**Course Number and Name**

BEC010 - VLSI DESIGN

**Credits and Contact Hours**

3 and 45

**Course Coordinator’s Name**

Ms M. Jasmin

**Text Books and References**

**REFERENCES:**


**Course Description**

- To learn basic CMOS Circuits.
- To learn CMOS process technology.
- To learn techniques of chip design using programmable devices.
- To learn the concepts of designing VLSI Subsystems.

**Prerequisites**

- Electronics Circuits & Principles of Digital Electronics

**Co-requisites**

- Nil

required, elective, or selected elective (as per Table 5-1)

Selected Elective

**Course Outcomes (COs)**

CO1: Identify the various IC fabrication methods.
CO2: Express the layout of simple MOS circuit using Lambda based design rules.
CO3: Apply the Lambda based design rules for subsystem design.
CO4: Differentiate various FPGA architectures.
CO5: Design an application using Verilog HDL.
CO6: Concepts of modeling a digital system using Hardware Description Language.

**Student Outcomes (SOs) from Criterion 3 covered by this Course**

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List of Topics Covered

UNIT I  MOS TRANSISTOR THEORY  
MOSFET- Enhancement mode & Depletion mode – Fabrication – NMOS, PMOS – CMOS fabrication – P-well, N-well, Twin-Tub, SOI – BiCMOS Technology –Comparison with CMOS.

UNIT II  MOS CIRCUITS AND DESIGN  

UNIT III  SUBSYSTEM DESIGN & LAYOUT  

UNIT IV  PROGRAMMABLE LOGIC DEVICES  

UNIT V  VERILOG HDL DESIGN PROGRAMMING  
Basic concepts: VLSI Design flow, Modeling, Syntax and Programming, Design Examples:Combinational Logic – Multiplexer, Decoder/Encoder, Comparator, Adders, Multipliers, Sequential logic- Flip Flops, Registers, and Counters, Memory- Introduction to back end tools.