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Notice for the PhD Viva Voce Examination

Mr Kiran K, Registration Number: 1670088, PhD Scholar at the School of Engineering and Technology, CHRIST (Deemed to be University) will defend his PhD thesis at the public viva-voce examination on Saturday, 29 August 2026 at 11.30 am in the Conference Room, Block I, Bangalore Kengeri Campus, CHRIST (Deemed to be University), Bengaluru - 560074, Karnataka, India.

Title of the Thesis	:	**Development of Green Nanoparticles as Additives for Waste Cooking Oil-Derived Biodiesel Blends and Their Performance Evaluation**
Discipline	:	**Mechanical Engineering**
External Examiner - I	:	**Dr Ramesh M R** Professor Department of Mechanical Engineering National Institute of Technology, Karnataka Surathkal, Mangaluru - 575025 Karnataka
External Examiner - II	:	**Dr Mrityunjay Doddamani** Associate Professor Department of Mechanical Engineering Indian Institute of Technology, Jodhpur Jodhpur, Jheepasani Rajasthan - 342030
Supervisor	:	**Dr Gurumoorthy S Hebbar** Professor (Former) Department of Mechanical and Automobile Engineering School of Engineering and Technology CHRIST (Deemed to be University) Bangalore Kengeri Campus Bengaluru - 560074 Karnataka

The members of the Research Advisory Committee of the Scholar, the faculty members of the Department and the School, interested experts and research scholars of all the branches of research are cordially invited to attend this open viva–voce examination.

Registrar (Academics)

Place: Bengaluru
Date: 10 August 2026

ABSTRACT

The depletion of fossil fuel reserves and growing environmental concerns have intensified the need for sustainable alternative fuels for compression-ignition engines. In the present investigation, waste cooking oil-derived biodiesel enhanced with green-synthesized ZnO nanoparticles was developed and experimentally evaluated to improve engine performance and reduce exhaust emissions. ZnO nanoparticles were synthesized via a green, environmentally sustainable route using cow dung as a biological reducing and stabilizing agent. The synthesized nanoparticles were characterized using UV–Visible spectroscopy, XRD, FTIR, SEM, and EDAX analyses. Waste cooking oil collected from institutional canteens was converted into biodiesel through alkaline-catalyzed transesterification. The prepared biodiesel blends containing green-synthesized ZnO nanoparticles were experimentally investigated in a single-cylinder compression ignition engine. Experimental results revealed improved brake thermal efficiency and reduced brake-specific fuel consumption, carbon monoxide, and hydrocarbon emissions. Injection pressure optimization and 20% Exhaust Gas Recirculation (EGR) effectively reduced NOx emissions while maintaining satisfactory engine performance characteristics

Keywords: *Waste cooking oil biodiesel, Green-synthesised ZnO nanoparticles, Transesterification, Fuzzy–NSGA-II optimisation, Biodiesel blends, Exhaust emissions.*

Publications:

1. **K. Kavalli**, G. S. Hebbar, and A. Rout, "Application of Fuzzy NSGA II for achieving maximum biodiesel yield from waste cooking oil," Environmental Science and Pollution Research, vol. 32, no. 24, pp. 36342–36363, Aug. 2025.
2. **K. Kavalli**, G. S. Hebbar, J. P. Shubha, S. F. Adil, M. Khan, M. R. Hatshan, A. M. Almutairi, and B. Shaik, "Green Synthesised ZnO Nanoparticles as Biodiesel Blends and Their Effect on the Performance and Emission of Greenhouse Gases," Molecules, vol. 27, no. 9, pp. 1-15, Apr. 2022.
3. **K. Kiran** and G. S. Hebbar, "Optimisation of Biodiesel Production from Waste Cooking Oil by Box-Behnken Design Using Response Surface Methodology," International Journal of Renewable Energy Research, vol. 11, no. 1, pp. 344-354, Mar. 2021.