



Project Proposal for Ph.D.

Project Details (The research problem must clearly indicate the need for an interdisciplinary approach)

Project Title	Advanced Polymer-Based Suspension Components for Railway Applications
Project Summary (Minimum 500 and maximum 2000 characters)	The innovative polymer based materials are needed for the newer upcoming application like development of high speed railway track. The polymers such as Polyurethane, TPU, and Nylon have load-bearing properties and can be tailored to obtain its improved mechanical properties. We will study how polymer chemistry and mechanical design can work together to improve suspension systems, abrasion, energy dissipation and durability of the compounds. We will explore how combination of raw materials, processing methods, and additives affect strength, wear resistance, and durability. We aim to use modern tools, simulations, and testing to predict performance of the products.

Ph.D. Supervisors*
(Supervisor 1 and Supervisor 2 cannot be from the same department of IITD)

Role	Name of Faculty	Academic Unit in IITD/Institute/University	Email ID (Official)
Supervisor 1*	Sudip K Pattanayek	Department of Chemical Engineering, IITD	sudip@chemical.iitd.ac.in
Supervisor 2	Naresh V Datla	Department of Mechanical Engineering, IITD	datla@mech.iitd.ac.in

*Supervisor 1 must be from IIT, Delhi.
+All cells in this table are mandatory fields that need to be filled by faculty for consideration of proposal.
§The date of superannuation of supervisors should be at least three years from the date of registration of selected candidates.

Project requirements (Student qualifications, experience required, etc)
*The candidate will be shortlisted based on common shortlisting criteria decided by ScRC (SIRe)

- MS/MSc/M.Tech in Chemical Engineering/Mechanical Engineering
- B.E./B.Tech. in Chemical Engineering/Mechanical Engineering and valid GATE score in the above discipline, which is waved off for the part time candidate.

Source of fellowship/funding and project number
(CSIR/UGC/DBT/ICMR/ICAR/NEET-PG/DST-INSPIRE/IRD/FITT Project details, if any)

Project Fellowship/ Part-Time

Role of Faculty Members involved:

Supervisor-1	Guiding the chemistry/polymer physics and rheology component of project.
Supervisor-2	Guiding the mechanical behavior and characterized component of the project

Note :-

- 1. Approval from the respective DRC/CRC/ScRC of your Department/Centre/School will be required for using the "Full-time Institute Assistantship (Category-wise) (FIA)" for selecting the students in SIRe.**
- 2. Declaration:- Faculty members, please ensure that you have at least 3 years of service left before superannuation along with adequate sitting space & lab facilities for the SIRe student.**
- 3. PI/s are also encouraged to submit joint proposals with AIIMS, NII, JNU and institutes with which IITD has an existing MoU. If the Co-PI (Supervisor 2) is from outside IITD, kindly share his/her detailed CV.**
- 4. If a research scholar is to be considered for selection under the project fellowship, then the project should have a minimum of two-year duration remaining.**
- 5. A candidate applying with a valid JRF/INSPIRE/any national level fellowship should have at least two-year validity from the date of joining the Ph.D. program.**
- 6. The third supervisor's name (if required) can be added only after the formation of Student Research Committee (SRC) subject to a strong recommendation of SRC and subsequent approval from the competent authority.**
- 7. If Institute fellowship is being sought, then DRC approval of the parent department of Supervisor 1 is required at the time of selection.**