



Project Proposal for Ph.D.

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

Project Title	Pollutant formation, sources and transport in Delhi-NCR
Project Summary (Minimum 500 and maximum 2000 characters)	This project aims to investigate pollutant formation, sources, and transport mechanisms in the Delhi-NCR region, one of the most severely polluted urban environments globally. It will integrate mobile-lab based field measurements, ambient aerosol characterization, emission inventories, statistical techniques and advanced atmospheric modeling to quantify contributions from major sources such as vehicular emissions, industrial activities, biomass burning, and waste incineration. Chemical transformation pathways of key pollutants, including primary particulate matter (PM _{2.5}) and secondary aerosols, will be analyzed to understand their formation under varying meteorological conditions. The study will employ models such as WRF-Chem to simulate dispersion, long-range transport, and local accumulation influenced by boundary layer dynamics and seasonal variability. Outcomes will include source apportionment, identification of high-impact emission sectors, and evaluation of control strategies. The project seeks to provide scientifically robust insights to support policy interventions and improve air quality management in Delhi-NCR.

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	Mayank Kumar	Mechanical Engineering	kmayank@mech.iitd.ac.in ,
Supervisor 2	Vikram Singh	Chemical Engineering	vs225@chemical.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)

- BTech/MTech in Mechanical/Chemical Engineering OR BS/MS in Physics/Chemistry
- Experience in coding, proficiency in statistics and experimentation will be preferred

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

Candidate with his/her own fellowship /Institute Fellowship

Role of Faculty Members involved:	
Supervisor-1	Transport of pollutants and source apportionment
Supervisor-2	Air pollution characterization and chemical transformation

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.**