



Project Proposal for Ph.D.

Project Details	
Project Title	Advancement in PEM/Alkaline Electrolyzer: Innovation of Anode/Cathode catalyst for Short Stack H ₂ Production and control
Project Summary (Minimum 500 and maximum 2000 characters)	This project aims to develop PEM/Alkaline electrolyser technology for more efficient hydrogen production with control system. It comprises developing catalysts to maximize the anode's and cathode's performance during electrolysis. The chemistry aspect involves tailoring catalysts for enhanced hydrogen evolution and oxygen evolution reactions. In parallel, these catalysts are being integrated into a short-stack electrolyser for practical testing as a part of implementing process control (balance of plant). The challenge is in this in this project to optimize engineering design for practical implementation while balancing catalyst performance and durability for long-term electrolyser operation. Through this interdisciplinary approach, the project aims to improve electrolyser efficiency, overall viability, and durability for diverse hydrogen applications.

Ph.D. Supervisors			
Role	Name of Faculty	Academic Unit in IITD/Institute/University	Email ID (Official)
Supervisor 1	Prof. Suddhasatwa Basu	Department of Chemical Engineering	sbasu@iitd.ac.in
Supervisor 2	Prof Sukumar Mishra	Department of Electrical Engineering	sukumar@iitd.ac.in

Project requirements (Student qualifications, experience required, etc) *The candidate will be shortlisted based on common shortlisting criteria decided by ScRC (SIRe)
- Candidates who have completed their MTech/MSc in chemical engineering/chemistry/Industrial Chemistry. - Candidates should have a min. 6-month experience in catalyst design and electrochemistry background.

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

Role of Faculty Members involved:	
Supervisor-1	Mentorship, Research Guidance, and Resource Management include funding, equipment, and lab facilities – catalyst development and MEA testing – single cell development and stack development;
Supervisor-2	Mentorship, Research Guidance, and Resource Management include funding, equipment, and lab facilities – stack development, control system development, BOP