Department of Mechanical Engineering
NATIONAL INSTITUTE OF TECHNOLOGY KARNATAKA, SURATHKAL

Ref. No. 30/NITK/SERB/MECH/RM/2025-26/A9 06/11/2025

Advertisement for Student Internship

Applications are invited for the position of Student Internship in a research and development project **(SERB-CRG**) with the following details:

Title of the project:

"Investigations on inertial migration dynamics of aerosol particles"

Principal Investigator:
Dr. Ranjith M,
Associate Professor, Department of Mechanical Engineering,
National Institute of Technology Karnataka (NITK), Surathkal, Mangalore-575025, Karnataka
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Email: mranji1@nitk.edu.in

Co-Principal Investigator:
Dr. Krishnan C M C,
Associate Professor, Department of Electrical &Electronics Engineering
National Institute of Technology Karnataka (NITK), Surathkal, Mangalore-575025, Karnataka
Email: cmckrishnan@nitk.edu.in

Name of the position: Student Internship

No. of Positions/Vacancies: Two

Qualifications:
Essential Qualifications:- Candidate studying in Prefinal year or final year **B.E./B.Tech** in Mechanical/ Electrical or other allied disciplines with a minimum of 65% aggregate score (6.5/10 CGPA).

Desired Skills:-
- Basic exposure to MATLAB, PYTHON, ANSYS, AI/ML Modelling.
- Ability to work in a team, good communication skills, experience in numerical simulation work either using a programming language (MATLAB or PYTHON) or with a commercial software like ANSYS and developing machine learning models.

Age Limit: 25 years (Preferrable)

Salary:
- **Rs. 5,000 Only**

Duration: 01 Month (During December 2025)
How to apply: Interested candidates must apply with the following documents (1) Cover letter (2) Bio-data with passport-sized photograph, (3) Scanned copies of educational certificates and

mark sheets, class X onwards.
The soft copies of all the above documents (pdf format) must be **emailed to the P.I., Dr. Ranjith M (mranji1@nitk.edu.in) by 21st November, 2025**. The email address for correspondence is given above. Only shortlisted candidates will be intimated by email and called for **Offline interview**. The position is available immediately (during December 2025 for a period of ONE month only). The appointment will be on a purely temporary basis co-terminus with the project.

About the project:

Total duration: 3 YEARS (2023-2026)-Funding Agency: Science & Engineering Research Board (SERB) (Currently known as Anusandhan National Research Foundation (ANRF))

Project summary:

Inertial migration is an effective passive separation technic employed in microfluidics for sorting and separation of various shaped particles under different background flow conditions. Recently, the Covid-19 pandemic has made the separation of bioaerosol particles an important subject of matter to research community for disease control and safety of human health. With this perspective, the present proposal investigates the inertial migration dynamics of aerosol particles in channel flow under different fluid flow conditions and channel configurations. The inertial migration finally leads to attaining stable equilibrium positions in the channel from where it can be separated for further bioanalysis and applications. The determination of equilibrium positions and time to reach these positions known as migration time are highly significant for effective design of separation devices. These parameters are affected by background flow conditions, channel shape and dimensions, particles size and shape and its initial position. Also, separation of multiple particles under different conditions need to explore since such situations happens in the real word simulations. Hence, development of an efficient three-dimensional computational model is essential to address these features by performing series of numerical simulations. This is the prime objective of the present proposal which will implement through immersed boundary method as the numerical tool. In the next stage, prediction models for inertial migration and separation will be developed using artificial neural networks using the simulation data which will help in the design and optimization of efficient microfluidic separation and sorting devices for biomedical applications in the field of inertial microfluidics. The determination of external control force through numerical simulations and prediction models for designing predefined migration and separation strategies will also be significant achievement of this proposal.