

REPORT ON ONE DAY ADD-ON LECTURE ON

“Signals and Systems and its Application in VLSI Design”

Overview

Guest Lecture on **“Signals and Systems and its Application in VLSI Design”** on the 19th of July 2025 was organized by the Department of Electronics and Communication Engineering and presided by **HoD (ECE) Dr. Shima Ramesh** and the **Chief guest Dr Shantanu Mehta (Senior Analog Design Engineer at Alpha core Inc.), Bangalore.**

The Venue was Seminar Hall – 5 (10.30 AM to 12:30 PM).

Dr Shantanu Mehta, a renowned expert in design and implementation of high-speed current-steering and voltage-mode DACs, bandgap references, LDOs, level shifters, and power-on reset circuits, delivered an insightful lecture that provided a comprehensive overview on modeling transistor behaviors and optimizing analog layouts for performance and reliability, highlighting its critical importance in the VLSI Design. Signals and systems is a fundamental field in electrical and electronics engineering, dealing with the analysis, manipulation, and understanding of signals (functions conveying information) and systems (devices or algorithms that process signals). Its concepts are crucial in areas such as communication, control systems, signal processing, and VLSI (Very Large-Scale Integration) design.

The lecture was structured around the primary verticals of Signals and Systems and its Application, which include:

System Modeling and Analysis: Modeling circuits as systems for timing, behavior, and power analysis. Topics covered included Signal & System Concepts such as System response (impulse, step), Transfer function, Frequency response

Types of Systems & Operations. It includes the types of systems such as Linear vs. Nonlinear, Time-Invariant vs. Time-Variant, Causal vs. Non-Causal, Stable vs. Unstable. Topics covered Basic Operations on Signals like Time Shifting, Time Scaling, Time Reversal, Signal Addition and Multiplication.

Types of Signals & its Properties: Types of Signals such as Continuous-Time Signals, Discrete-Time Signals, Analog Signals, Digital Signals, Periodic and Aperiodic Signals, Deterministic and Random Signals, Even and Odd Signals. It includes System Properties Like Memory, Stability, Causality

Applications: It includes applications Communication systems, Control systems, Used in mobile phones, smart devices, and streaming platforms for real-time audio/video processing. Topics covered Importance of Sampling Theorem, Nyquist criterion, Quantization, S/N ratio. Poles & Zeros concept, Z transform, Convolution.

The lecture also touched on emerging trends and challenges in design and implementation. The growing prevalence of Signal and Systems, importance of raw data used in artificial intelligence (AI) often comes from signal were also discussed.





Overall, 100 students and 10 faculty members participated. This workshop was a good learning experience for the participants. This lecture provided a well-rounded understanding of the various facets of the field. It emphasized the necessity of a Signals and Systems in Communication Systems, Medical Technology, Control and Automation. the knowledge shared in this lecture is invaluable.

RESOURCE PERSON ACCOUNT DETAILS:

Account

Name: Shantanu Mehta

Account number: 31208806481

SBI