OFFICE OF INDUSTRIAL CONSULTANCY AND SPONSORED RESEARCH
INDIAN INSTITUTE OF TECHNOLOGY MADRAS CHENNAI – 600 036

Advertisement No.: ICSR/PR/Advt.228/2026 Dated: 03/11/2026

Applications are invited for the temporary post of **Project Engineer**, in the Department of **Engineering Design, IIT Madras.**

Co-ordinator: Prof. C. S. Shankar Ram, Department of Engineering Design, IIT Madras.

Primary Contact: Sundaresan S A, Professor of Practice, Department of Engineering Design, IIT Madras

Duration: Initially for one year, later extendable based on factors such as performance and project funding.

Number of Vacancies: 01

S. No	Post	Qualification and Experience	Pay
1	**Project Engineer**	• Bachelor's degree in chemical engineering, Mechanical Engineering, Electrochemical Engineering or Materials Science discipline with a Minimum of 75% marks or CGPA of 7.5 or equivalent Candidates with the following additional qualifications will be given preference: • Experience in Collegiate Engineering Design Competitions • Work experience in the design, modelling, and testing of open-system electrochemical devices (Metal-Air Batteries, Fuel Cells, or Flow Batteries) with hands-on system integration experience • Exposure to Software Tools – 1-D and 3-D simulation (e.g. MATLAB Simulink/SimScape, COMSOL Multiphysics, Siemens Simcenter, Ansys, Dymola)	**Consolidated Pay up to Rs 60,000/- to Rs 70,000/-Per month depending on experience**

Job Description: Project Engineer – In-Vehicle Generator Systems (Mobility Applications)

Role Overview

We are seeking self-driven, hands-on, eager to learn and experiment engineers to join as Project Engineer – In-Vehicle Generator Systems to develop high-energy-density metal-air power generators (specifically Aluminum-air or Zinc-air) or integrate Fuel Cells for extended-range or primary auxiliary power in heavy mobility applications.

In this role, you will participate in the complete system lifecycle—from deriving chemical, mechanical, and electrical generator specifications from target vehicle duty cycles, through multi-physics modeling (electrochemistry, multiphase flow, thermal control), structural and fluid stack design, prototype building, bench testing, and eventual integration into the vehicle powertrain architecture.

Key Responsibilities

Application-Driven Specification Derivation & System Sizing

- Translate vehicle-level duty cycles, extended-range requirements, payload profiles, and environmental operating windows into quantitative metal-air generator specifications.
- Derive system specifications including stack voltage/current envelopes, energy and power density targets, electrolyte circulation rates, reaction product management capacities (Al (OH) or ZnO precipitation/slurry handling), and oxygen/air supply volumetric flow rates.
- Perform system trade-off analyses between metal anode cassette replacement/refuelling mechanics, alkaline/gel electrolyte volume, parasitic auxiliary loads (pumps, blowers, scrubbers), and total powertrain energy efficiency.

Design & Engineering (Cell, Stack & Balance of Plant)

- Mechanical, fluidic, and electrochemical design of metal-air cell stacks, including metal anode consumption/feed geometry, air-diffusion cathodes (gas diffusion layers, ORR/OER catalysts), and flow field manifolds.
- Design the Balance of Plant (BoP): electrolyte circulation pumps, heat exchangers, solid precipitate separation/filtration units, air intake filtration, CO scrubbers, and automated anode management/clamping mechanisms.
- Specify sealing materials, corrosion-resistant polymers, nickel/titanium current collectors, and high-conductivity alkaline electrolyte management solutions suitable for dynamic vehicular environments.

Virtual Validation & Multi-Physics Simulation

- Conduct multi-physics virtual validation using continuum electrochemistry, CFD, and thermal simulation tools to model species transport, reaction kinetics, and thermal distribution within the stack.

- Simulate multiphase fluid flow (alkaline electrolyte + solid reaction precipitates + air/gas bubbles) to prevent clogging, electrolyte flooding, or local dry-out across gas diffusion electrodes.
- Model parasitic corrosion mechanisms (e.g., self-discharge and hydrogen evolution at the aluminum or zinc anode) to optimize inhibitor additives and passivation control strategies under idle and load conditions.

Prototyping & Manufacturing Coordination

- Coordinate early-stage stack and BoP prototype builds, collaborating with catalyst suppliers, porous membrane manufacturers, precision plastics moulders, and mechanical fabrication partners.
- Define DFM/DFA (Design for Manufacturing / Assembly) criteria for modular metal-air stack assembly, quick-swap anode cassettes, and automated electrolyte dosing systems.
- Resolve stack compression, fluid sealing, corrosion resistance, and vibration tolerance during prototype manufacturing.

Bench Testing & Experimental Validation

- Formulate comprehensive test plans (DVPR) for cell, stack, and full-generator system validation on custom automated test benches.
- Coordinate hands-on testing: polarization curve characterization (*I*--*V*), energy efficiency mapping, thermal run-up, precipitate removal efficiency, and long-duration continuous power generation tests.
- Correlate multi-physics simulation models with physical test data to refine electrochemical and CFD transport models under dynamic load profiles.

Vehicle Integration & Testing

- Coordinate with High-Voltage Power Conversion, Battery Management System (BMS/GMS), and Vehicle Control Unit (VCU) teams to integrate the generator with DC-DC converters and buffer battery packs for hybrid operation.
- Coordinate vehicle-level installation, including structural mounting, air intake/ventilation routing, electrolyte drain/refill access, and exhaust management (e.g., safe hydrogen dilution and venting).
- Support safety assessments (HARA, HAZOP) regarding high-voltage DC safety, caustic electrolyte containment (e.g., KOH handling), and gas venting in compliance with automotive safety standards.

Selection: Based on a written test (Quantitative, Analytical, Verbal, and Technical Skills) and Interview.

The last date for submission of online application is 23.11.2026.

Self-Declaration: Applicants must declare that all information and documents submitted in support of their application are true, accurate, and complete to the best of their knowledge. Any discrepancy, misrepresentation, or submission of false information, if identified, may result in disqualification of the applicant.

General Instructions to the candidates

1) All the positions are on purely contract basis.
2) The completion of the period of contract will not confer any right for further extension, regularization, permanency at the Institute.
3) Candidates should apply online only in the website https://icandsr.iitm.ac.in/careers/current_openings.php - (**Please check the advertisement number Advt.228/2026 displayed and submit the application for the relevant position**).
4) Separate application has to be filled for each post.
5) The system will accept single application only with the registered login ID (email) for an advertisement, hence the candidate is requested to select the multiple positions (In case, the candidate wishes to apply for more than one position) before the submission of application.
6) The application cannot be edited, reverted once it is submitted.
7) Candidates should not attempt to apply twice for the same post. If multiple applications are received from a candidate for the same post, the candidature will be liable to be rejected.
8) Candidates should follow the prescribed procedure for submission of online application.
9) Candidates are advised to fill their correct and active e-mail addresses in the online application as all correspondence will be made by the Institute through e-mail only.
10) The candidates applying for any post should ensure that they fulfil all the eligibility conditions for the post. Their admission to any stage of the selection process will be purely provisional subject to confirmation that they satisfy the prescribed eligibility conditions. Mere issue of registration certificate / call letter to the candidate will not imply that the candidature has been found eligible.
11) After successful online submission of application, a printout of the application form must be obtained and submitted when called for test. It will be required at the time of document verification/test/interview. Hard copy of the application is NOT to be sent to the Institute.
12) Candidates must be citizens of India. Persons who have migrated from Pakistan with the intention of permanently settling in India or subjects of Nepal are also eligible, but in their case a certificate of eligibility from the Government of India will be necessary for appointment. Such candidates should apply to the Government of India in the Ministry of Home Affairs for necessary certificate and furnish satisfactory proof of having so applied.
13) The prescribed qualifications are minimum and unless specified, they are required for consideration for the post, even if higher qualification has been acquired and the mere fact that a candidate possesses the same will not entitle them for being called for interview.

14) Relevant experience gained after the minimum qualifying degree will only be taken into consideration. Minimum requirements of qualifications and/or experience can be relaxed in respect of exceptionally outstanding candidates.
15) The experience required is relaxable at the discretion of the Institute in the case of candidates belonging to the Scheduled Caste / Scheduled Tribe, if at any stage of selection, the competent authority is of the opinion that sufficient number of candidates from these communities possessing the requisite experience are not likely to be available to fill up the vacancy reserved for them.
16) The Institute reserves the right to restrict the number of candidates for written / skill test / interview to a reasonable limit on the basis of qualifications, level and relevance of experience higher than the minimum prescribed in the advertisement and other academic achievements. The Institute also reserves the right of rejecting any or all the applications without assigning any reasons, therefore.
17) Calling a candidate for test/interview merely indicates that it is felt that the candidate with others may be suitable for the post and conveys no assurance whatsoever that they will be recommended or selected or their conditions specified in the application will be accepted.
18) Candidates will be short-listed for Test/Interview on the basis of the information provided by them in their online applications. They must ensure that such information is true. If at any subsequent stage or at the time of Test/Interview any information given by them or any claim made by them in their online applications is found to be false, their candidature will be liable to be rejected.
19) The Institute shall verify the antecedents or documents submitted by a candidate at any time at the time of appointment or during the tenure of the service. In case, it is detected that the documents submitted by the candidates are fake or the candidate has clandestine antecedents/background and has suppressed the said information, then their services shall be liable to be terminated.
20) In case of any inadvertent mistake in the process of selection which may be detected at any stage even after the issue of appointment letter, the Institute reserves the right to modify/ withdraw/ cancel any communication made to the candidates.
21) Applicants who are working in **any one of the Project at IIT Madras**, must apply through proper channel otherwise they will be required to produce No-Objection Certificate at the time of document verification/Test/Interview. Candidates without NOC will not be permitted to appear for Test/Interview.
22) Candidates may send testimonials from persons intimately acquainted with their work and character. If the applicant is in employment, the candidate should submit testimonials from the most recent employer or immediate superior as a referee.
23) The Institute has a right to decide the mode of screening and testing the applicant for short listing and selection.
24) The Institute solely reserves the right not to fill any advertised position without assigning any reason
25) Only shortlisted applicants will be contacted.
26) No correspondence whatsoever will be entertained from candidates regarding conduct and result of test/interview and reasons for not being called for interview. Canvassing in any form will be a disqualification.
27) The crucial date for determining the eligibility criteria for all candidates in every respect shall be the prescribed closing date for submission of online application.

28) The Institute strives to have a workforce which reflects gender balance and women candidates are encouraged to apply.

29) Any corrigendum/clarifications on this advertisement, if necessary, shall be uploaded on website and no separate communication will be sent for this purpose.

30) If there is any issue to submit the application please send E-mail to : icsrrecruitment6@icsrpis.iitm.ac.in / icsrrecruitment@icsrpis.iitm.ac.in **Contact: 044- 2257 8843** on all working days from **9.00 AM to 05.30 PM (Monday to Friday – except National Holidays)**. (Please note, only technical issues will be accepted – No interim correspondence with reference to the selection process will be considered).

31) **Instructions to apply online:** Eligible applicants would require to register and apply online through https://icandsr.iitm.ac.in/careers/current_openings.php and submit the application.

Sd/-

CM –HR
Office of IC&SR
IIT Madras