Semester I

Course Code: ELE-500
Course Title: Micro Electronics and VLSI Design
Number of Credits: 04 **Total Hours: 60** **Total Marks: 100**
Effective from AY: 2022-23

Prerequisites for the course		
Should have graduate level knowledge in analog and digital electronics		
Objectives of Course		
This course is intended to: ● Introduce to the VLSI Technology, various fabrications processes involved in IC design , ● Analysis of Electronics circuits, Design examples of VLSI circuits, Circuit Optimization techniques ● Advance circuits designs: Memory, Registers, Synchronous circuits etc.		
Course Content		
Unit I	An overview of VLSI, Modern CMOS Technology	**4 Hours**
Unit II	Silicon Logic, Logic design with MOSFET.	**6 Hours**
Unit III	Physical structure of CMOS Integrated circuits	**6Hours**
Unit IV	Fabrication Technologies of CMOS Integrated Circuits	**7 Hours**
Unit V	Elements of Physical Design	**4 Hours**
Unit VI	Electrical characteristics of MOSFETS	**6 Hours**
Unit VII	Electronic analysis of CMOS Logic gates	**6 Hours**
UNIT VIII	Advanced Techniques in CMOS Logic Circuits	**6 Hours**
UNIT IX	System specifications using HDL, General VLSI	**5 Hours**

	components	
UNIT X	Memories and Programmable Logic	**10 Hours**

Pedagogy

Lectures/Experiential Learning

Course Outcome

Students will,

- Design fundamental gates and customize them for specific electrical and electronics application,
- Understand the fabrications processes involved in VLSI technology,
- Write the Hardware descriptive form of circuits, Synchronize the combinational and sequential circuits, design a static and dynamic memory cell,
- Understand the Programmable logics building blocks

References/Readings

1. Introduction to VLSI Circuits and Systems, John P. Uyemura, WILLEY.
2. Principles of CMOS VLSI Design, N.H.E. W. & Eshahiraghian, Addison Wesley
3. Modern VLSI Design System on Silicon, Pearson Education Asia. By W. Wolf.
4. VLSI Technology, S.M. Sze, McGraw -Hill (1995). 5.Basic VLSI Design, Douglas Pucknell, K. Eshraghian, Prentice Hall India.