**13EC3204-DIGITAL DESIGN**

(ECE)

**Lectures/Week:4Hrs. Sessional Marks:40**

**Univ. Exam. Duration:3Hrs Univ Exam.Marks:60**

**UNIT – I**

**MOS Amplifiers:** Common source amplifier with resistive load, Common Drain amplifier. Differential amplifier, transfer characteristics and derivation of CMRR.

**Current Mirrors:** Basic Current Mirrors, cascode current mirror and active current mirrors without signal analysis.

**UNIT – II**

**Digital Integrated circuits:** Evaluation of ICs, Advantages and classification of ICs. Digital IC characteristics, Digital IC families- DTL, HTL, ECL, MOS, CMOS, TTL-Totem-pole, Open collector and Tristate outputs and IC packaging’s.

**UNIT – III**

**VHDL INTRODUCTION AND LANGUAGE FUNDAMENTALS:**

VHDL History – **Design methodology:** - Description style, Direction of design, design flow, step in digital system design. **Hardware modeling issue:** concurrency, delays, delta time and back annotation – organization of a VHDL design file – libraries.

**Language fundamentals:** Basic sequential statements – Date types – Assignment statements and operators – **Objects in VHDL: Signals**, Variable, constants, files-attributes of objects – VHDL package, package body and configurations – Entity declarations and statements – Examples of simple circuits.

**UNIT – IV**

**COMBINATIONAL CIRCUIT BUILDING BLOCKS:**

Multiplexes, Decoders, Encoders – Code converters and their implémentation using VHDL.

**UNIT – V**

**SEQUENTIAL LOGIC DESIGN:** Latches and flip-flops, registers counters (Asynchronous and synchronous) BCD, Ring and Johnson counter and their implementation using VHDL.

**TEXT BOOKS:**

1. Design of analog CMOS Integrated circuits by Behzad Razhavi.
2. Ronald J.Tocci, Neal S.Widmer, “Digital systems — Principles and applications”. 8th edition, Pearson Education Asia, 2001.
3. B.S .sonde, Introduction to system design using ICs Wiley Eastern.
4. S.S. Limaye, ‘VHDL – A design oriented Approach, ‘TMH edition (2008)
5. John Wakerley “Digital Design Principles”

**REFERENCE BOOKS**

1. Stephen Brown and zvonkovranesic, ‘Fundamentals of digital design with

VHDL, TMH edition (2007).

2.APGodse&Bakshi Digital IC Application-Technical Publications.