KASE CHRONICLE

BUILDING INDIA'S SEMICONDUCTOR FUTURE: A ROADMAP FOR KERALA

CHARTING THE FUTURE OF SKILL DEVELOPMENT: KASE JOINS NCVET SOUTH ZONE WORKSHOP ON NCRF AND NSQF INTEGRATION

Kerala Academy for Skills Excellence (KASE) had the privilege of participating in the South-Zone Workshop organised by the National Council for Vocational Education and Training (NCVET), held on 24th September 2025 at Chennai Metro Rail Limited Auditorium.

The workshop was inaugurated by Shri K. Veera Raghava Rao IAS, Principal Secretary, Labour Welfare and Skill Development Department, Government of Tamil Nadu, with a special message delivered by Shri Jayant Chaudhary, Hon'ble Minister of State (Independent Charge), Ministry of Skill Development and Entrepreneurship, Government of India. The workshop brought together representatives from Tamil Nadu, Telangana, Andhra Pradesh, Kerala, Karnataka, Puducherry, and Lakshadweep to share best practices and strengthen collaborations in the skilling ecosystem.

Representing Kerala, the delegation from KASE included Shri Vinod T.V., Chief Operating Officer, KASE, Dr. Vinutha H.M., Senior Consultant, KASE, Smt. Lekshmi Priya R.K., Assistant Manager (Centrally Sponsored Schemes), KASE Shri Vinod T.V. delivered a presentation highlighting Kerala's model of skilling, focusing on State-level skilling initiatives and innovative partnerships. Alignment with national skilling frameworks, Integration of NCrF and NSQF, Challenges, best practices, and Kerala's roadmap for the future.The workshop served as a meaningful platform to exchange ideas, showcase Kerala's initiatives, and contribute to shaping a stronger, more inclusive skilling ecosystem for the nation.

ഡിജിറ്റൽ സാക്ഷരതയിൽ കുതിച്ചുചാട്ടം: കോഴിക്കോടും പാലക്കാടും ബേസിക് കമ്പ്യൂട്ടർ അവബോധ ക്ലാസുകൾ പൂർത്തിയാക്കി

സംസ്ഥാനത്തെ ഡിജിറ്റൽ സാക്ഷരതാ ലക്ഷ്യങ്ങൾ പൂർണ്ണമാക്കുന്നതിന്റെ ഭാഗമായി, **കോഴിക്കോട്, പാലക്കാട് ജില്ലാ നൈപുണ്യ വികസന കേന്ദ്രങ്ങൾ** അഞ്ച് ദിവസത്തെ **ബേസിക് കമ്പ്യൂട്ടർ അവയർനസ് ക്ലാസുകൾ** വിജയകരമായി സംഘടിപ്പിച്ചു. അടിസ്ഥാന കമ്പ്യൂട്ടർ പരിജ്ഞാനം നൽകുക എന്ന ലക്ഷ്യത്തോടെ നടത്തിയ ഈ പരിശീലന പരിപാടിയിലൂടെ ഇരു ജില്ലകളിലുമായി **ആകെ 100 പേർക്ക് (കോഴിക്കോട്: 6 ബാച്ചുകളിലായി 52 പേർ; പാലക്കാട്: 5 ബാച്ചുകളിലായി 48 പേർ)** പരിശീലനം ലഭിച്ചു. കോഴിക്കോട് ജില്ലയിലെ കോർപ്പറേഷൻ പരിധിയിലെയും വിവിധ പഞ്ചായത്തുകളിലെയും സ്ത്രീകളും പുരുഷന്മാരും പ്രസ്തുത ക്ലാസുകളിൽ പങ്കെടുത്തു. ജോലിക്കുപോകുന്നവർക്കും സ്കൂൾ അഥവാ കോളേജ് വിദ്യാർഥികൾക്കുമായി

പ്രത്യേക സാറ്റർഡേ ബാച്ച് സംഘടിപ്പിച്ചു. കുടുംബശ്രീ സി.ഡി.എസ്, സോഷ്യൽ മീഡിയ, ജനസേവാ കേന്ദ്രങ്ങൾ, റെസിഡൻസ് അസോസിയേഷനുകൾ എന്നിവയൂൾപ്പെടെയുള്ള സംവിധാന ങ്ങളിലൂടെയാണ് പരിശീലനാർഥികളെ കണ്ടെത്തിയത്. പാലക്കാട് ജില്ലയിൽ തൃത്താല ബ്ലോക്കിലെ വിവിധ പഞ്ചായത്തുകളിലെ സ്ത്രീകളും പുരുഷന്മാരും ക്ലാസുകളിൽ സജീവമായി പങ്കെടുത്തു. കോഴിക്കോട് ജില്ലാ നൈപുണ്യ വികസന കേന്ദ്രത്തിലെ **ബിസിനസ് ഡെവലപ്മെന്റ് എക്സിക്യൂട്ടീവ്** ശ്രീമതി സൂര്യയും പാലക്കാട് ജില്ലാ നൈപുണ്യ വികസന കേന്ദ്രത്തിലെ ബി.ഡി.ഇ സേതുലക്ഷ്മിയുമാണ് ക്ലാസുകൾ കൈകാര്യം ചെയ്തത്. ഈ ദൗത്യത്തിലൂടെ, പ്രാദേശിക സമൂഹങ്ങളെ ഡിജിറ്റൽ യുഗത്തിന് സജ്ജമാക്കാ നുള്ള നൈപുണ്യ വികസന കേന്ദ്രങ്ങളുടെ പ്രതിബദ്ധത കൂടുതൽ ശക്തിപ്പെടുത്തുന്നു.

STRENGTHENING INDO-GERMAN ECONOMIC TIES:
## GERMAN EMBASSY OFFICIAL VISITS KASE

The Kerala Academy for Skills Excellence (KASE) headquarters in Trivandrum was honored to host a visit from Dr. Simon H. Perker, First Secretary for Economic and Global Affairs at the German Embassy, New Delhi, on September 18th. Dr. Perker engaged in productive and forward-looking discussions with Shri Sufiyan Ahmed IAS, Managing Director of KASE; Shri Vinod T.V., Chief Operating Officer; Dr. Syed Ibrahim, Honorary Consul of the Federal Republic of Germany in Kerala; and other senior officials. The primary agenda focused on deepening economic cooperation between Kerala and Germany, with particular emphasis on two critical areas. These included establishing streamlined processes for ethical migration, ensuring safe and regulated pathways for Kerala's skilled workforceto Germany, and developing strategic collaborations to enhance skilling initiatives at KASE. The goal of these initiatives is to tailor KASE's training programs to precisely meet the standards and demands of the German labour market, thereby guaranteeing a high-quality talent pool. This significant engagement represents a major step forward in solidifying partnerships for mutual skill development and economic exchange. KASE is committed to moving these discussions into concrete action plans that will benefit both regions.

BUILDING INDIA's SEMICONDUCTOR WORKFORCE
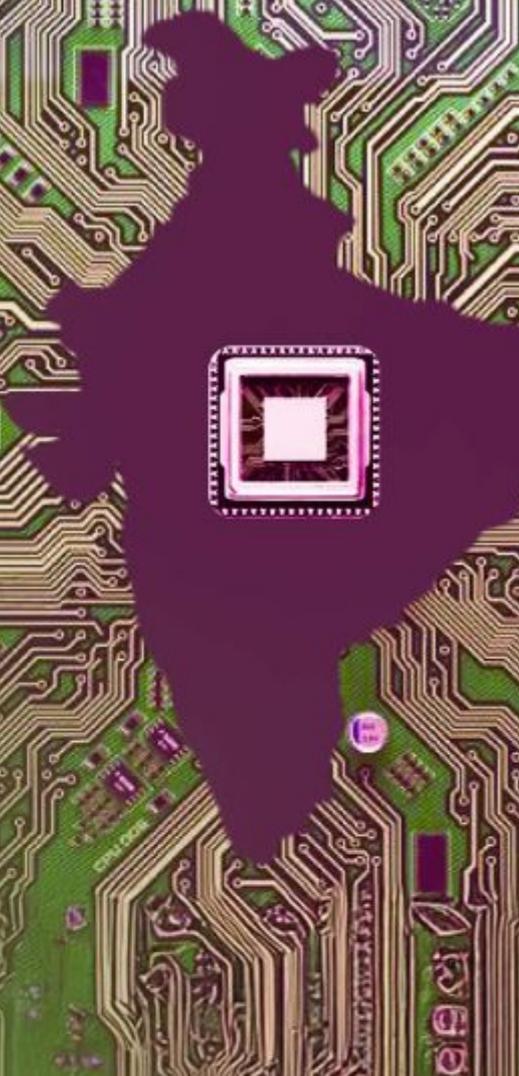
India's ambition to become a global semiconductor hub has gained significant momentum in recent years. With digitalisation, 5G rollout, electric mobility, and AI adoption driving unprecedented chip demand, semiconductors are no longer just an industry—they are the backbone of the nation's economic and strategic future. Recognising this, the Government of India launched the India Semiconductor Mission (ISM) with an outlay of ₹76,000 crore, setting the stage for large-scale investment in chip design, fabrication, assembly, and testing.

## Policy Push & Training Milestones

To prepare a strong talent pipeline, multiple skilling programmes have been rolled out:

- skilling programmes have been rolled out: 60,000 students trained in semiconductor - related courses as of August 2025.

- 278 colleges equipped with Electronic Design Automation (EDA) tools for chip design.

- Partnerships with Lam Research, IBM, Purdue University, and IISc to enhance curriculum, labs, and R&D.

- The Telecom Sector Skill Council's "Semicon Academy" offers training in VLSI and chip design.

Industry Trends & Opportunities

India already contributes ~20% of the world's chip design engineers, making it an attractive destination for global companies. Domestic semiconductor consumption is projected to exceed USD 120 billion by 2030. New fabrication and packaging facilities in Gujarat, Assam, Odisha, Punjab, and Andhra Pradesh—including a Foxconn-HCL project in Assam—signal a growing manufacturing base. Meanwhile, the recent **SEMICON India 2025** event brought
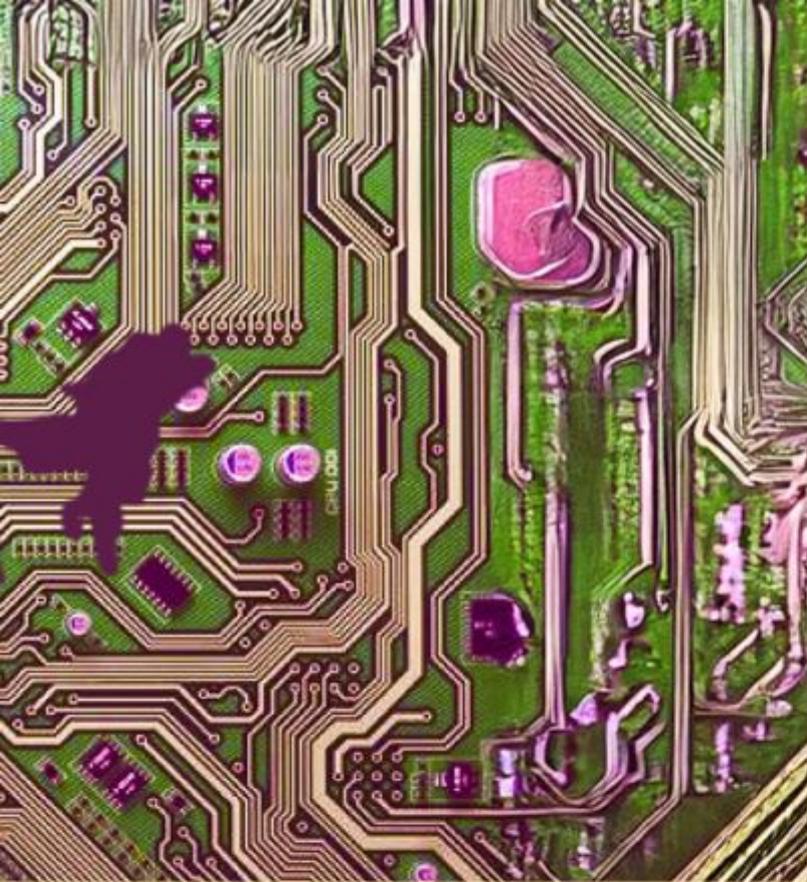
together over 350 companies from 33 countries, underlining international confidence in India's semiconductor ecosystem.

Skilling Gaps & Challenges

Despite progress, the country faces a projected shortage of 1 million skilled workers by 2032. Key challenges include:

- Limited access to advanced labs and clean rooms in many institutions.
- Misalignment between academic curriculum and industry needs.
- Concentration of training in metros, leaving tier-2/3 cities underrepresented.
- High infrastructure costs for testing and packaging training facilities.

The Road Ahead

For India to fully realise its semiconductor potential, scaling industry-ready skilling is critical. Expanding access to labs, strengthening industry–academia collaboration, and ensuring regional spread of training will be essential. With sustained government push and private sector partnerships, India can not only meet domestic demand but also emerge as a global talent powerhouse in semiconductors-turning its demographic dividend into a strategic advantage.

SKILL TERM

VLSI Design (Very Large Scale Integration Design) : VLSI (Very Large Scale Integration) Design involves creating integrated circuits by combining thousands to millions of transistors onto a single chip, covering design, layout, verification, and optimization for devices like computers, smartphones, and automotive electronics. Upskilling in VLSI focuses on CAD tools, logic design, verification methods, and embedded systems, enabling engineers to drive chip innovation and support domestic semiconductor manufacturing. As India expands its design and manufacturing capabilities, skilled VLSI designers play a crucial role in bridging the talent gap, meeting industry demand, and advancing technological sovereignty in the semiconductor sector.
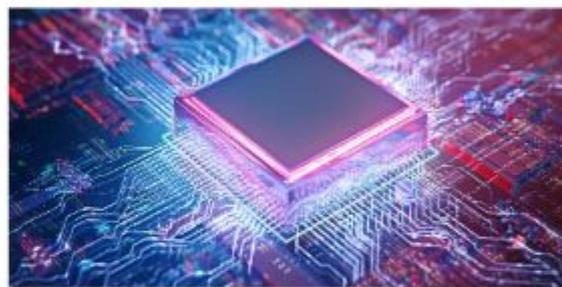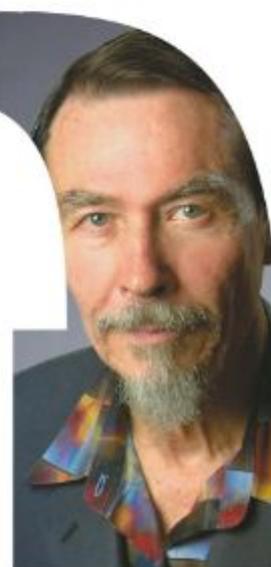

Sector: Semiconductor and Electronics Sector

SKILL THOUGHT

"Design is the way you add value to silicon, and not just fabrication."

Carver Mead,
Pioneer in VLSI Chips and Neural Networks

LAUNCHING OF THE THIRD BATCH OF FULL STACK DEVELOPMENT AT DSDC KOLLAM

The District Skill Development Centre (DSDC), Kollam, successfully launched the third batch of its Full Stack Development Programme in collaboration with Edunet foundation on October 22, 2025. The programme is a CSR initiative of Ernst and Young(EY).

Prior to the launch, the Centre conducted a meticulous selection process to ensure high-quality student engagement. This included an orientation held on September 9, 2025, followed by two critical screening tests administered on September 18 and October 10.

The new batch comprises 25 students who are now undergoing intensive training. The programme is designed to equip them with cutting-edge skills in both front-end and back-end development, preparing them for promising careers in the technology sector.

This initiative reinforces DSDC Kollam's commitment to delivering advanced, industry-relevant training and contributing significantly to the growth of skilled IT professionals in the region.

BUILDING INDIA's SEMICONDUCTOR FUTURE: A ROADMAP FOR KERALA

MADE IN INDIA
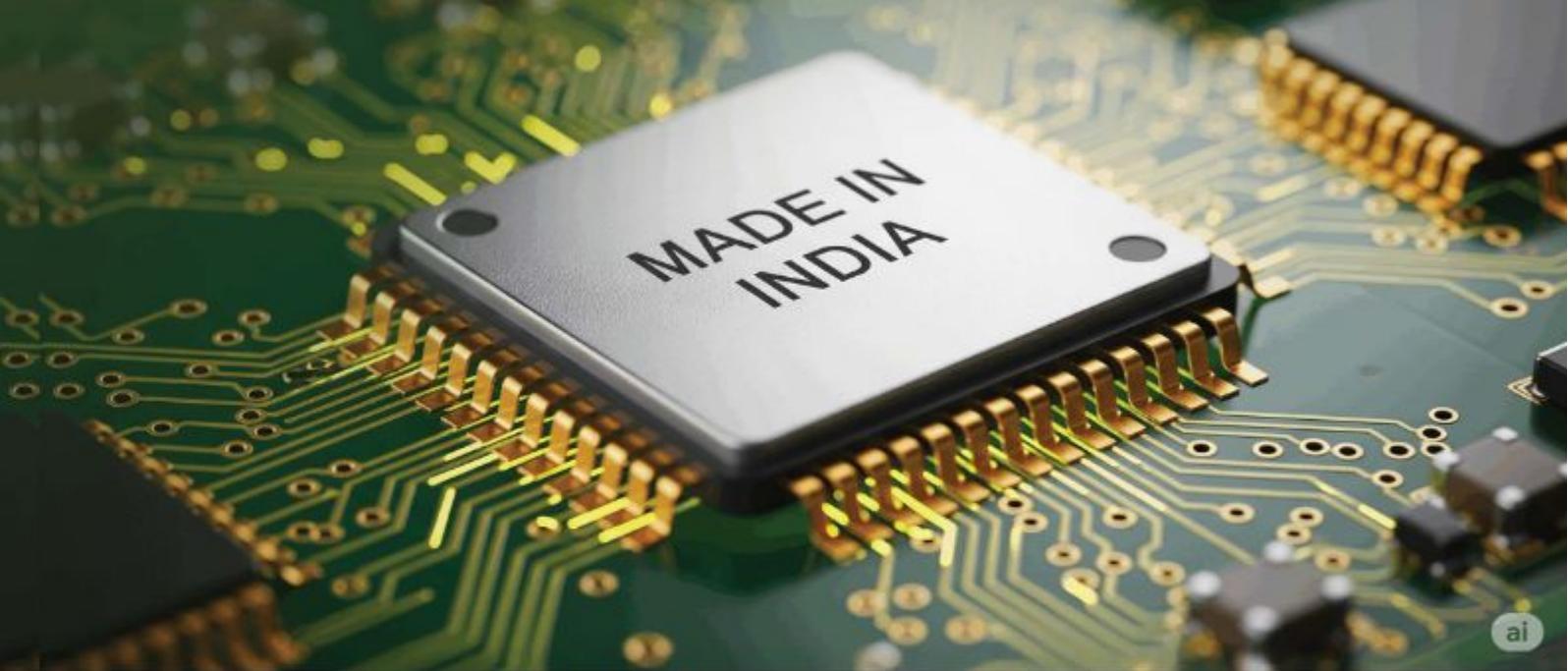
The Global Semiconductor Landscape

Semiconductors, often called the "brains" of modern electronics, are the invisible engines that power everything from smartphones and laptops to electric vehicles and satellites. Their ability to act as both conductors and insulators makes them the cornerstone of today's digital economy. The semiconductor industry has become one of the world's most dynamic and competitive sectors, with a global value chain that spans design, fabrication, assembly, and testing — and involves some of the most advanced manufacturing processes known to humankind. According to the McKinsey Global Institute's report "The Next Big Arenas of Competition", semiconductors are projected to be among the top future industries by 2040, with

expected revenues between USD 1.7 to 2.4 trillion and profit margins as high as 25%. The industry has grown rapidly over the past two decades, with revenues expanding at a compound annual growth rate (CAGR) of about 7% between 2005 and 2020. Major players like TSMC, Intel, Samsung, Nvidia, and ASML dominate different segments of the semiconductor supply chain, and the surge in AI, robotics, 5G, and electric mobility has only increased the demand for advanced chips.

The COVID-19 pandemic exposed the fragility of the global semiconductor supply chain, with shortages affecting automobile, electronics, and healthcare sectors alike. This disruption accelerated a global race toward semiconductor self-reliance, prompting governments and companies to diversify supply chains and invest in domestic chip production.

India's Semiconductor Revolution

India has entered this global semiconductor race with unprecedented commitment and policy focus. The India Semiconductor Mission (ISM) - launched under the Ministry of Electronics and Information Technology (Meity) — aims to make India a global hub for semiconductor manufacturing, design, and research. With a total outlay of ₹76,000 crore, the programme supports fabrication units, assembly and testing facilities, and design-linked initiatives across the country.

As of August 2025, India has approved 10 semiconductor projects across six states, amounting to ₹1.6 lakh crore in cumulative investments. The country's first end-to-end OSAT (Outsourced Semiconductor Assembly and Test) pilot line was inaugurated at Sanand, Gujarat, under CG Power, and similar facilities are being developed in Assam, Andhra Pradesh, and Tamil Nadu. Another major initiative, SEMICON India, brings together over 300 global exhibitors from 18 countries, signalling India's growing reputation as a trusted partner in the global chip supply chain.

Prime Minister Narendra Modi recently highlighted that India contributes 20% of the global semiconductor design talent, with over 125,000 engineers working in chip design and development. Companies like Intel, Texas Instruments, Qualcomm, Nvidia, AMD, and Synopsys have extensive R&D centres in India. Synopsys alone employs over 5,500 professionals and collaborates with 400 universities through its Chips to Startup (C2S) programme to train students in VLSI and embedded system design. Similarly, AMD has announced a $400 million investment to build its largest global design centre in Bengaluru, creating 3,000 new engineering roles.

In addition to design, India is making steady progress in manufacturing. Micron Technology has begun work on its ₹22,500 crore ATMP (Assembly, Test, Marking, and Packaging) facility in Gujarat, while Tata Electronics is setting up a ₹27,000 crore semiconductor assembly andtesting unit in Assam, expected to generate 27,000 direct and indirect jobs. These projects mark a decisive step toward developing a full semiconductor value chain in India.

Building a Skilled Workforce

While infrastructure is expanding, the real challenge lies in developing a skilled workforce capable of sustaining this industry. Studies indicate a global shortage of one million semiconductor professionals by 2032, and India has the potential to bridge a large portion of this gap. However, less than 3% of India's 1.5 million annual engineering graduates are currently "semiconductor-ready."

To address this, the government has launched multiple skilling programmes:

- Chips to Startup (C2S) – aims to train 85,000 engineers in VLSI and embedded systems over five years across 120 academic institutions.
- VLSI Design and Technology Curriculum (AICTE) – adopted by over 625 colleges, with 16,300 students enrolled in diploma and degree courses.
- National Programme on AI (NPAI) and Design Linked Incentive (DLI) Scheme – encourage startups and MSMEs to build indigenous chip designs and intellectual property.
- Lam Research's Semiverse Solutions initiative plans to train 60,000 Indian engineers through a virtual fabrication platform in collaboration with IISc Bengaluru.

These efforts are complemented by collaborations with industry leaders such as Applied Materials, which is investing $400 million in an engineering centre in India, and Synopsys, which supports skill development through partnerships with premier institutions like IIT Bombay and IISc Bengaluru.

Career opportunities in this sector are diverse.

- Entry-level roles include Assembly and Testing Operators for diploma holders in electronics and instrumentation.
- Design and Verification Engineers are in high demand for B.Tech/BE graduates in ECE, EEE, and CSE.
- With experience and upskilling, professionals can advance to roles like Chip Architects, Process Engineers, and Packaging Specialists.

India's semiconductor skilling ecosystem is also being mapped under the National Skills Qualification Framework (NSQF), with more than 617 future-skills qualifications, including 59 in Electronic and VLSI Design and 50 in EV/Automotive electronics.

Kerala's Opportunity: From Potential to Partnership

Kerala, despite having a strong base of technically qualified youth, has so far remained on the sidelines of India's semiconductor journey. However, the state government has begun exploring possibilities to establish semiconductor parks and electronics manufacturing units. A feasibility study involving Keltron, CDAC, VSSC, and the Electronics and Semiconductor Association proposed setting up a semiconductor assembly and testing facility, PCB production unit, and a design and training ecosystem - with an estimated investment of ₹1,000 crore. The first facilities are planned in Kochi and Palakkad, expected to generate around 4,000 jobs.

Kerala can learn from other states like Gujarat, Karnataka, and Tamil Nadu, which have adopted industry-academia collaboration models and fiscal incentive policies to attract semiconductor investment. With its existing strengths in electronics, IT, and education, Kerala is ideally positioned to become a design and testing hub supporting national ATMP facilities through remote Electronic Design Automation (EDA) work and industry internships.Institutions such as C-DAC Thiruvananthapuram, Keltron, and Tata Elxsi already possess capabilities in VLSI design, embedded systems, and electronics manufacturing. Partnering these with KASE's skilling infrastructure could create a Kerala Semiconductor Skilling Consortium, aligning with the India Semiconductor Mission's talent pipeline.

The Way Forward for KASE

As the State Skill Development Mission and State Skill Secretariat, KASE has a vital role in ensuring that Kerala is not left behind in this emerging industry. Some actionable steps include: Launching specialized NSQF-aligned semi conductor skilling programmes in collaboration with CDAC, Keltron, and industry partners. Creating a Centre of Excellence (CoE) for semiconductor skilling and research, focusing on ATMP operations, cleanroom protocols, and VLSI design. Recognised trainer programmes to train trainers in semiconductor fabrication and design technologies. Integrating semiconductor-related short-term courses within existing polytechnics, engineering colleges, and district skill centres. Facilitating internships and exchange programmes with national ATMP facilities and global semiconductor firms. Through these initiatives, KASE can transform Kerala's technically educated youth into globally competitive semiconductor professionals, contributing not only to India's national mission but also to the state's knowledge-driven economy.

Conclusion

The semiconductor industry represents the next frontier of industrial growth - one that combines innovation, high-value manufacturing, and global collaboration. For India, it is both an opportunity and a necessity to build a resilient and self-reliant digital economy. For Kerala, it is a moment to act - to invest in human capital, forge academic-industry linkages, and position itself as a trusted talent partner in the national semiconductor mission. KASE's proactive involvement can ensure that Kerala's skilled workforce becomes the state's biggest export to this booming global industry. In doing so, KASE can help Kerala not just participate in India's semiconductor revolution, but help lead it - one skilled engineer at a time.

Department of Labour and Skills
Government of Kerala

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