National Institute of Technology Rourkela

Departmental Seminar

Seminar Title	: Design and Implementation of Fuzzy Logic Control Strategy for PV-Battery Microgrid
Speaker	: Pranati Rani Purohit (523ee2008)
Supervisor	: Prof. Arnab Ghosh
Venue	: Seminar Room (EE-205)
Date and Time	: 21 Jul 2025 (03:40 PM)
Abstract	: To address the needs of isolated off-grid DC loads, an effective energy management approach is required for a microgrid integrated with renewable energy sources. This research presents a voltage and current controller strategy based on fuzzy logic for a battery storage system integrated with a photovoltaic (PV) system, aiming to enhance energy management. The battery's power flow is controlled via a bidirectional buck-boost converter through a fuzzy logic controller. Energy management based on fuzzy logic is proposed, utilizing only three membership functions for the voltage and current control technique. Optimizing the duty cycle of a DC-DC boost converter is the key to achieving maximum power point tracking (MPPT) using the Perturb and Observe (P&O) method. Using a changing PV irradiation profile, the energy management system is substantiated in a MATLAB model.