminar/Tutorials will be conducted.
- The course includes a laboratory, where students have an opportunity to build an appreciation for the concepts being taught in lectures.
- Minimum 10 experiments shall be there in the laboratory related to course contents.

### **Students Learning Outcomes:**

At the end of the course students will have good understanding about HDL (VHDL, Verilog, etc.) and can able to implement design module on FPGA and CPLD.

### **Text book:**

1. D.Perry, BHDL,2nd Ed., McGraw Hill International.
2. J. Bhasker, BHDL, Primer, Pearson Education Asia, Low Price Edition

### **Reference Books:**

1. Charles H Roth, Jr., Digital Systems Design Using VHDL, Brooks/Cole Thompson Learning
2. Navabi, VHDL: Analysis and Modeling of Digital Systems, McGraw Hill International Editions
3. Michael John Sebastian Smith, Application Specific Integrated Circuits, Pearson Education Asia.

### **Additional Resources**

- Xilinx and Altera Application Notes on the architecture of FPGAs and CPLDs.