

# Dr. Kalil Basha J

Engineer | Researcher | Academician

An enthusiastic researcher with hands-on experience in combustion and internal combustion (IC) engine studies gained at premier institutes. Highly motivated to contribute to research teams and organizations, with a strong interest in advancing knowledge and expertise in advanced technologies for future powertrains. Passionate about applying innovative approaches to address real-world challenges in engine technology and sustainable fuels.



## Research Interests

- Low temperature combustion
- High - efficiency advanced combustion modes
- Pre-chamber spark ignition system
- Combustion diagnostics
- Zero/low carbon alternate fuels
- Engine sector simulations
- IC Engines

## Skills

- Solid works
- Converge CFD simulations
- MATLAB Coding
- Auto CAD

## Personal Details

**Address:** 88/1, Katcheri Street,  
Periyar Nagar, Velur road,  
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**Google scholar link:**

<https://scholar.google.com/citations?user=XeEXYLUA-AAJ&hl=en>

## Academic Background

- Doctor of Philosophy (Mechanical Engineering) – National Institute of Technology, Tiruchirappalli. CGPA - 8.75. (2019-2025)
- M.E (Thermal Engineering) – Government College of Engineering, Salem (Anna University - Chennai). CGPA - 8.48. (2012-2014)
- B.E (Mechanical Engineering) – Trichy Engineering College, Tiruchirappalli (Anna University - Chennai). CGPA - 8.14. (2008-2012)
- HSC – Government Higher Secondary School, Chittalandur. Percentage - 82.33 %. (2007-2008)
- SSLC – Government Boys Higher Secondary School, Tiruchengode. Percentage - 88 %. (2005-2006)

## Professional Experience

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|--------------------|-----------------------------------------------------------------------------------------------------------------------------------|
| 06/2026 – Till now | Assistant Professor (SG)<br>Department of Mechatronics Engineering,<br>K C G College of Technology,<br>Chennai.                   |
| 07/2019 – 06/2025  | – Full-time Research Scholar, Department<br>of Mechanical Engineering, National<br>Institute of Technology,<br>Tiruchirappalli.   |
| 08/2018 – 05/2019  | – Temporary Faculty,<br>Department of Mechanical Engineering,<br>National Institute of Technology,<br>Tiruchirappalli.            |
| 06/2014 – 04/2018  | – Assistant Professor,<br>Department of Mechanical Engineering,<br>Dhanalakshmi Srinivasan Engineering<br>College,<br>Perambalur. |

## International Journals

- **Jeelan Basha KB**, Balasubramani S, Sivasankaralingam V. “Effect of pre-chamber geometrical parameters and operating conditions on the combustion characteristics of the hydrogen-air mixtures in a pre-chamber spark ignition system”. *International Journal of Hydrogen Energy*, 2023;48:25593–608. <https://doi.org/10.1016/j.ijhydene.2023.03.308>, (SCIE – Q1 & IF – 8.1).
- **Jeelan Basha KB**, Balasubramani S, Sivasankaralingam V. “An experimental study on the influence of nozzle hole numbers and patterns of a passive pre-chamber spark ignition system”. *International Journal of Hydrogen Energy* 2024;91:1207–20. <https://doi.org/10.1016/j.ijhydene.2024.10.226>. (SCIE - Q1 & IF – 8.1).
- **Jeelan Basha KB**, Balasubramani S, Sivasankaralingam V. “Effect of pre-chamber geometrical parameters and hydrogen enrichment on the combustion and flame characteristics of zero / low carbon fuels”. *Energy*, 2025;326:136365. <https://doi.org/10.1016/j.energy.2025.136365>. (SCIE – Q1 & IF – 9.4).
- **Jeelan Basha KB**, Balasubramani S, Sivasankaralingam V. “Recent Developments with Pre-chamber Spark Ignition System for Lean Burn Combustion Engines: A Review”, *Journal of Thermal Analysis and Calorimetry*, 2025; <https://doi.org/10.1007/s10973-025-14367-6>. (SCIE – Q2 & IF – 3.2).
- Krishna Aggarwal, **Jeelan Basha KB**, Balasubramani S, Sivasankaralingam V, Yang Wenming, “Influence of Design and Operating Conditions on the Thermal Performance of a Ring-Shaped Micro-Combustor: A Numerical Study”, *Applied Thermal Engineering*, 2025. (SCIE – Q1 & IF – 6.9).
- Arun Kumar Mathiyazhagan, **Jeelan Basha KB**, Balasubramani S, Sivasankaralingam V “Schlieren-Based Visualization and Neural-Network Prediction of Synthetic OME-1 Fuel Spray Dynamics under Elevated Operating Conditions”, *Energy*, 2026. (SCIE – Q1 & IF – 9.4).
- Arun Kumar Mathiyazhagan, **Jeelan Basha KB**, Balasubramani S, Sivasankaralingam V, Keerthivasan Sounder, Susmitha Sivasubramanian, Ganapathy Kailash Senthilkumar, “Numerical Investigation of Oxymethelene Ether-1/Diesel RCCI Combustion: Influence of Fuel Energy Share and Injection Timing”, *Applied Thermal Engineering*, 2026. (SCIE – Q1 & IF – 6.9).

## Book Chapter

- **Jeelan Basha KB**, Balasubramani S, Sivasankaralingam V. “A Comprehensive Review on the Modeling of Biomass Gasification Process for Hydrogen-rich Syngas Generation”, *Waste to Profit*, Taylor & Francis.

## Conferences

- **Jeelan Basha KB**, Sivasankaralingam V. “A Review on Pre-chamber ignition system for SI engine Applications”. 2<sup>nd</sup> world congress on IC engines conference proceedings; 2021.
- **Jeelan Basha KB**, Sathishkumar Balasubramani, Srivishnu Janakiraman, Shivangi Das, Vedharaj Sivasankaralingam. “Data-Driven Prediction of Fuel Spray Dynamics using a Novel Hybrid Machine Learning Technique”. ICFVIT - 26, Department of Mechanical Engineering, IIT Madras.

## Workshops Attended

- “Green Ammonia: A Key Player in the Carbon – Free Energy Revolution”, Department of Mechanical Engineering, National Institute of Technology, Tiruchirappalli.
- “Advanced Combustion Technologies for Hydrogen-Based Fuels (ACTHF – 2024)”, Department of Mechanical Engineering and Centre for Combustion and Emission Studies”, National Institute of Technology, Tiruchirappalli.
- “Environmental and Energy Impacts of Biomass Thermochemical Process”, Department of Mechanical Engineering, National Institute of Technology, Tiruchirappalli.
- “Fire Research in Propulsion Systems” National Centre for Combustion Research and Development (NCCRD), Indian Institute of Technology, Madras.

- “*Combustion-Generated Pollution Control*”, Department of Mechanical Engineering, National Institute of Technology, Tiruchirappalli.
- “*Recent Technologies on Waste to Energy Conversion*”, Department of Mechanical Engineering, National Institute of Technology, Tiruchirappalli.
- “*Biofuels and Combustion Research*”, Department of Mechanical Engineering, National Institute of Technology, Tiruchirappalli.
- “*Hybrid & Fuel Cell Electrical Vehicles and Competing Automotive Power Trains*”, Department of Mechanical Engineering, PSG College of Technology, Coimbatore.

#### **Bachelor’s Thesis**

- “*Setting Time Reduction in Horizontal Keyway Milling Machine*”, Trichy Engineering College, Tiruchirappalli, Anna University, Chennai, 2012.

#### **Master’s Thesis**

- “*Heat Transfer Enhancement on Double Pipe Heat Exchanger by Wire Coiled Turbulators, Taper Wire Coiled Turbulators, Pin Wire Coiled Turbulator*”, Government College of Engineering, Salem, Anna University, Chennai, 2014.

#### **Doctoral Dissertation**

- “*Experimental Investigations on the Combustion and Flame Jet Characteristics for Zero/Low Carbon Fuels with Pre-Chamber Spark Ignition System*”, National Institute of Technology, Tiruchirappalli, 2025.

#### **Graduate student supervision**

##### **B. Tech Thesis directed**

- Effect of Pre-chamber Internal Shape on the Combustion Characteristics of a Passive Pre-chamber Spark Ignition System: A Numerical Study.
- Numerical Investigation on the Effect of Energy Share and Fuel Injection Timing with RCCI Combustion Mode.
- Effect of Pre-chamber Nozzle Hole Structures on the Combustion Characteristics of SI Engine.
- A Numerical Study of Pre-chamber and Conventional SI Engine Combustion.

##### **M. Tech Thesis directed**

- Optimization of Micro Combustor Design for Micro Thermo Photovoltaic Applications.
- Numerical Simulation of Different Passive Pre-chamber Configurations for SI Engine Applications.
- Numerical Study on the Effect of Fuel Injection Parameters on the Combustion and Emission Characteristics of CRDI Diesel Engine.
- Effect of Orifice Location and Orientation on the Pre-chamber Combustion Characteristics of Methane/air mixtures.

**Yours Sincerely,  
Dr. J. Kalil Basha**