



खान मंत्रालय
MINISTRY OF
MINES

Guidelines & Framework
for

CMiH 2026

***Critical Minerals Innovation
Hackathon 2026***



Host Institute



जवाहरलाल नेहरू एल्युमिनियम अनुसंधान विकास एवं अभिकल्प केंद्र (JNARDDC)

Autonomous body under Ministry of Mines
Amravati Road, Wadi, Nagpur - 440 023, India

August 2026

Organising Authority / Host Institute:

Jawaharlal Nehru Aluminium Research Development & Design Centre (JNARDDC), under the aegis of the Ministry of Mines, Government of India

Target Participants:

Students, researchers, innovators, start-ups and technology teams

1 Background

The Critical Minerals Innovation Hackathon 2026 is proposed as an innovation challenge to identify, develop and demonstrate practical solutions to selected problems in the critical minerals sector. The Hackathon will focus on specific problem statements identified by the Ministry of Mines in areas related to critical mineral exploration, mining, mineral processing, extractive metallurgy, recycling, recovery from secondary resources and associated technological challenges.

The programme will provide shortlisted teams with a defined prototype-development period, access to domain experts/mentors and relevant technical inputs, wherever applicable. Teams will be expected to progressively develop their submitted concept into a demonstrable proof-of-concept or prototype.

The winning solutions will be announced during India Mining Week 2026.

2 Objectives

The Hackathon aims to:

- promote innovative solutions to specific challenges in the critical minerals value chain;
- encourage participation of students, researchers, start-ups, innovators and technology developers;
- connect academia, R&D organisations, industry and Government around identified technological challenges;
- encourage development of technically feasible, cost-effective and scalable solutions;
- facilitate application of emerging technologies, wherever relevant, to mining, mineral processing, metallurgy and recycling;
- develop promising ideas into proof-of-concepts/prototypes through expert mentoring;
- identify solutions having potential for further R&D, pilot-scale demonstration, incubation, technology development or industry adoption; and
- contribute to the objectives of the National Critical Mineral Mission (NCMM) by promoting domestic technological capability and innovation.

3 Scope of the Hackathon

The Critical Minerals Innovation Hackathon 2026 will be organised around two identified Problem Statements notified below.

Problem Statement-01	Mineral Prospectivity Mapping from Open Data
Description/Objectives	Use GSI Bhukosh / National Geoscience Data Repository (NGDR) occurrence data, Sentinel-2 spectral indices and open aeromagnetic/geochemical layers to train a model that flags areas prospective for lithium pegmatites or REE.
Deliverable	Prospectivity heatmap for one district with validation against known occurrences

Problem Statement-02	Smart Technology and Patent Tracker for Critical Minerals
Description / Objectives	Develop a software tool or web application to track, integrate and visualise R&D activities and Indian patent information related to critical minerals. The system should: • Allow users to search by keywords, critical minerals, processes or technology categories. • Fetch and organise information on patents filed/published in India from publicly available patent databases and other relevant sources. • Capture information on ongoing and completed R&D projects, technologies and research outcomes from publicly available data published by relevant Indian R&D organisations, academic institutions, government agencies, PSUs and other institutions. • Provide easy-to-understand analytics on technology trends, leading organisations/institutions, research areas, patenting activity and technology sub-domains. • Identify technology gaps, emerging areas, overlaps and potential opportunities for R&D collaboration and technology development.

	- Optionally alert users to newly published Indian patents, significant patent-status changes and newly reported R&D developments. - Provide an intuitive platform for R&D organisations, academia, industry and policymakers requiring timely intelligence on India's critical-mineral technology ecosystem. The system should go beyond conventional patent-search platforms by integrating Indian patent information with publicly available R&D activities and outcomes, and providing critical-mineral-specific technology intelligence, trend mapping, gap analysis and continuous monitoring to support R&D planning and policy decisions.
Deliverable	An intuitive web-based Smart R&D and Patent Tracking System for critical minerals that aggregates publicly available information on Indian patents and R&D activities undertaken by relevant organisations in India, with keyword/category-based search, technology mapping, trend visualisation, organisation-wise analytics, gap analysis and optional alerts for new developments.

Participants shall submit solutions only against the Problem Statements notified above.

4 Eligibility

Participation is open to:

- students enrolled in recognised universities, colleges and technical institutions;
- research scholars and researchers;
- faculty/research teams from academic and R&D institutions;
- recognised start-ups; and
- individual innovators;

Interdisciplinary teams involving expertise in areas such as geology, mining, mineral processing, metallurgy, materials engineering, mechanical/ electrical/ electronics engineering, computer science, AI/ML, instrumentation and environmental engineering are encouraged. Team shall follow below guidelines:

- Each team shall nominate a Team Leader, who will be the primary point of communication with the Hackathon organizer.
- The maximum team size is five members, including the Team Leader.
- A participant is permitted to be part of only one team.

- Participants in the team shall be from the same organisation / college / institute

5 Hackathon Process

The Hackathon will be conducted through the following stages.

- **Stage 1 – Launch and Publication**
 - The Hackathon, detailed guidelines and approved Problem Statements is published at below websites
 - <https://research.mines.gov.in/>
 - <https://ncmm.jnarddc.gov.in/>
 - <https://jnarddc.gov.in/>
 - <https://nfmrecycling.jnarddc.gov.in/>
- **Stage 2 – Registration and Idea Submission**
 - Interested teams shall first register through the designated Registration Form. Upon successful registration, a unique Registration ID will be generated by JNARDDC and communicated to the registered SPOC/Team Leader through e-mail.
 - The Registration ID shall be used for submitting the proposed solution through the separate Idea Submission Form. Idea submissions without a valid Registration ID corresponding to the registered team may not be considered for evaluation.
 - Link to register: <https://forms.gle/TYfWpMn1s4Q1w2MJ7>
 - Link to submit ideas: <https://forms.gle/9rCtUaHH8RFsNrkdA>
- **Stage 3 – Screening and Shortlisting**
 - At this stage, teams will primarily be evaluated on the quality and feasibility of the proposed concept, and a completed prototype is not mandatory. Eligible submissions will be evaluated by a committee of domain and technology experts.
 - A limited number of teams will be shortlisted against each Problem Statement for participation in the Prototype Development Stage.
 - The decision of the organiser/selection committee regarding shortlisting shall be final.
- **Stage 4 – Orientation, Mentoring and Technical Interaction**
 - Shortlisted teams will be provided:
 - orientation regarding the Problem Statement;
 - interaction with domain experts;
 - mentor allocation;
 - clarification of technical requirements;
 - access to permissible datasets/information, wherever available; and
 - periodic technical interaction during prototype development.
 - Mentors will provide technical guidance while the solution and prototype shall remain the work of the participating team.
- **Stage 5 – Prototype Development**

- Shortlisted teams shall develop/refine their proposed solution during the notified development period.
- Depending upon the nature of the Problem Statement, the output may include:
 - proof-of-concept;
 - functional software/application;
 - algorithm or analytical model;
 - laboratory-scale process demonstration;
 - hardware/device prototype;
 - simulation/digital model;
 - experimental validation;
 - process flowsheet; or
 - other suitable demonstrable technical solution.
- Stage 6 – Final Evaluation and Demonstration
 - Teams shall submit their final deliverables within the prescribed date and present/demonstrate the solution before the Evaluation Committee.
 - Evaluation may include:
 - technical presentation;
 - prototype demonstration;
 - experimental or simulation results;
 - question-and-answer session; and
 - proposed roadmap for further development/deployment.
- Stage 7 – Awards and Recognition
 - The winning team(s) shall be selected based on the final evaluation.
 - Awards and recognition will be announced during India Mining Week 2026.

6 Submission Requirements – Idea Stage

Applications shall be submitted through the designated online form by a Single Point of Contact (SPOC). Team registration shall be undertaken through the designated Registration Form by the Single Point of Contact (SPOC), as applicable. Idea submission shall thereafter be made through the designated Idea Submission Form using the unique Registration ID issued by JNARDDC.

- For teams comprising students or research scholars from universities, colleges or academic institutions, a faculty member from the same institution shall act as the SPOC and submit/register the team.
- A faculty member acting as SPOC may register more than one team from the same institution. A separate Registration ID shall be generated for each registered team, including where the same SPOC registers multiple teams. However, each participating student/researcher and Team Leader shall be associated with only one team.
- Idea submissions without a valid Registration ID corresponding to the registered team may not be considered for evaluation.

- The SPOC is primarily responsible for institutional coordination and communication with the Hackathon Organiser and need not be counted as a team member, unless he/she is participating as a member of the team.
- For faculty/research teams, R&D organisations and recognised start-ups, the Team Leader may also act as the SPOC.
- For an individual innovator, the participant shall act as both the Team Leader and SPOC.
- All official communication regarding registration, shortlisting, mentoring, submissions and evaluation shall be made through the registered SPOC and/or Team Leader, as applicable.

The following details, as applicable, shall be furnished through the Registration Form and/or Idea Submission Form:

- Team Name / Registration ID;
- Team Leader and team-member details;
- institution/organisation details;
- Problem Statement ID and Title;
- proposed Solution Title;
- understanding of the problem;
- proposed solution/approach;
- novelty and key innovation;
- proposed methodology/process flow/system architecture;
- technology to be used, where applicable;
- present status of the concept, if any;
- prototype-development plan;
- expected technical outcomes;
- expected impact;
- scalability/application potential;
- broad cost considerations, where relevant;
- data/resource requirements; and
- declaration regarding originality/IP.

The submission may be supported by a concise technical proposal / presentation.

7 Shortlisting Criteria – Idea Stage

Initial proposals may be assessed using the following indicative criteria:

Criterion	Weightage
Understanding of the Problem Statement	15
Novelty and Innovation	20
Technical Approach and Scientific/Engineering Merit	20
Feasibility of Developing the Proposed Solution	20
Potential Impact and Relevance to Critical Minerals	15
Scalability / Potential for Further Development	10

Total**100**

The minimum qualifying score for shortlisting is 65 and number of teams against each problem statement will be decided at the later stage.

8 Prototype Development and Final Deliverables

Shortlisted teams are expected to submit, as applicable:

- functional prototype/proof-of-concept/model/process demonstration;
- technical presentation;
- concise technical report;
- system/process architecture or flow diagram;
- experimental, simulation or performance results;
- comparison of achieved results against proposed KPIs;
- demonstration video, where physical demonstration is not feasible;
- estimated implementation requirements/cost, wherever applicable;
- limitations and technical risks; and
- roadmap for scale-up, pilot demonstration or further development.

The exact deliverable requirements can be tailored to the nature of each Problem Statement.

9 Final Evaluation Criteria

Final evaluation shall place greater emphasis on the demonstrated solution and its technical merit, rather than only on the original concept.

Criterion	Weightage
Technical Merit and Soundness of Approach	20
Innovation / Novelty	15
Prototype / Proof-of-Concept / Demonstration	25
Performance against Problem Requirements / KPIs	15
Potential Impact in the Critical Minerals Sector	10
Feasibility, Scalability and Deployment Potential	10
Presentation, Understanding and Future Roadmap	5
Total	100

The Evaluation Committee may seek supporting evidence for claims made by the teams. Where required, the Committee may also prescribe minimum qualifying requirements for technical feasibility or prototype performance.

In the event of a tie, preference may be given sequentially to the team obtaining the higher score in:

- Prototype / Proof-of-Concept / Demonstration;
- Technical Merit;
- Performance against Problem Requirements; and

- Innovation / Novelty.

10 Mentorship Framework

Shortlisted teams may be supported through a pool of mentors comprising, as relevant:

- mining and geology experts;
- mineral-processing experts;
- metallurgists and materials specialists;
- critical-mineral and recycling experts;
- scientists and researchers; and
- industry/domain experts.

Mentoring shall primarily help teams understand the challenge, clarify technical issues and improve the proposed solution. Mentors will not undertake development work on behalf of participating teams.

11 Data, Information and Confidentiality

Where datasets, technical information, or other resources are required for development of a solution, the Organising Authority may facilitate access to such resources subject to availability, confidentiality, safety and applicable rules.

Participants shall:

- use information supplied under the Hackathon only for the intended purpose;
- not disclose confidential information to unauthorised persons;
- not attempt unauthorised access to systems or databases;
- appropriately acknowledge external datasets, software and technical resources; and
- comply with any specific confidentiality or data-use conditions communicated by the Organising Authority.

Anonymised, representative or synthetic datasets may be provided where actual operational data cannot be shared.

12 Intellectual Property

The following broad principles will apply:

- **Pre-existing Intellectual Property:** Participants shall retain ownership of intellectual property, know-how, software, designs, processes or other proprietary material demonstrably developed or owned by them prior to participation in the Hackathon.
- **IP Developed During the Hackathon:** Intellectual property arising from a solution, prototype, software, process, design or other work independently developed by a participating team during the Hackathon shall ordinarily remain with the

respective participant/team, subject to applicable law and any rights of their institution/organisation.

- Where an innovation is jointly developed by members of a team, ownership and rights among the team members shall be governed by their mutual/institutional arrangements. The Organising Authority shall not be responsible for resolving internal ownership disputes.
- Submission of an idea, solution or prototype to the Hackathon shall not, by itself, constitute transfer or assignment of intellectual-property ownership to JNARDDC or the Ministry of Mines.
- Participants shall declare that the submitted solution is their original work or that they possess the necessary rights/permissions for any third-party intellectual property incorporated into the solution.
- Any open-source software, datasets, algorithms or other third-party technologies used shall comply with the applicable licence and usage conditions.
- The Organising Authority may use non-confidential descriptions, photographs, presentations, demonstration material and brief details of shortlisted/winning solutions for evaluation, reporting, event communication and publicity, without acquiring ownership of the underlying intellectual property.
- Participants shall be responsible for taking appropriate measures for protection of potentially patentable or otherwise proprietary developments prior to their public disclosure or demonstration, wherever considered necessary.
- Where a selected solution is proposed to be taken forward after the Hackathon through Government/JNARDDC funding, use of specialised facilities, collaborative R&D, pilot demonstration, incubation, technology transfer, licensing, procurement or commercial deployment, the ownership, access, licensing, benefit-sharing and utilisation of any further intellectual property generated shall be governed through a separate agreement between the concerned parties before commencement of such activity.
- Participation or selection in the Hackathon shall not automatically create any right or obligation for subsequent funding, licensing, procurement or commercialisation.
- Detailed intellectual-property, confidentiality and technology-utilisation conditions, if required, may be notified by the Organising Authority before commencement of the prototype-development stage.

13 Safety and Responsible Development

- All teams shall follow applicable laboratory, electrical, mechanical, chemical, digital and workplace safety requirements.
- No prototype shall be tested at an operational mine, mineral-processing facility, metallurgical plant or other industrial location without prior permission of the concerned authority.
- Where solutions involve hazardous chemicals, high-temperature operations, machinery, drones, electrical equipment or other potentially hazardous

activities, teams shall identify associated risks and appropriate mitigation measures.

- The Organising Authority may prohibit any activity considered unsafe or inconsistent with applicable rules.

14 Awards and Further Opportunities

Two awards/prizes will be provided to the best-performing solution(s) under each notified Problem Statement.

- 1st Winning Team: Cash prize of ₹1,50,000/-
- 2nd Winning Team: Cash prize of ₹1,00,000/-

In addition to monetary awards, selected teams may be considered, as appropriate, for:

- certificates and recognition;
- interaction with Ministry/industry/R&D stakeholders;
- further technical mentoring;
- incubation support;
- collaborative R&D;
- pilot-scale demonstration;
- linkage with relevant Government programmes/schemes; or
- other technology-development opportunities.

Such subsequent support shall not be automatic and shall be subject to technical merit, availability of suitable programmes/funding and applicable rules.

15 Code of Conduct and Disqualification

Participants shall maintain professional and ethical conduct throughout the Hackathon. A team may be disqualified for:

- plagiarism;
- misrepresentation or fabrication of results;
- submission of work without appropriate ownership/authorisation;
- breach of confidentiality;
- unauthorised access to systems or data;
- violation of safety requirements;
- providing materially false information; or
- other serious violation of the notified guidelines.

The Organising Authority reserves the right to seek clarification from any participant / team before taking a decision.

16 Indicative Timeline

Indicative Period	Activity	Platform / Mode
25 August 2026	Launch/ publication of Hackathon and Problem Statements	Satyabhama, JNARDDC and designated portals; email and social media
25 August – 20 September 2026	Team registration and Idea Submission	Online submission platform / Google Forms available at JNARDDC's NFM recycling portal
21 – 25 September 2026	Screening of submissions and announcement of shortlisted teams	Designated JNARDDC portal JNARDDC's NFM recycling portal
26 September – 2 October 2026	Orientation, mentor allocation, technical interaction and data/resource access, wherever applicable	Online mode / designated collaboration platform Online mode
3 – 30 October 2026	Prototype / Proof-of-Concept Development	Team development with periodic mentor interaction Team development
30 October 2026	Final prototype and technical submission	Online / designated platform Online through JNARDDC's NFM recycling portal
31 October – 10 November 2026	Final evaluation, presentation and prototype demonstration	Evaluation by nominated Expert Committee at JNARDDC Nagpur
15 – 17 November 2026	Announcement of winners / awards during India Mining Week 2026	India Mining Week 2026

The above schedule shall be indicative and may be modified by the Organising Authority, if required.

17 Governance and Implementation Structure

17.1 Competent / Steering Authority

Ministry of Mines is the competent authority, will provide overall guidance and approve:

- Problem Statements;
- eligibility conditions;
- evaluation methodology;
- shortlist/final results;
- awards; and
- major changes in the Hackathon framework.

17.2 Organizing Authority / Hackathon Secretariat – JNARDDC

JNARDDC Nagpur will coordinate activities relating to:

- publication and outreach;
- registration and submission;
- participant communication;
- coordination of screening/evaluation;
- mentor and expert interaction;
- documentation;
- online platforms;
- compilation of results; and
- coordination of awards during India Mining Week.

For further information and clarifications, please contact:

Overall Coordinator:

- Shri R N Chouhan, Senior Principal Scientist, JNARDDC
- E-mail: rnchouhan@jnarddc.gov.in
- Mobile (Office): +91 9370601183

17.3 Screening / Evaluation Committee

A committee comprising suitable domain experts, scientists, academicians, industry experts and/or members including members from relevant Ministry's technical committees such as PERC/TEC, wherever approved, will undertake evaluation of submissions and final prototypes.

17.4 Mentors / Domain Experts

Suitable mentors/domain experts will be nominated by JNARDDC for shortlisted teams to provide technical guidance during prototype development.

18 General Conditions

- Participation in the Hackathon shall imply acceptance of the notified guidelines.
- The Organising Authority will verify eligibility and information submitted by participants.
- Shortlisting will not create any entitlement to funding, procurement, incubation or further engagement.
- The Organising Authority may modify the schedule, process or evaluation arrangement due to administrative or technical requirements.
- The decision of the competent authority regarding selection and awards shall be final.
- Matters not specifically covered in these guidelines shall be decided by the Organising Authority / Competent Authority.