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Departmental Seminar

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Seminar Title	: A Dual Output Dual Duty Nonisolated DC-DC Converter for DC Microgrid Application
Speaker	: Ananya Pritilagna Biswal (520ee3018)
Supervisor	: Prof. Krishna Roy
Venue	: Seminar Room (EE-205)
Date and Time	: 23 Jul 2025 (3:40 PM)
Abstract	: Nowadays, conventional fossil fuels are being replaced by renewable energy sources to tackle the increasing demand. Ongoing energy crises and emission issues can be mitigated to some extent by using clean energy. Eco-friendly energies derived from solar and fuel cells need to be integrated with the DC microgrid owing to their low output voltage. High gain and high-efficiency dc-dc converters are gaining popularity for establishing a proper interconnection between sustainable energy resources and DC microgrids. Therefore, to meet this purpose, an ultrahigh voltage gain step-up dc-dc double-duty dual-output (DDDO) converter is proposed in this article. The main objective is to achieve higher gain with the proposed double-duty triple-mode converter without utilizing voltage lift techniques, transformers, and coupled inductors. The single input and dual-output structure consists of three power switches and two nonisolated inductors. The three semiconductor switches operating with only two duty ratios are the superiority of this topology. Therefore, this converter can develop extremely high voltage even at non-significant duty ratios due to such organization of the components. This manuscript provides a detailed analysis of voltage gain and the working principle of the converter during steady-state. The MATLAB/SIMULINK platform, with mathematical analysis, validates the feasibility and sustainability of the proposed ultra-high gain converter.