



Department of Mechanical Engineering
NATIONAL INSTITUTE OF TECHNOLOGY KARNATAKA, SURATHKAL

Ref.: 21/NITK/SERB/MECH/RMR/2023-24/A9

Date: 23 April 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: Performance evaluation of HVOF sprayed NiAl intermetallic based composite coatings for aerospace repair and manufacturing applications

Principal Investigator:

Dr. Ramesh M R

Professor, Department of Mechanical Engineering,

National Institute of Technology Karnataka, Surathkal, Mangalore-575025,

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Co-Principal Investigators:

Dr. Sharnappa J

Professor, Department of Mechanical Engineering,

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Name of the position: Student Internship

No. of Positions/Vacancies: Two

Qualifications:

Essential Qualifications: - Candidate studying in Prefinal or final year **B.E./B.Tech.** in Mechanical or other allied disciplines with a minimum of 60% aggregate score (6.5/10 CGPA).

Age Limit: 25 years (Preferrable)

Salary: Rs. 5,000/month

Duration: 01 Month

How to apply: Interested candidates must apply with the following documents: (1) Cover letter (2) Bio-data with a 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 Principal Investigator, Dr. Ramesh M.R. (rameshmr@nitk.edu.in), by 09 May 2025**. The email address for correspondence is given above. Only shortlisted candidates will be intimated by email and called for an **Offline interview**. The position is available immediately. The

appointment will be purely temporary, co-terminus with the project duly following institute norms and project guidelines.

About the project:

Funding Agency: Science & Engineering Research Board (SERB)

Project summary:

With increasing challenges due to surface degradation by wear, corrosion, and oxidation, most engineering components used in power plants and aircraft industries face problems such as reduced performance and product design life. The demand for novel material capable of addressing many issues in a single go is the need of the hour. The coating must have high-temperature erosion, corrosion and oxidation resistance in the boilers or gas turbines. This is because addressing any surface degradation type does not help challenge environments. It is well known that NiAl alloy possesses high-temperature properties. Still, studies about their use as thermal spray coatings have not been explored in detail, especially when NiAl is reinforced with hard phases like CBN and SiC. The NiAl possesses an ordered crystal structure, low density, high melting point, high hardness, high mechanical strength, high-temperature corrosion and wear resistance.

On the other hand, CBN and SiC particles are fundamental. They are known for their high melting point, low density, and extremely high hardness. They can exhibit high chemical resistance, high-temperature strength, thermal shock resistance, and wear and abrasion resistance. These attributes are the perfect choice as a reinforcing phase for tackling surface degradation issues. So, this proposal focuses on developing novel NiAl composite coatings with CBN and SiC as reinforcing phases using HVAF and laser remelting techniques. The produced coatings could be used to protect boiler components in power plants or repair some aircraft components. High-temperature sliding wear, erosion, and oxidation studies will be carried out. How the addition of CBN and SiC will affect the high-temperature behaviour of NiAl composite coatings will be studied in detail.