National Institute of Technology Rourkela

Departmental Seminar

Seminar Title	: Integration of Pico Hydro Power System with PV based DC Microgrid
Speaker	: Jayadev Meher
Supervisor	: Prof. Krishna Roy
Venue	: Seminar Room (EE-205)
Date and Time	: 17 Jul 2025 (4:00 PM)
Abstract	: The innovative integration of pico hydro power systems with photovoltaic (PV)-based DC microgrids offers an efficient and sustainable solution for decentralized energy generation, particularly in remote and off-grid areas. This paper delves into the unique architecture, control strategies, and operational benefits of this integration. The study emphasizes the importance of maximum power point tracking (MPPT) through SEPIC converter for PV, the integration of pico hydro generator through diode bridge rectifier fed buck (DBRB) converter, load-sharing between the sources and battery, and the integration of energy storage element through bidirectional buck-boost converter for DC link voltage stability. A proportional and integral (PI) controller is designed to stabilize the DC link voltage and ensure proper power distribution between the sources. The proposed system's effectiveness is validated through simulation using the MATLAB/Simulink software.