National Engineers' Day 2025

Engineering Excellence Driving India Forward

14 September, 2025

> Our nation is blessed to have a skilled and talented pool of engineers who are contributing to nation building.
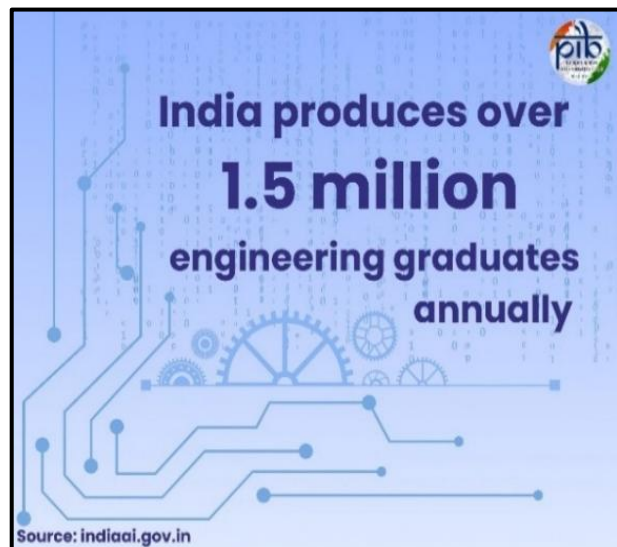>
> -Prime Minister Narendra Modi

Key Takeaways

- India is home to nearly 20% of the world's chip design engineers.
- According to the Stanford AI Index 2024, India ranks first globally in AI skill penetration.
- India's National Quantum Mission aims to develop quantum computers with up to 1000 physical qubits by 2031.
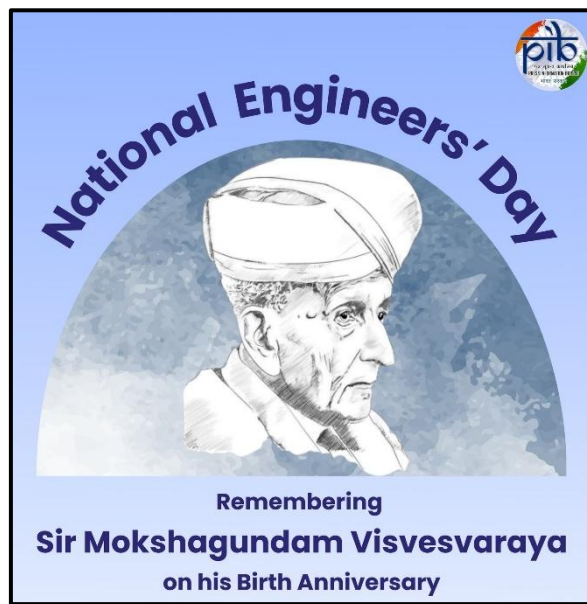
Introduction

National Engineers' Day is celebrated every year on September 15 to honor the birth anniversary of **Sir Mokshagundam Visvesvaraya**, one of India's greatest engineers. **Renowned for his pioneering contributions to engineering, he transformed the country's infrastructure through innovative designs, visionary planning, and practical solutions that combined technical excellence with social impact.** Beyond his work as an economist, statesman, and writer, it is his extraordinary achievements as an engineer that continue to inspire generations, setting a benchmark for problem-solving, innovation, and nation-building.

As India embarks on its **Techade, a decade of rapid technological innovation and transformative growth, the role of engineers becomes increasingly vital**. The growing number of skilled engineering graduates reflects the success of government initiatives in promoting education, research, and innovation, enabling India to take a leading position in the global technological landscape. **These efforts are key to achieving the vision of** *Viksit Bharat 2047*, **where India becomes a developed, technologically advanced, and self-reliant nation.**

India produces over 1.5 million engineering graduates annually

Source: indiaai.gov.in

Life and Legacy of Sir M. Visvesvaraya

National Engineers' Day

Remembering
Sir Mokshagundam Visvesvaraya
**on his Birth Anniversary**

From humble beginnings, Sir M. Visvesvaraya **rose to serve as the Diwan of Mysore and the President of the All-India Manufacturers' Organisation**. Awarded the **Bharat Ratna in 1955**, his visionary ideas continue to guide economic planners. His life remains an enduring inspiration, cementing his place as a monumental figure in India's history.

Notable Contributions of Sir M. Visvesvaraya

- **Innovative Flood Management Systems**: After the 1908 Musi River floods, Sir M. Visvesvaraya **designed reservoirs like Osman Sagar and Himayat Sagar and proposed systematic flood control solutions**. He also **implemented measures to protect Visakhapatnam port from sea erosion, thereby enhancing urban resilience**. Today, his reservoir-based flood management principles continue to guide modern water and disaster management projects.

- **Pioneering Dam Construction and Irrigation**: As Chief Engineer of Mysore, Sir M. Visvesvaraya built the **Krishna Raja Sagara (KRS) Dam** in 1932, creating **Asia's largest reservoir and transforming Mandya agriculture**. His **automatic sluice gates** improved water regulation at multiple dams, and he advanced irrigation and hydroelectric projects. These innovations continue to influence modern dam design and water management.

- **Influential Literary Works**: Sir M. Visvesvaraya's writings have had a lasting impact on India's development. *Planned Economy for India* promoted industrialization and infrastructure, *Reconstructing India* emphasized education and governance, and *Memoirs of My Working Life* chronicled his engineering achievements. **These works continue to guide modern economic and engineering strategies.**

Role of Engineers in Nation-Building

Engineers are the driving force behind India's transformation, **shaping the nation's critical infrastructure and leading knowledge-driven innovation. From constructing vital dams, roads, and buildings to advancing digital transformation**, they play a crucial role in building a modern nation.

Source: PIB
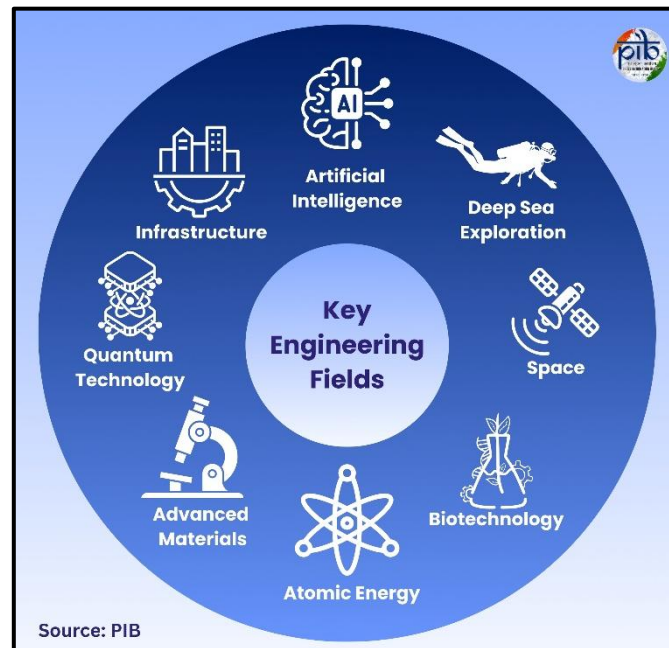
Infrastructure Development

Engineers, as architects of modern India, design and build critical infrastructure, including highways, expressways, metro rail networks, bridges, ports, and power generation systems. The Ministry of Road Transport and Highways highlights that projects like **Bharatmala Pariyojana, Sagarmala, PM Gati Shakti, and the Smart Cities Mission are transforming connectivity and logistics, with engineers driving their execution and innovation**. Inspired by pioneers like Sir M. Visvesvaraya, today's engineers continue his legacy of building a progressive nation.

Strategic Sectors

India's advancements in defence manufacturing, nuclear power, and space exploration are driven by engineering excellence. Engineers at the **Department of Space are pioneering AI and robotics for launch vehicle health monitoring, satellite data analysis, and interplanetary missions**, while those in the Department of Atomic Energy (DAE) and Defence Research and Development Organization (DRDO) develop technologies that bolster India's strategic capabilities.

Digital Transformation

Under the **Digital India initiative**, engineers have developed platforms like **Aadhaar, UPI, and DigiLocker**. By leveraging software engineering, cybersecurity, and data analytics, they have established India as a global leader in digital infrastructure and deep-tech innovation.

Government Initiatives Driving Engineering Excellence and Innovation

The Government of India is dedicated to promoting engineering excellence, research, and innovation through a robust ecosystem that nurtures talent and drives transformative growth.

Skill India Digital Hub

The Skill India Digital Hub government initiative, as India moves toward **Viksit Bharat 2047**, seeks to equip engineers with practical, industry-ready skills, preparing them for the challenges of a rapidly evolving technological landscape.

Atal Innovation Mission

The Atal Innovation Mission (AIM) aims to promote innovation and entrepreneurship across India through initiatives like **Atal Incubation Centres (AICs), fostering a robust startup ecosystem for students and engineers.** As of 18 December 2024, **3,556 startups have been incubated across 72 AICs, generating 41,965 jobs.**

Innovation in Science Pursuit for Inspired Research (INSPIRE)

The INSPIRE scheme plays a pivotal role in motivating youth to pursue research in cutting-edge science and technology. For engineers, it offers **pathways to advanced R&D in applied sciences, clean energy, semiconductors, space technology, and healthcare innovations**, thereby nurturing a robust pipeline of future engineers

Startup India

The Startup India initiative aims to nurture innovation and catalyze the growth of startups across the country. For engineers, it provides avenues to transform technological ideas into scalable enterprises in fields such as artificial intelligence, semiconductors, clean energy, space technology, and digital platforms. **The initiative's impact is evident in the rise of Department for Promotion of Industry and Internal Trade (DPIIT) recognized startups from around 500 in 2016 to 1,59,157 as of 15 January 2025.**

MERITE Scheme (Multidisciplinary Education and Research Improvement in Technical Education Scheme)

Under the **National Education Policy 2020 (NEP-2020)**, the government has allocated **₹4,200 crore** (for a period from 2025-26 to 2029-30) for **the MERITE scheme** to transform technical education and align it with the policy's vision for skill development and innovation. The scheme will be implemented in **275 technical institutions, including 175 engineering colleges and 100 polytechnics**. For engineers, MERITE provides modern labs, updated curricula, and multidisciplinary learning, preparing them to innovate in areas such as clean energy, AI, and advanced manufacturing, while strengthening India's technological leadership.

Premier Institutes Driving Engineering Excellence

The Indian government has strengthened the engineering ecosystem through premier institutions such as the **Indian Institutes of Technology (IITs), National Institutes of Technology (NITs), and Indian Institutes of Information Technology (IIITs)**, providing a

strong foundation for education and research. Complementing this, **All India Council for Technical Education (AICTE)** initiatives, like the **Research Promotion Scheme (RPS)**, equip engineers with modern tools and foster a research-driven environment, promoting innovation in both established and emerging technologies.

Deep-Tech Innovations

The **National Mission on Interdisciplinary Cyber-Physical Systems (NM-ICPS)**, implemented by the Department of Science and Technology, is a flagship government initiative promoting research, development, and innovation in deep technologies such as **Artificial Intelligence (AI), Robotics, Internet of Things (IoT), Cybersecurity, and FinTech. With 25 Technology Innovation Hubs established across premier institutions, the mission provides engineers with advanced skills, fosters entrepreneurship, and drives commercialization of technologies.** The mission has achieved significant milestones, including the **commercialization of 389 technologies/products, the generation of over 2,700 publications and intellectual property outputs,** thereby strengthening India's ecosystem for cutting-edge, indigenous deep-tech innovation.

Green Tech Innovations

India is rapidly advancing in renewable energy and green technologies, providing engineers with opportunities to drive innovation. Under initiatives like **PM Surya Ghar, PM-KUSUM, Solar Parks, and the National Green Hydrogen Mission**, engineers are designing and implementing **solar rooftop systems, large-scale solar parks, bioenergy, and green hydrogen projects. India now ranks 3rd globally in solar capacity and 4th in wind capacity, with renewable energy comprising 50% of total installed power.** Engineers are contributing to domestic manufacturing of solar PV cells, energy storage solutions, and pilot projects in agrivoltaics, floating solar, and hydrogen hubs, strengthening India's clean energy ecosystem.

Anusandhan National Research Foundation (ANRF)

The **Anusandhan National Research Foundation (ANRF)**, established under the ANRF Act, 2023, provides strategic direction for research, innovation, and entrepreneurship across natural sciences (including mathematical sciences), engineering, technology, environment, health, agriculture, and S&T interfaces of humanities and social sciences. Its programmes promote **industry–academia collaboration and mission-driven research with private sector participation.** Under the **Mission for Advancement in High-Impact Areas (MAHA)-EV, industry/PSU/start-up participation is mandatory with 10% cost sharing.** The Research, Development and Innovation (RDI) Scheme, with ₹1 lakh crore, offers long-term low-interest financing, while the **Advanced Research Grant (ARG) programme supports AI tool development in physics, chemistry, and biology.**

India's Engineering Leadership and Global Impact

India's engineering progress has achieved global recognition, driving technological leadership in fields such as artificial intelligence, semiconductor design, and quantum computing. These advancements are reflected in India's steadily rising position in the Global Innovation Index, underscoring its dynamic and progressive engineering ecosystem.
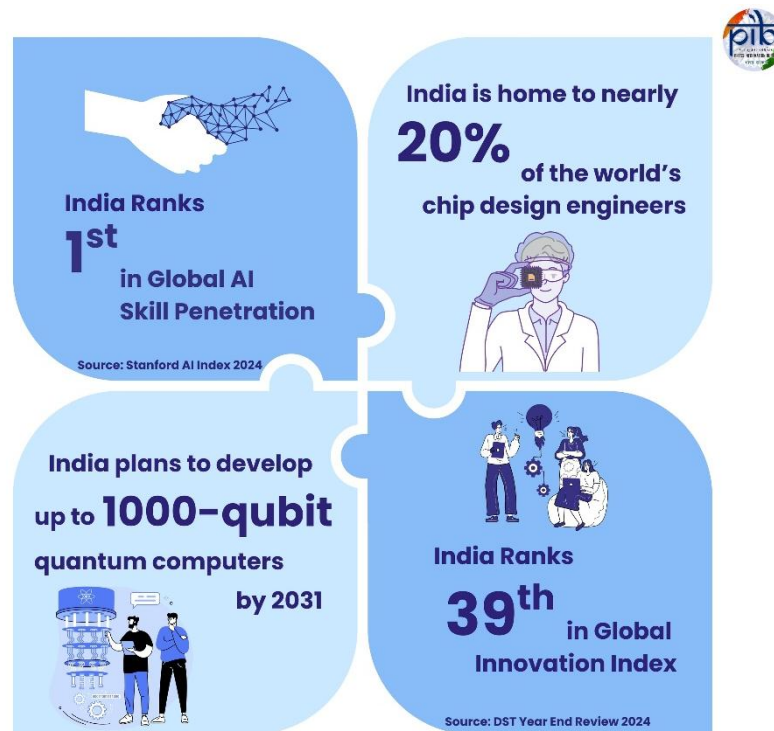
Conclusion

As India celebrates National Engineers' Day 2025, it is evident that engineers are not only the torchbearers of the nation's technological progress but also the architects of its future. From infrastructural advancements to deep-tech, their contributions continue to shape India's Techade. Supported by sustained government initiatives and a vibrant ecosystem of research and innovation, India's engineers are poised to drive the nation toward *Viksit Bharat 2047*, ensuring progress that is inclusive, sustainable, and transformative.

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Visvesvaraya Industrial and Technological Museum

https://vismuseum.gov.in/

AICTE

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SK/SA