
Registration Seminar

Seminar Title	: Development of PV-Fuel Cell Hybrid Power System with Enhanced Dynamics using Hybrid ANFIS-PI and ABC-WOA optimization
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Supervisor	: Venkata Ramana Naik N.
Venue	: EE 401 Seminar Room
Date and Time	: 17 Apr 2025 (11:00)
Abstract	: This research focuses on the design and development of an integrated power system comprising solar photovoltaic (PV), fuel cell stack and rechargeable lithium-ion battery. Individually, these energy sources face numerous challenges to overcome these challenges, an integration or hybridization of multiple sources is proposed. Various methods for integrating multiple power sources have been explored, with their merits and demerits discussed. The chosen approach is a multi-input non-isolated DC-DC converter due to its advantages over other methods. Those are its uncomplicated structure, fewer parts, decreased expenses, and superior dependability when compared to isolated DC-DC converters. This arrangement also enables a more condensed layout and decreased losses, rendering it an effective option for hybrid power systems. The proposed DC-DC converter features two unidirectional power input ports interfacing the solar PV and fuel cell stacks, and one bidirectional power input interfacing the rechargeable battery. Additionally, this research delves into the design specifications, modeling, and control methods of the proposed system, focusing on the implementation of an Adaptive Neuro-Fuzzy Inference System (ANFIS) combined with a Proportional-Integral (PI) controller for enhanced dynamic response. The proposed system is simulated in the MATLAB Simulink environment, and the results are presented.