

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: **Prof. Rajendra Kumar Goyal**
2. Department/Centre: **Department of Metallurgical and Materials Engineering**
3. Topic on which work is proposed:
Novel Polymeric Nanocomposites for Aerospace Applications
4. Preferred period of internship (after May 20th): **Between 25th May 2024 to 20th July 2024**
5. Qualification of student (branch/semester of study): **2nd or 3rd year of B.E. (any discipline) or 1st or 2nd year of M.Sc. (Physics, Materials Science, Nanotechnology etc.)**
6. Brief description of work (300-500 words):

High performance polymer matrix and appropriate fillers will be blended using industry friendly technique followed by hot pressing. The electrically conductive fillers will be varied 0-20 wt.%. The processing parameters will be optimized to get minimum value of percolation threshold. The resultant samples will be characterised by different instruments such as TGA/DSC/dilatometer, dynamic mechanical analyser, two-probe conductivity meter etc. to determine thermal, mechanical and electrical properties of the developed nanocomposites. Moreover, microstructure of the nanocomposites will be studied using optical microscope (OM)/scanning electron microscope (SEM). Based on the results, student will be able to claim the application of the developed nanocomposites for aerospace.
7. Expected learning of student (upto 100 words):
Students are expected to learn following;
 - Understanding about the type of composites, fillers and applications
 - Selection of reinforcement and polymer matrices
 - Processing of polymer matrix nanocomposites
 - Characterisation of polymer matrix nanocomposites by XRD, SEM, UTM, electrometer, DMA, digital multi-meter, vector network analyser etc.
 - Microstructures of the neat polymer matrix and nanocomposites.
 - Interpretation of the results and discussion.
8. Nature of work: (Experimental/simulation/mathematical modelling/data collection-analysis etc.): upto 50 words

The internship project involves experimental work (more than 20 experiments), preparation of samples for all the testing and characterisation, interpretation of the results and their discussion.

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



Signature of faculty member

Name of department/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