Proposal for announcing seat under the Institute Internship Program

(separate form to be filled for seat under Institute funding and project funding)

1. Name of faculty member proposing: Dr. Nisha Verma
2. Department/Centre: Materials Research Centre
3. Topic on which work is proposed: Micromechanical Analysis using Finite Element Analysis (FEA)

4. Preferred period of internship (after May 20th): Between 20th May 2024 to 19th July 2024

5. Qualification of student (branch/semester of study): Pursuing BE/B.Tech/M.Tech in Mechanical or allied subjects with background and interest in Mechanical Behaviour of Materials, Finite Element Methods.

6. Brief description of work (300-500 words): The planned investigation seeks to delve into the flexural behavior of ceramic-based composite tool materials using a blend of experimental testing and numerical simulation methods. Employing the Finite Element Method (FEM), microstructure models will be crafted to integrate crucial factors like secondary phase volume fraction, nano-scale particle volume fraction, layered structure, and grain diameter distribution of the materials. These models will facilitate the simulation of three-point bending tests to assess the flexural strength of the ceramic composite materials. Additionally, the study will systematically scrutinize the underlying deformation mechanism of the ceramic composite during micromechanical testing.

7. Expected learning of student (upto 100 words): Understanding the fundamental principles of formulation techniques in the Finite Element Method (FEM) is crucial for students' future research endeavors. It involves recognizing the utility and attributes of Finite Element Analysis (FEA) elements, including bars, beams, plane elements, and iso-parametric elements. This understanding enables comprehensive analysis and optimization of complex engineering problems. Acquiring proficiency in FEM software skills will further enhance students' skill sets, making them invaluable for both research and job opportunities in the future.

8. Nature of work: (Experimental/**simulation**/mathematical modelling/data collection-analysis etc.): upto 50 words: The project entails constructing a Finite Element Method (FEM) model incorporating microstructure features of ceramic composites. Subsequently, calculations will be conducted to comprehend the stress state induced during a three-point bend test

9. If the seat is under project sponsored category: Yes/**No**
   a) If yes, number of seats announced:
   b) Name and ID no. of project from which stipend is chargeable

Nisha

Signature of faculty member

Name of department/Centre

Material Research Centre

Note:

a) Proposing faculty member needs to be available at the Institute during the period internship is offered
b) No extra space or funding than the stipend will be provided by the institute for this purpose