National Institute of Technology Rourkela

Departmental Seminar

Seminar Title	: Design Considerations of Signal Acquisition Circuit Development for Piezoelectric Pressure Sensor.
Speaker	: Ankit Shaw
Supervisor	: Prof. Sudip Kundu
Venue	: VLSI Lab
Date and Time	: 06 Jan 2025 (06.30PM)
Abstract	: This paper presents a comprehensive study on the design, modeling, and validation of a signal acquisition system for piezoelectric (PZ) sensors. The article focuses on modeling piezoelectric device behavior, including the development of an electric equivalent circuit to represent sensor characteristics. A key component discussed is the design of a low-cost charge amplifier, which amplifies the small electrical charges generated by piezoelectric sensors. The paper details the design considerations and performance evaluation of the charge amplifier. Experimental results, along with simulation-based verification, validate the system's efficacy, demonstrating consistent performance in capturing the PZ sensor's output. The integration of an STM32 microcontroller enables data acquisition with high-speed ADCs, ensuring reliable signal storage, processing, and analysis.