



08/09/2026

Advertisement for the Project Funded PhD Positions

Applications are invited for the PhD program in the Department of Chemical Engineering, IIT Hyderabad as a part of a sponsored / grant-in-aid project as per the following details:

Name of the PhD Supervisor (Project PI)	Narasimha Mangadoddy
Project Title	Development of Low-grade Coal Beneficiation Technology-novel process design using Experiments, CFD & AI-ML inputs
Funding Agency	Coal India Limited, CoE-CLEANZ
Number of vacancies	01
Project Description	Low-grade coal, coal middlings, and rejects constitute significant low-value resources due to their high ash content and poor washability characteristics. Low-grade coal generally contains 30–45% ash and a substantial proportion of near-gravity material (NGM), while coal middlings and rejects may contain 45–65% ash, resulting in poor utilization and increased disposal challenges. The proposed research aims to develop an integrated, scientifically robust, and scalable beneficiation strategy for upgrading these challenging coal resources into value-added products. The research will initially focus on detailed characterization and washability assessment of selected coal resources to establish the relationships among particle size, density distribution, mineralogical composition, liberation characteristics, and ash distribution. Based on the liberation behaviour, optimized comminution involving controlled crushing and fine grinding will be investigated to liberate carbon-rich particles while minimizing excessive generation of ultrafines. The intermediate-size fraction will be subjected to fine dense-medium separation using optimized and novel dense-medium cyclone configurations aimed via CFD modelling route, with emphasis on improving separation efficiency in the presence of high NGM and fine particles. Fine and ultrafine coal fractions will be further investigated using ultrasonic based surface modification followed by selective flotation to enhance carbon recovery and ash rejection. The integrated beneficiation process will be optimized to produce clean coal containing less than 16% ash. In parallel, beneficiation of high-ash coal rejects

	will be investigated with the objective of reducing ash content to approximately 30%, thereby enabling their potential utilization as feedstock for atmospheric fluidized-bed combustion (FBC). Particular emphasis will be placed on understanding separation mechanisms, process interactions, energy and water requirements, and product quality. A major component of the research will involve process modelling via CFD, optimization using AI & ML tools, and scale-up of the laboratory-developed flowsheet to pilot scale. Equipment modification, process hydrodynamics, operating stability, material handling, and scale-up criteria will be systematically evaluated. Finally, techno-economic and environmental assessments will be undertaken to establish the technical feasibility and sustainability of the proposed process. The research is expected to provide a scalable integrated technology for converting low-value coal resources and rejects into useful energy-bearing products.
Eligibility Criteria	1) ME / MTech / MS (by Research) / Integrated Masters in Chemical Engineering or allied disciplines*. <i>GATE score is not required.</i> 2) BE / BTech / 5 – year MSc / MSc / 4 – year BS from CFTIs[#] in Chemical Engineering or allied disciplines*, with CGPA 8.0 or greater. <i>GATE score is not required</i> 3) BE / BTech / 4 – year BS / 5 – year MSc / MSc in Chemical Engineering or allied disciplines*. <i>Valid GATE score or UGC-NET or CSIR is required</i> [#] Centrally Funded Technical Institutes * Allied Disciplines: Mechanical Engineering, Metallurgical Engineering, Mineral Processing and Minerals Engineering <i>Note: The project PI reserves the right to set a different criterion for shortlisting applicants for the selection process which might be equal to or above the Eligibility Criteria.</i>
Desirable Skills	Particulate technology, Mineral processing with experimental or Computational modelling (specially CFD) is highly desirable. Coal processing is also encouraged.
Fellowship (in INR, per month)	As per MoE norms: Rs 37,000 for first 2 years ; Rs 42,000 for the next 2 years. HRA support may be available if applicable.
Duration of Support	4 years ^{a,b} ^a Subject to the candidate meeting all the academic requirements during their PhD program.



	^b Fellowship support for additional 1 year from the Institute may be available depending on the performance of the candidate and the Institute policy
Application Process (How to Apply)	Interested candidates may send the following documents by email to Prof. Narasimha Mangadoddy (narasimha@che.iith.ac.in). 1) Cover Letter indicating your interest in this project and how your background might be suitable 2) Resume 3) Degree Certificates and Transcripts 4) GATE / Entrance Exam Score Card if applicable.
Application Deadline	September 14, 2026 (Monday)
Interview Process	Tentative Interview Date (online mode): The interviews will be tentatively conducted between September 23, 2026 – September 25, 2026. The actual interview date will be communicated to the shortlisted applications by the project PI. Interview Format: The interview will be conducted online via Google Meet. Candidates will be assessed based on their understanding of the core concepts pertaining to their academic background and they might be asked to make a short presentation of any project that they have carried out. Shortlisted candidates will be contacted via email and will be informed in detail about the interview process and any additional requirements well before the interview date. Candidates may contact the project PI for any queries.
Joining Date	Selected candidates will be required to come to campus and complete the joining formalities as per the Institute policy for PhD admission. The joining date will be communicated to the selected candidates by the project PI.