



Project Proposal for Ph.D.

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

Project Title	Applying process modeling and advanced data analytics for bioprocess optimization
Project Summary (Minimum 500 and maximum 2000 characters)	Recent trends in biopharmaceutical manufacturing involve integration of process modeling and advanced data analytics into the process development workflow. This project will entail creation of novel approaches in this field and then their applications demonstrate the significant benefits that can ensue. Specific things to explore include development and use of digital twins of biopharmaceutical unit operations, mechanistic modeling, data driven modeling, hybrid modeling as means to improve efficiency of process development, optimization and large scale implementation.

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	Anurag S. Rathore	CHE	asrathore@biotechcmz.com
Supervisor 2	James Gomes	KSBS	jgomes@bioschool.iitd.ac.in

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

Qualification:

- M. Tech. in chemical engineering or biochemical engineering (1st division)

Experience required (Mandatory skills)

- 5+ years of experience in biopharma industry

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

Candidates with his own fellowship/CSIR/UGC/DBT/ICMR/DST or equivalent organizations

Role of Faculty Members involved:

Supervisor-1	Prof. Anurag. S. Rathore – Bioprocessing, Process modeling
Supervisor-2	Prof. James Gomes – Process modeling, Process control

Note :-

1. Approval from the respective DRC/CRC/ScRC of your Department/Centre/School will be required for using the "Institute Fellowship (Category-wise)" 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 fellowships should have at least two-year validity from the date of joining of the Ph.D program.
6. The third supervisor 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.